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Junos<sup>®</sup> OS

## Chassis-Level Feature Guide



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*Junos® OS Chassis-Level Feature Guide*

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# About the Documentation

- Documentation and Release Notes on page xxxiii
- Using the Examples in This Manual on page xxxiii
- Documentation Conventions on page xxxv
- Documentation Feedback on page xxxvii
- Requesting Technical Support on page xxxvii

## Documentation and Release Notes

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To obtain the most current version of all Juniper Networks® technical documentation, see the product documentation page on the Juniper Networks website at <https://www.juniper.net/documentation/>.

If the information in the latest release notes differs from the information in the documentation, follow the product Release Notes.

Juniper Networks Books publishes books by Juniper Networks engineers and subject matter experts. These books go beyond the technical documentation to explore the nuances of network architecture, deployment, and administration. The current list can be viewed at <https://www.juniper.net/books>.

## Using the Examples in This Manual

---

If you want to use the examples in this manual, you can use the **load merge** or the **load merge relative** command. These commands cause the software to merge the incoming configuration into the current candidate configuration. The example does not become active until you commit the candidate configuration.

If the example configuration contains the top level of the hierarchy (or multiple hierarchies), the example is a *full example*. In this case, use the **load merge** command.

If the example configuration does not start at the top level of the hierarchy, the example is a *snippet*. In this case, use the **load merge relative** command. These procedures are described in the following sections.

## Merging a Full Example

To merge a full example, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration example into a text file, save the file with a name, and copy the file to a directory on your routing platform.

For example, copy the following configuration to a file and name the file **ex-script.conf**. Copy the **ex-script.conf** file to the **/var/tmp** directory on your routing platform.

```
system {
  scripts {
    commit {
      file ex-script.xml;
    }
  }
}
interfaces {
  fxp0 {
    disable;
    unit 0 {
      family inet {
        address 10.0.0.1/24;
      }
    }
  }
}
```

2. Merge the contents of the file into your routing platform configuration by issuing the **load merge** configuration mode command:

```
[edit]
user@host# load merge /var/tmp/ex-script.conf
load complete
```

## Merging a Snippet

To merge a snippet, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration snippet into a text file, save the file with a name, and copy the file to a directory on your routing platform.

For example, copy the following snippet to a file and name the file **ex-script-snippet.conf**. Copy the **ex-script-snippet.conf** file to the **/var/tmp** directory on your routing platform.

```
commit {
  file ex-script-snippet.xml; }
```

2. Move to the hierarchy level that is relevant for this snippet by issuing the following configuration mode command:

```
[edit]
user@host# edit system scripts
[edit system scripts]
```

3. Merge the contents of the file into your routing platform configuration by issuing the **load merge relative** configuration mode command:

```
[edit system scripts]
user@host# load merge relative /var/tmp/ex-script-snippet.conf
load complete
```

For more information about the **load** command, see [CLI Explorer](#).

## Documentation Conventions

Table 1 on page xxxv defines notice icons used in this guide.

*Table 1: Notice Icons*

Icon	Meaning	Description
	Informational note	Indicates important features or instructions.
	Caution	Indicates a situation that might result in loss of data or hardware damage.
	Warning	Alerts you to the risk of personal injury or death.
	Laser warning	Alerts you to the risk of personal injury from a laser.
	Tip	Indicates helpful information.
	Best practice	Alerts you to a recommended use or implementation.

Table 2 on page xxxvi defines the text and syntax conventions used in this guide.

Table 2: Text and Syntax Conventions

Convention	Description	Examples
<b>Bold text like this</b>	Represents text that you type.	To enter configuration mode, type the <b>configure</b> command:  user@host> <b>configure</b>
Fixed-width text like this	Represents output that appears on the terminal screen.	user@host> <b>show chassis alarms</b>  No alarms currently active
<i>Italic text like this</i>	<ul style="list-style-type: none"> <li>Introduces or emphasizes important new terms.</li> <li>Identifies guide names.</li> <li>Identifies RFC and Internet draft titles.</li> </ul>	<ul style="list-style-type: none"> <li>A policy <i>term</i> is a named structure that defines match conditions and actions.</li> <li><i>Junos OS CLI User Guide</i></li> <li>RFC 1997, <i>BGP Communities Attribute</i></li> </ul>
<i>Italic text like this</i>	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name:  [edit] root@# <b>set system domain-name</b> <i>domain-name</i>
Text like this	Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.	<ul style="list-style-type: none"> <li>To configure a stub area, include the <b>stub</b> statement at the [edit protocols ospf area area-id] hierarchy level.</li> <li>The console port is labeled <b>CONSOLE</b>.</li> </ul>
< > (angle brackets)	Encloses optional keywords or variables.	<b>stub</b> <default-metric <i>metric</i> >;
(pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	<b>broadcast</b>   <b>multicast</b>  ( <i>string1</i>   <i>string2</i>   <i>string3</i> )
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	<b>rsvp { # Required for dynamic MPLS only</b>
[ ] (square brackets)	Encloses a variable for which you can substitute one or more values.	<b>community name members</b> [ <i>community-ids</i> ]
Indentation and braces ( { } )	Identifies a level in the configuration hierarchy.	[edit] routing-options { static { route default { nexthop <i>address</i> ; retain; } } }
;(semicolon)	Identifies a leaf statement at a configuration hierarchy level.	



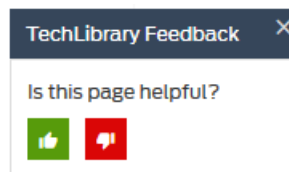
Table 2: Text and Syntax Conventions (continued)

Convention	Description	Examples
<b>GUI Conventions</b>		
<b>Bold text like this</b>	Represents graphical user interface (GUI) items you click or select.	<ul style="list-style-type: none"> <li>In the Logical Interfaces box, select <b>All Interfaces</b>.</li> <li>To cancel the configuration, click <b>Cancel</b>.</li> </ul>
> (bold right angle bracket)	Separates levels in a hierarchy of menu selections.	In the configuration editor hierarchy, select <b>Protocols&gt;Ospf</b> .

## Documentation Feedback

We encourage you to provide feedback so that we can improve our documentation. You can use either of the following methods:

- Online feedback system—Click TechLibrary Feedback, on the lower right of any page on the [Juniper Networks TechLibrary](#) site, and do one of the following:



- Click the thumbs-up icon if the information on the page was helpful to you.
- Click the thumbs-down icon if the information on the page was not helpful to you or if you have suggestions for improvement, and use the pop-up form to provide feedback.
- E-mail—Send your comments to [techpubs-comments@juniper.net](mailto:techpubs-comments@juniper.net). Include the document or topic name, URL or page number, and software version (if applicable).

## Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or Partner Support Service support contract, or are covered under warranty, and need post-sales technical support, you can access our tools and resources online or open a case with JTAC.

- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the *JTAC User Guide* located at <https://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf>.
- Product warranties—For product warranty information, visit <https://www.juniper.net/support/warranty/>.

- JTAC hours of operation—The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

## Self-Help Online Tools and Resources

For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- Find CSC offerings: <https://www.juniper.net/customers/support/>
- Search for known bugs: <https://prsearch.juniper.net/>
- Find product documentation: <https://www.juniper.net/documentation/>
- Find solutions and answer questions using our Knowledge Base: <https://kb.juniper.net/>
- Download the latest versions of software and review release notes: <https://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications: <https://kb.juniper.net/InfoCenter/>
- Join and participate in the Juniper Networks Community Forum: <https://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Management tool: <https://www.juniper.net/cm/>

To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool: <https://entitlementsearch.juniper.net/entitlementsearch/>

## Opening a Case with JTAC

You can open a case with JTAC on the Web or by telephone.

- Use the Case Management tool in the CSC at <https://www.juniper.net/cm/>.
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

For international or direct-dial options in countries without toll-free numbers, see <https://www.juniper.net/support/requesting-support.html>.

## PART 1

# Overview

- [Chassis-Level Configuration Overview on page 3](#)
- [MX Series MPCs Overview on page 5](#)
- [Line Card Interoperability Overview on page 79](#)
- [Configuring Power Management on page 95](#)
- [Fabric Management Overview on page 115](#)
- [Configuring Rate Selectability on page 175](#)
- [Port Mirroring Instances Configuration Overview on page 227](#)
- [Configuring Clocking and Synchronization on page 231](#)
- [Configuring Network Services Mode on page 361](#)



# Chassis-Level Configuration Overview

- [Chassis-Level Features Overview on page 3](#)

## Chassis-Level Features Overview

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The Junos Software enables you to configure several properties of the router and many PIC-level features at the **[edit chassis]** hierarchy level. Some of the features are specific to M Series, MX Series, J Series, or T Series routers, while some others are common across all routers.

To configure router chassis properties, you can include the configuration statements available at the **[edit chassis]** hierarchy level.



**NOTE:** Statements at the **[edit chassis redundancy]** hierarchy level are described in the *JUNOS High Availability Configuration Guide*.



**NOTE:** The configuration statements at the **[edit chassis lcc]** hierarchy level apply only to a routing matrix based on a TX Matrix router or a TX Matrix Plus router. For information about a routing matrix composed of a TX Matrix router and T640 routers, see “[TX Matrix Router and T640 Router Configuration Overview](#)” on [page 373](#) and the *TX Matrix Router Hardware Guide*. For information about a routing matrix composed of a TX Matrix Plus router and T1600 or T4000 routers, see “[TX Matrix Plus Router Configuration Overview](#)” on [page 397](#) and the *TX Matrix Plus Router Hardware Guide*.



**NOTE:** The sanity-poll configuration statements at the **[edit chassis fpc slot-number]** hierarchy level apply only to T Series routers. You can also configure sanity-poll for routing matrix based on a TX Matrix router or TX Matrix Plus router at the hierarchy level **[edit chassis lcc number fpc number]**.



## CHAPTER 2

# MX Series MPCs Overview

- [16-Port 10-Gigabit Ethernet MPC on MX Series Routers \(16x10GE 3D MPC\) Overview on page 6](#)
- [MPC1 on MX Series Routers Overview on page 7](#)
- [Understanding Interface Naming Conventions for MPC1 on page 8](#)
- [MPC2 on MX Series Routers Overview on page 12](#)
- [Understanding Interface Naming Conventions for MPC2 on page 14](#)
- [Tunnel Interfaces on MX Series Routers with MPC1 and MPC2 on page 20](#)
- [Understanding Interface Naming Conventions for MIC-MACSEC-20GE on page 22](#)
- [MPC3E on MX Series Routers Overview on page 23](#)
- [MPC4E on MX Series Routers Overview on page 27](#)
- [MPC5E on MX Series Routers Overview on page 29](#)
- [MPC6E on MX Series Routers Overview on page 31](#)
- [MPC7E \(Multi-Rate\) on MX Series Routers Overview on page 33](#)
- [MPC7E 10G on MX Series Routers Overview on page 35](#)
- [MPC8E on MX Series Routers Overview on page 37](#)
- [MPC9E on MX Series Routers Overview on page 39](#)
- [Tunnel Interfaces on MX Series Routers with MPC7E-10G, MPC7E-MRATE, MX2K-MPC8E, and MX2K-MPC9E on page 41](#)
- [MX10003 MPC on MX10003 Router Overview on page 43](#)
- [JNP10K-LC2101 MPC on MX10008 Routers Overview on page 44](#)
- [MX204 Router Overview on page 45](#)
- [Flexible Queuing Mode Overview on page 45](#)
- [Upgrading non-HQoS MPCs to Support Flexible Queuing on page 46](#)
- [Disabling Flexible Queuing for non-HQoS MPCs to Optimize Power Utilization on page 47](#)
- [Understanding the Hyper Mode Feature on Enhanced MPCs for MX Series Routers and EX9200 Switches on page 48](#)
- [Configuring Hyper Mode on Enhanced MPCs to Speed Up Packet Processing on page 50](#)
- [Unsupported Features and CLI Commands When Hyper Mode Is Enabled on page 51](#)
- [License Modes for Enhanced MPCs Overview on page 54](#)

- [Configuring the License Mode for Specific Enhanced MPCs on MX Series Routers on page 55](#)
- [Example: Configuring the License Mode for MPC5E on page 56](#)
- [Configuring the Number of Active Ports on 16-Port MPCs of MX Series Routers on page 61](#)
- [Configuring Tunnel Interfaces on an MX Series Router with a 16x10GE 3D MPC on page 62](#)
- [Configuring Tunnel Interfaces on MX Series Routers with the MPC3E on page 63](#)
- [Example: Configuring Tunnel Interfaces on the MPC3E on page 64](#)
- [Configuring Tunnel Interfaces on MX Series Routers with MPC4E on page 66](#)
- [Configuring Tunnel Interfaces on MX Series Routers with MPC7E-MRATE/MPC7E-10G on page 67](#)
- [Configuring Tunnel Interfaces on MX Series Routers with MX2K-MPC8E on page 68](#)
- [Configuring Tunnel Interfaces on MX Series Routers with MX2K-MPC9E on page 69](#)
- [Remote Port Identification using LEDs for Cabling Assistance on page 70](#)
- [MPC and MIC Lane LED Scheme Overview on page 71](#)
- [MX204 LED Scheme Overview on page 74](#)
- [Guidelines for Identifying Active PICs on MPC5E \(MPC5E-40G10G\) on page 75](#)

## **16-Port 10-Gigabit Ethernet MPC on MX Series Routers (16x10GE 3D MPC) Overview**

In Junos OS Release 10.1 and later, MX960, MX480, and MX240 routers support the 16-port 10-Gigabit Ethernet MPC (16x10GE 3D MPC) with model numbers MPC-3D-16XGE-SFPP-R-B and MPC-3D-16XGE-SFPP. This MPC provides scalability in bandwidth, subscribers, and services capabilities of the routers.

The following are some of the key features of the 16x10GE 3D MPC:

- Contains 16 built-in 10-Gigabit Ethernet ports in groups of four each. It does not contain separate slots for Modular Interface Cards (MICs).
- Supports LAN-PHY mode with the following throughput:
  - 120 Gbps on Junos release 11.3 and earlier (SCB)
  - 160 Gbps on Junos release 11.4 and later (SCBE)
  - 160 Gbps on Junos release 13.3 and later (SCBE2)



**NOTE:** The 16x10GE 3D MPC does not support WAN-PHY mode.

---

- Supports small form-factor pluggable transceivers of the SFP+ standard. For a list of supported SFPs, see the [MX Series Interface Module Reference](#).
- Supports an effective line rate of twelve 10-Gigabit Ethernet ports. If all sixteen 10-Gigabit Ethernet ports are used, the line card is oversubscribed in the ratio of 4:3.



- Supports intelligent oversubscription services.
- Supports one full-duplex 10-Gigabit Ethernet tunnel interface for each Packet Forwarding Engine.

For information about the supported and unsupported Junos OS features for this MPC, see “Protocols and Applications Supported by MX Series MPCs” in the [MX Series Interface Module Reference](#).

#### Related Documentation

- [16x10GE MPC](#)
- [MX Series Interface Module Reference](#).
- [Configuring the Number of Active Ports on 16-Port MPCs of MX Series Routers on page 61](#)
- [Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 366](#)
- [Tunnel Interface Configuration on MX Series Routers Overview](#)

## MPC1 on MX Series Routers Overview

In Junos OS Release 10.2 and later, MX960, MX480, MX240, MX2008, MX2010, and MX2020 routers support the Modular Port Concentrator (MPC) MPC1. This MPC provides scalability in bandwidth, subscribers, and services capabilities of the routers.

The MPC interoperates with existing MX Series line cards, including Dense Port Concentrators (DPCs) and Modular Port Concentrators (MPCs).

Starting in JunosOS Release 18.3R1, on MX240, MX480, and MX960 routers, the MIC-MACSEC-20GE with SFP/SFP+ ports are supported on MPC1 line card.

The MIC-MACSEC-20GE includes MACSEC-enabled ports with 256-bit encryption (GCM-AES-256 and GCM-AES-XPB-256). For more information, refer to “[Understanding Interface Naming Conventions for MIC-MACSEC-20GE](#)” on page 22.

MPC Name	MPC Model Number	First Junos OS Release on MX240, MX480, and MX960 Routers	First Junos OS Release on MX2008 Routers	First Junos OS Release on MX2010 Routers	First Junos OS Release on MX2020 Routers
<i>MPC1</i>	MX-MPC1-3D	10.2	15.1F7	12.3	12.3
<i>MPC1E</i>	MX-MPC1E-3D	11.2R4	15.1F7	12.3	12.3
<i>MPC1 Q</i>	MX-MPC1-3D-Q	10.2	15.1F7	12.3	12.3
<i>MPC1E Q</i>	MX-MPC1E-3D-Q	11.2R4	15.1F7	12.3	12.3

The following are some of the key features of the MPC:

- Contains two slots for Modular Interface Cards (MICs) labeled PIC0/1 and PIC2/3 .
- Supports LAN-PHY mode with the throughput of 10.31 Gbps and WAN-PHY mode with the throughput of 9.95 Gbps
- Supports small form-factor pluggable plus (SFP+) transceivers. For a list of supported transceivers, see the [MX Series Interface Module Reference](#).
- Supports intelligent oversubscription services.
- Supports one full-duplex, 16-Gigabit Ethernet tunnel interface for each Packet Forwarding Engine.

For information about the supported and unsupported Junos OS features for this MPC, see "Protocols and Applications Supported by MX Series MPCs" in the [MX Series Interface Module Reference](#).

#### Release History Table

Release	Description
18.3R1	Starting in JunosOS Release 18.3R1, on MX240, MX480, and MX960 routers, the MIC-MACSEC-20GE with SFP/SFP+ ports are supported on MPC1 line card.

#### Related Documentation

- [Understanding Rate Selectability on page 176](#)

## Understanding Interface Naming Conventions for MPC1

MPC1 facilitates configuration compatibility and enables you to replace an MX DPC with an MPC1 or MPC2 without requiring configuration change. The chassis daemon process (chassisd) creates physical interfaces for the tunnels only if it finds an associated tunnel bandwidth configuration.

The naming convention for virtual tunnels, for example is as follows:

*vt-mpc-slot/pic-slot/port-number.*

On MPC1, the PIC slot could be 0 or 1. Both the PIC slots are associated with the Packet Forwarding Engine PFE 0. [Table 3 on page 9](#) summarizes the MIC/PIC mapping for MPC1E and MPC1EQ.

Table 3: MIC/PIC Mapping for MPC1E and MPC1E-Q

MIC Type	Number of PICs per MIC	MIC Slot	PIC	Interfaces Name	PFE Mapping
20x1GE	2	0	PIC0:10x1GE	ge-x/0/0	PFE0
				ge-x/0/1	
				ge-x/0/2	
				ge-x/0/3	
				ge-x/0/4	
				ge-x/0/5	
				ge-x/0/6	
				ge-x/0/7	
				ge-x/0/8	
				ge-x/0/9	
			PIC1:10x1GE	ge-x/1/0	
				ge-x/1/1	
				ge-x/1/2	
				ge-x/1/3	
				ge-x/1/4	
				ge-x/1/5	
				ge-x/1/6	
				ge-x/1/7	
				ge-x/1/8	
				ge-x/1/9	
		1	PIC2:10x1GE	ge-x/2/0	
				ge-x/2/1	
				ge-x/2/2	

Table 3: MIC/PIC Mapping for MPC1E and MPC1E-Q (continued)

MIC Type	Number of PICs per MIC	MIC Slot	PIC	Interfaces Name	PFE Mapping
		0	PIC3:10x1GE	ge-x/2/3	
				ge-x/2/4	
				ge-x/2/5	
				ge-x/2/6	
				ge-x/2/7	
				ge-x/2/8	
				ge-x/2/9	
				ge-x/3/0	
				ge-x/3/1	
				ge-x/3/2	
				ge-x/3/3	
				ge-x/3/4	
				ge-x/3/5	
				ge-x/3/6	
				ge-x/3/7	
				ge-x/3/8	
				ge-x/3/9	
		1	PIC0:1x10GE	xe-x/0/0	
			PIC1:1x10GE	xe-x/1/0	
			PIC2:1x10GE	xe-x/2/0	
			PIC3:1x10GE	xe-x/3/0	

Table 3: MIC/PIC Mapping for MPC1E and MPC1E-Q (continued)

MIC Type	Number of PICs per MIC	MIC Slot	PIC	Interfaces Name	PFE Mapping
40x1GE	4	0 and 1	PIC0:10x1GE	ge-x/0/0	PFE0
				ge-x/0/1	
				ge-x/0/2	
				ge-x/0/3	
				ge-x/0/4	
				ge-x/0/5	
				ge-x/0/6	
				ge-x/0/7	
				ge-x/0/8	
				ge-x/0/9	
			PIC1:10x1GE	ge-x/1/0	
				ge-x/1/1	
				ge-x/1/2	
				ge-x/1/3	
				ge-x/1/4	
				ge-x/1/5	
				ge-x/1/6	
				ge-x/1/7	
				ge-x/1/8	
				ge-x/1/9	
			PIC2:10x1GE	ge-x/2/0	
				ge-x/2/1	
				ge-x/2/2	

Table 3: MIC/PIC Mapping for MPC1E and MPC1E-Q (continued)

MIC Type	Number of PICs per MIC	MIC Slot	PIC	Interfaces Name	PFE Mapping
				ge-x/2/3	
				ge-x/2/4	
				ge-x/2/5	
				ge-x/2/6	
				ge-x/2/7	
				ge-x/2/8	
				ge-x/2/9	
		PIC3:10x1GE		ge-x/3/0	
				ge-x/3/1	
				ge-x/3/2	
				ge-x/3/3	
				ge-x/3/4	
				ge-x/3/5	
				ge-x/3/6	
				ge-x/3/7	
				ge-x/3/8	
				ge-x/3/9	

**Related Documentation** • [MPC1 on MX Series Routers Overview on page 7](#)

## MPC2 on MX Series Routers Overview

In Junos OS Release 10.2 and later, MX240, MX480, MX960, MX2008, MX2010, and MX2020 routers support a new Modular Port Concentrator (MPC), MPC2. This MPC is a fixed-port MPC. On MX2020 and MX2010 routers, MPC2 is housed in an adapter card (ADC). MPC2 is available in the following models: MX-MPC2-3D(MPC2),

MX-MPC2-3D-Q(MPC2 Q), and MX-MPC2-3D-EQ(MPC2 EQ). This MPC provides scalability in bandwidth, subscribers, and services capabilities of the routers.

Starting in JunosOS Release 18.3R1, on MX240, MX480, and MX960 routers, the MIC-MACSEC-20GE with SFP/SFP+ ports are supported on MPC2 and MPC2E line cards.

The MIC-MACSEC-20GE includes MACSEC-enabled ports with 256-bit encryption (GCM-AES-256 and GCM-AES-XPN-256). For more information, refer to [“Understanding Interface Naming Conventions for MIC-MACSEC-20GE” on page 22](#).

MPC Name	MPC Model Number	First Junos OS Release on MX240, MX480, and MX960 Routers	First Junos OS Release on MX2008 Routers	First Junos OS Release on MX2010 Routers	First Junos OS Release on MX2020 Routers
<i>MPC2</i>	MX-MPC2-3D	10.1	15.1F7	12.3	12.3
<i>MPC2E</i>	MX-MPC2E-3D	11.2R4	15.1F7	12.3	12.3
<i>MPC2 Q</i>	MX-MPC2-3D-Q	10.1	15.1F7	12.3	12.3
<i>MPC2E Q</i>	MX-MPC2E-3D-Q	11.2R4	15.1F7	12.3	12.3
<i>MPC2 EQ</i>	MX-MPC2-3D-EQ	10.1	15.1F7	12.3	12.3
<i>MPC2E EQ</i>	MX-MPC2E-3D-EQ	11.2R4	15.1F7	12.3	12.3
<i>MPC2E P</i>	MX-MPC2E-3D-P	12.2	15.1F7	12.3	12.3
<i>MPC2E NG</i>	MX-MPC2E-3D-NG	14.1R4, 14.2R3 and Junos Continuity	15.1F7	14.1R4, 14.2R3 and Junos Continuity	14.1R4, 14.2R3 and Junos Continuity
		15.1		15.1	15.1
<i>MPC2E NG Q</i>	MX-MPC2E-3D-NG-Q	14.1R4, 14.2R3 and Junos Continuity	15.1F7	14.1R4, 14.2R3 and Junos Continuity	14.1R4, 14.2R3 and Junos Continuity
		15.1		15.1	15.1

The following are some of the key features of the MPC:

- Contains two slots for Modular Interface Cards (MICs) labelled PIC0/1 and PIC2/3 .
- Supports line-rate throughput of up to 80 Gbps
- Supports LAN-PHY mode with the throughput of 10.3125 Gbps and WAN-PHY mode with the throughput of 9.953 Gbps
- Supports small form-factor pluggable plus (SFP+) transceivers. For a list of supported transceivers, see the [MX Series Interface Module Reference](#).
- Supports intelligent oversubscription services.

For information about the supported and unsupported Junos OS features for this MPC, see *Protocols and Applications Supported on MPCs for MX Series Routers*.

**Release History Table**

Release	Description
18.3R1	Starting in JunosOS Release 18.3R1, on MX240, MX480, and MX960 routers, the MIC-MACSEC-20GE with SFP/SFP+ ports are supported on MPC2 and MPC2E line cards.

**Related Documentation**

- [Understanding Rate Selectability on page 176](#)

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## Understanding Interface Naming Conventions for MPC2

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MPC2 facilitates configuration compatibility and enables you to replace an MX DPC with an MPC1 or MPC2 without requiring configuration change. The chassis daemon process (chassisd) creates physical interfaces for the tunnels only if it finds an associated tunnel bandwidth configuration.

The naming convention for virtual tunnels, for example is as follows:

*vt-mpc-slot/pic-slot/port-number.*

On MPC2, the pic-slot could be of the range 0 through 3. The logical pic slot 0 and slot 1 are associated with PFE 0 and logical MIC slot 2 and slot 3 are associated with PFE 1. [Table 4 on page 15](#) summarizes the MIC/PIC mapping for MPC2E, MPC2E-Q, and MPC2E-EQ.



Table 4: MIC/PIC Mapping for MPC2E, MPC2E-Q, and MPC2E-EQ

MIC Type	Number of PICs per MIC	MIC Slot	PIC	Interfaces Name	PFE Mapping
20x1GE	2	0	PIC0:10x1GE	ge-x/0/0	PFE0
				ge-x/0/1	
				ge-x/0/2	
				ge-x/0/3	
				ge-x/0/4	
				ge-x/0/5	
				ge-x/0/6	
				ge-x/0/7	
				ge-x/0/8	
				ge-x/0/9	
			PIC1:10x1GE	ge-x/1/0	
				ge-x/1/1	
				ge-x/1/2	
				ge-x/1/3	
				ge-x/1/4	
				ge-x/1/5	
				ge-x/1/6	
				ge-x/1/7	
				ge-x/1/8	
				ge-x/1/9	
		1	PIC2:10x1GE	ge-x/2/0	PFE1
				ge-x/2/1	
				ge-x/2/2	

Table 4: MIC/PIC Mapping for MPC2E, MPC2E-Q, and MPC2E-EQ (continued)

MIC Type	Number of PICs per MIC	MIC Slot	PIC	Interfaces Name	PFE Mapping
				ge-x/2/3	
				ge-x/2/4	
				ge-x/2/5	
				ge-x/2/6	
				ge-x/2/7	
				ge-x/2/8	
				ge-x/2/9	
			PIC3:10x1GE	ge-x/3/0	
				ge-x/3/1	
				ge-x/3/2	
				ge-x/3/3	
				ge-x/3/4	
				ge-x/3/5	
				ge-x/3/6	
				ge-x/3/7	
				ge-x/3/8	
				ge-x/3/9	
2x10GE	2	0	PIC0:1x10GE	xe-x/0/0	PFE0
			PIC1:1x10GE	xe-x/1/0	
		1	PIC2:1x10GE	xe-x/2/0	PFE1
			PIC3:1x10GE	xe-x/3/0	

Table 4: MIC/PIC Mapping for MPC2E, MPC2E-Q, and MPC2E-EQ (continued)

MIC Type	Number of PICs per MIC	MIC Slot	PIC	Interfaces Name	PFE Mapping
4x10GE	2	0	PIC0:2x10GE	xe-x/0/0	PFE0
				xe-x/0/1	
			PIC1:2x10GE	xe-x/1/0	
				xe-x/1/1	
		1	PIC2:2x10GE	xe-x/2/0	PFE1
				xe-x/2/1	
			PIC3:2x10GE	xe-x/3/0	
				xe-x/3/1	

Table 4: MIC/PIC Mapping for MPC2E, MPC2E-Q, and MPC2E-EQ (continued)

MIC Type	Number of PICs per MIC	MIC Slot	PIC	Interfaces Name	PFE Mapping
40x1GE	4	0 and 1	PIC0:10x1GE	ge-x/0/0	PFE0
				ge-x/0/1	
				ge-x/0/2	
				ge-x/0/3	
				ge-x/0/4	
				ge-x/0/5	
				ge-x/0/6	
				ge-x/0/7	
				ge-x/0/8	
				ge-x/0/9	
			PIC1:10x1GE	ge-x/1/0	
				ge-x/1/1	
				ge-x/1/2	
				ge-x/1/3	
				ge-x/1/4	
				ge-x/1/5	
				ge-x/1/6	
				ge-x/1/7	
				ge-x/1/8	
				ge-x/1/9	
			PIC2:10x1GE	ge-x/2/0	PFE1
				ge-x/2/1	
				ge-x/2/2	

Table 4: MIC/PIC Mapping for MPC2E, MPC2E-Q, and MPC2E-EQ (continued)

MIC Type	Number of PICs per MIC	MIC Slot	PIC	Interfaces Name	PFE Mapping
				ge-x/2/3	
				ge-x/2/4	
				ge-x/2/5	
				ge-x/2/6	
				ge-x/2/7	
				ge-x/2/8	
				ge-x/2/9	
		PIC3:10x1GE		ge-x/3/0	
				ge-x/3/1	
				ge-x/3/2	
				ge-x/3/3	
				ge-x/3/4	
				ge-x/3/5	
				ge-x/3/6	
				ge-x/3/7	
				ge-x/3/8	
				ge-x/3/9	

**Related Documentation** • [MPC2 on MX Series Routers Overview on page 12](#)

## Tunnel Interfaces on MX Series Routers with MPC1 and MPC2

MPC1 and MPC2 on the MX series routers support the following tunnel interfaces:

- gr-x/y/z—for GRE tunnels over IP
- ip-x/y/z—for IP over IP tunnels
- mt-x/y/z—for multicast tunnels
- pe-x/y/z—for PIM encapsulator interface
- pd-x/y/z—for PIM decapsulator interface
- lt-x/y/z—for logical tunnel interface connecting logical routers
- vt-x/y/z—for VPN tunnel interface for looping back packets from core into the PE and doing additional lookup



**NOTE:** x maps to the FPC slot, y maps to PIC slot and z maps to the port.

The following MPCs provide tunnel support parity, replacing traditional tunnel and services PICs with tunnels that were supported on a virtual port on the MX Series Packet Forwarding Engine.

- MX-MPC1-3D (MPC1)
- MX-MPC1-3D-Q (MPC1Q)
- MX-MPC2-3D (MPC2)
- MX-MPC2-3D-Q (MPC2 Q)
- MX-MPC2-3D-EQ (MPC2 EQ)

MX Series routers support a virtual PIC and a virtual port, visible for tunnel configuration, and eliminating the need for a tunnel PIC. Traditional tunnel PIC features are supported, including:

- GRE keys
- GRE clear-dont-fragment-bit

On MPC1 and MPC2 there are no tunnel PICs. Instead the MX router reserves some bandwidth for tunneling. In the presence of tunnel traffic, all WAN ports are affected in case of oversubscription.

You create tunnel interfaces on MX Series routers by including the following statements at the [edit chassis] hierarchy level on a particular PIC. For example

```
[edit chassis]
fpc 0 {
  pic 0 {
    tunnel-services {
```

```

        bandwidth 1g;
    }
}
fpc 0 {
pic 1 {
    tunnel-services {
        bandwidth 1g;
    }
}
}
}

```

This configuration enables tunnel services with a bandwidth of 1Gbps on FPC 0 and PIC 0. With this configuration, the tunnel interfaces created are:

- vt-0/0/0, ip-0/0/0, and so on for PIC 0
- vt-0/1/0, ip-0/1/0 and so on for PIC 1

MPC1 and MPC2 support bandwidth of 1 Gbps and 10 Gbps. The tunnel interfaces with their associated configurations work when an MX-DPC is replaced by an MPC. The router creates tunnel devices based on the tunnel services configuration. Although the same Packet Forwarding Engine supports vt-0/0/0 and vt-0/1/0, two devices must be created to be compatible with the above configuration. The MPCs allows you to configure four tunnel MICs per MPC (to support vt-0/0/0, vt-0/1/0, vt-0/2/0, vt-0/3/0), although in reality there are only two physical MICs. This is achieved by creating logical MICs on the MPCs.

### Packet Forwarding Engine Mapping and Tunnel Bandwidth for MPC1E and MPC1E-Q

The tunnel bandwidth for MPC1E and MPC1E-Q is 1Gbps or 10Gbps . However, if you do not specify the bandwidth in the configuration, it is set to 16Gbps.

[Table 5 on page 21](#) shows the mapping between the tunnel bandwidth and the Packet Forwarding Engines for MPC1E and MPC1E-Q .

**Table 5: Packet Forwarding Engine Mapping and Tunnel Bandwidth for MPC1E and MPC1E-Q**

Tunnel PIC	Maximum Bandwidth per Tunnel PIC	PFE Mapping	Maximum Tunnel Bandwidth per PFE	Maximum PFE Bandwidth
PIC0	16Gbps	PFE0	16Gbps	40Gbps
PIC1	16Gbps			
PIC2	16Gbps			
PIC3	16Gbps			

### Packet Forwarding Engine Mapping and Tunnel Bandwidth for MPC2E, MPC2E-Q, and MPC2E-EQ

The tunnel bandwidth for MPC2E, MPC2E-Q, and MPC2E-EQ is 1Gbps or 10Gbps . However, if you do not specify the bandwidth in the configuration, it is set to 16Gbps.

Table 6 on page 22 shows the mapping between the tunnel bandwidth and the Packet Forwarding Engines for MPC2E, MPC2E-Q, and MPC2E-EQ.

**Table 6: Packet Forwarding Engine Mapping and Tunnel Bandwidth for MPC2, /MPC2E-Q, and MPC2E-EQ**

Tunnel PIC	Maximum Bandwidth per Tunnel PIC	PFE Mapping	Maximum Tunnel Bandwidth per PFE	Maximum PFE Bandwidth
PIC0	16Gbps	PFE0	16Gbps	40Gbps
PIC1	16Gbps			
PIC2	16Gbps	PFE1	16Gbps	40Gbps
PIC3	16Gbps			

**Related Documentation** • [clear-dont-fragment-bit](#)

## Understanding Interface Naming Conventions for MIC-MACSEC-20GE

By default, MIC-MACSEC-20GE operates in 1-Gigabit Ethernet mode. In this mode, the ports in the MIC are created as “ge” interfaces distributed across PIC0 and PIC1.

In 10-Gigabit Ethernet mode, the ports in the MIC will be created as “xe” interfaces one each on PIC 0 and PIC 1. In this mode, the 10G ports physically maps to the front panel port 8 and 9 on the second PIC of the MIC (that is marked on the front panel of the MIC).



**NOTE:** In the 10G mode, only the marked ports are operational and other physical ports are disabled.

**Table 7: Interface Naming Convention for MIC-MACSEC-20GE**

PIC	1-Gigabit Ethernet Interface	10-Gigabit Ethernet Interface
PIC 0	<b>ge-x/0/[0-9]</b>	<b>xe-x/0/0</b>
PIC 1	<b>ge-x/1/[0-9]</b>	<b>xe-x/1/0</b>
PIC 2	<b>ge-x/2/[0-9]</b>	<b>xe-x/2/0</b>
PIC 3	<b>ge-x/3/[0-9]</b>	<b>xe-x/3/0</b>

You should use the **pic-mode 10G** configuration command to set the PIC to operate in 10G mode. Both the PICs on a MIC must be configured in the same pic-mode, otherwise the configuration does not take effect. A chassis alarm is raised indicating a mis-configuration. Any mis-configuration will cause the PICs to assume default pic-mode, that is, to be in 20x1GE where all ports are in 1GE port speed.





**NOTE:** The 10-Gbps-capable ports (ports 8 and 9) of the 2x10GE/20x1GE MIC-MACSEC-20GE may show the link status as up while the peer side is down. In this case, it is recommended to disable auto-negotiation and set the speed to 1-Gbps on the peer side to bring the link up on the peer side.

The MIC-MACSEC-20GE MIC also provides 128-bit and 256-bit MACsec encryption on all the twenty 1GE and on the two 10GE ports in the following hardware configuration:

- Installed directly on the MX80 and MX104 routers
- Installed on MPC1, MPC2, MPC3, MPC2E, MPC3E, MPC2E-NG, and MPC3E-NG line cards on the MX240, MX480, and MX960 routers

By default, 128-bit MACsec encryption is supported.

The twenty 1-Gigabit Ethernet SFP ports distributes the ports across PIC0 and PIC1, that are logical PICs on the physical MIC. The two 10-Gigabit Ethernet SFP+ ports are physically located on PIC1. But, the 10-Gigabit interfaces are created by distributing the ports in either of the PICs.



**NOTE:**

- When the pic-mode is changed from 1-Gbps to 10-Gbps or vice versa, the Flexible PIC Concentrator (FPC) in MX240, MX480, MX960 routers and the Forwarding Engine Board (FEB) in MX80, MX104 routers undergoes an automatic bounce or a reboot.
- When the MIC-MACSEC-20GE is operating in the 10-Gbps mode, all the other 1-Gbps ports are disabled.

#### Related Documentation

- [Understanding Rate Selectability on page 176](#)
- [Configuring MACsec on MX Series Routers](#)
- [cipher-suite](#)
- [MPC1 on MX Series Routers Overview on page 7](#)
- [MPC2 on MX Series Routers Overview on page 12](#)
- [MPC3E on MX Series Routers Overview on page 23](#)

## MPC3E on MX Series Routers Overview

MX960, MX480, MX240, and MX2020 routers support the MPC3E (MX-MPC3E-3D) with two MIC slots. The MPC provides the connection between the customer's Ethernet interfaces and the routing fabric of the MX Series chassis.

The MPC3E supports these MICs as field-replaceable units (FRUs):

- *100-Gigabit Ethernet MIC with CFP* (model number MIC3-3D-1X100GE-CFP)
- *100-Gigabit Ethernet MIC with CXP* (model number MIC3-3D-1X100GE-CXP)
- *10-Gigabit Ethernet MIC with SFP+ (10 Ports)* (model number MIC3-3D-10XGE-SFPP)
- *2-port 40-Gigabit Ethernet MIC with QSFP+* (model number MIC3-3D-2X40GE-QSFPP)
- *20-port Enhanced Gigabit Ethernet MIC with SFP (E)* (model number MIC-3D-20GE-SFP-E)

The MPC3E also supports these legacy MICs:

- *20-port Gigabit Ethernet MIC with SFP* (model number MIC-3D-20GE-SFP)
- *2-port 10-Gigabit Ethernet MICs with XFP* (model number MIC-3D-2XGE-XFP)
- *20-port Gigabit Ethernet MIC with SFP/SFP+* (model number MIC-MACSEC-20GE)

Starting in JunosOS Release 18.3R1, on MX240, MX480, and MX960 routers, the MIC-MACSEC-20GE with SFP/SFP+ ports are supported on MPC3 and MPC3E line cards.

The MIC-MACSEC-20GE includes MACSEC-enabled ports with 256-bit encryption (GCM-AES-256 and GCM-AES-XPN-256). For more information, refer to [“Understanding Interface Naming Conventions for MIC-MACSEC-20GE” on page 22](#).

The MPC3E requires the Enhanced MX Switch Control Board (SCBE) for fabric redundancy. You can also continue to use existing SCBs without fabric redundancy. The MPC interoperates with existing MX Series line cards, including Dense Port Concentrators (DPCs) and Modular Port Concentrators (MPCs).

You can also configure the 100-Gigabit Ethernet MIC (MIC3-3D-1X100GE-CFP) to interoperate with routers using the 100-Gigabit Ethernet PIC (Type 4 1X100GE PIC for STFPC4 FPC) by using the **forwarding-mode** statement with the **sa-multicast** option at the **[edit chassis fpc slot pic slot]** hierarchy level. For more information, see [“Configuring 100-Gigabit Ethernet MICs to Interoperate with Type 4 100-Gigabit Ethernet PICs \(PD-ICE-CFP-FPC4\) Using SA Multicast Mode” on page 80](#).

The MPC3E is based on a new Juniper Networks chipset for increased scalability for bandwidth, subscribers, and service capabilities of the routers.

The MPC3E supports these key features:

- 100-Gigabit Ethernet interfaces
- Two separate slots for MICs
- The following MICs:
  - MIC3-3D-1X100GE-CFP
  - MIC3-3D-1X100GE-CXP
  - MIC3-3D-10XGE-SFPP
  - MIC3-3D-2X40GE-QSFPP

- MIC-3D-20GE-SFP
- MIC-3D-20GE-SFP-E
- MIC-3D-2XGE-XFP
- MIC-3D-8OC3OC12-4OC48
- MIC-3D-4OC3OC12-1OC48
- MIC-3D-1OC192-XFP
- MIC-3D-8DS3-E3
- Up to 100 Gbps per MIC slot
- Up to 200 Gbps aggregate WAN bandwidth connectivity for the two MIC slots; the line card is oversubscribed in the ratio of 1.5:1.
- Up to four full-duplex tunnel interfaces on the line card
- Intelligent oversubscription services
- Configuration of Virtual Chassis ports in an MX Series Virtual Chassis member router

The MPC3E supports all MX Series Virtual Chassis features, including Layer 2 and IEEE 802.3ad link aggregation features. An MX Series Virtual Chassis configuration does not currently support the Spanning Tree Protocol (STP).



**NOTE:** On the MX960 router, FPC slot 0 and slot 11 are not NEBS compliant beyond 104°F (40°C) with MPC3E-3D-NG and MPC3E-3D-NG-Q. This is a cooling restriction.

For more information about supported Junos OS features on the MPC3E, see *Protocols and Applications Supported by the MPC3E on MX Series Routers* in the [MX Series Interface Module Reference](#).

The MPC3E supports feature parity with the following software features:

- Basic Layer 2 features and virtual private LAN service (VPLS) functionality
- Layer 3 routing protocols
- MPLS
- Multicast forwarding
- Firewall filters and policers
- Intelligent hierarchical policers
- Per unit scheduling
- Class-of-service (CoS) support
- Synchronous Ethernet
- Tunnel support

- Interoperability with existing DPCs and MPCs
- Unified in-service software upgrade (ISSU)

For information about the supported and unsupported Junos OS features for this MPC, see *Protocols and Applications Supported by the MPC3E on MX Series Routers* in the [MX Series Interface Module Reference](#).

Starting from Junos OS Release 13.3R1, the following encapsulations are supported on the MIC-3D-8OC3OC12-4OC48, MIC-3D-4OC3OC12-1OC48, MIC-3D-1OC192-XFP, and the MIC-3D-8DS3-E3 on MPC3E:

- Cisco High-Level Data Link Control (Cisco HDLC)
- Flexible Frame Relay
- Frame Relay
- Frame Relay for CCC
- Frame Relay for TCC
- MPLS fast reroute
- MPLS circuit cross-connect (CCC)
- MPLS translational cross-connect (TCC)
- Point-to-Point Protocol (PPP) (default encapsulation)
- PPP for CCC
- PPP for TCC
- PPP over Frame Relay

Note that the aggregated SONET is supported only for Cisco HDLC and PPP encapsulations.

#### Release History Table

Release	Description
<a href="#">18.3R1</a>	Starting in JunosOS Release 18.3R1, on MX240, MX480, and MX960 routers, the MIC-MACSEC-20GE with SFP/SFP+ ports are supported on MPC3 and MPC3E line cards.

#### Related Documentation

- [MPC3E MIC Overview](#)
- [Protocols and Applications Supported by the MPC3E on MX Series Routers](#)
- [Understanding Rate Selectability on page 176](#)
- [Configuring Tunnel Interfaces on MX Series Routers with the MPC3E on page 63](#)
- [Configuring 100-Gigabit Ethernet MICs to Interoperate with Type 4 100-Gigabit Ethernet PICs \(PD-1CE-CFP-FPC4\) Using SA Multicast Mode on page 80](#)
- [2-port 10-Gigabit Ethernet MICs with XFP](#)

- [MX Series Interface Module Reference](#).

## MPC4E on MX Series Routers Overview

In Junos OS Release 12.3R2 and later, MX2020, MX2010, MX960, MX480, and MX240 routers support a new MPC, MPC4E. MPC4E is a fixed-configuration MPC that provides scalability in bandwidth and services capability of the routers. MPC4E is available in two models—MPC4E-3D-32XGE-SFP and MPC4E-3D-2CGE-8XGE.

Type of MPC4E	Ports	Interfaces	Optical Transceiver Support	Initial Release
MPC4E-3D-32XGE-SFP	32 built-in 10-Gigabit Ethernet ports	10-Gigabit Ethernet interfaces	10GBASE-LR, 10GBASE-SR, 10GBASE-ER, 10GBASE-ZR	12.3R2
MPC4E-3D-2CGE-8XGE	2 built-in 100-Gigabit Ethernet ports and 8 built-in 10-Gigabit Ethernet ports	10-Gigabit Ethernet and 100-Gigabit Ethernet interfaces	100GBASE-LR4, 100GBASE-SR10, 10GBASE-LR, 10GBASE-SR, 10GBASE-ER, 10GBASE-ZR	12.3R2



**NOTE:** Both models of MPC4E are supported on the MX2020, MX2010, MX960, MX480, and MX240 routers with both normal-capacity and high-capacity power supplies and fan trays.

MPC4E does not support legacy SCBs. It interoperates with existing MX Series line cards, including Dense Port Concentrators (DPCs) and Modular Port Concentrators (MPCs).

MPC4E is a fixed-configuration MPC and does not contain separate slots for Modular Interface Cards (MICs). It contains two Packet Forwarding Engines (PFEs)—PFE0 hosts PIC0 and PIC1 while PFE1 hosts PIC2 and PIC3.

You can also configure the MPC4E to interoperate with routers that use the 100-Gigabit Ethernet PIC (Type 4 PIC on Type 4 FPC) by using the **forwarding-mode** statement with the **sa-multicast** option at the **[edit chassis fpc slot pic slot]** hierarchy level. For more information, see [“Configuring MPC4E \(MPC4E-3D-2CGE-8XGE\) to Interoperate with 100-Gigabit Ethernet PICs on Type 4 FPC Using SA Multicast Mode”](#) on page 83.

MPC4E supports:

- Forwarding capability of up to 130 Gbps per Packet Forwarding Engine.
- Small form-factor pluggable (SFP) and C form-factor pluggable (CFP) transceivers for connectivity.
- Up to 260 Gbps of full-duplex traffic.
- Intelligent oversubscription services.
- WAN-PHY mode on 10-Gigabit Ethernet interfaces on a per-port basis.
- Up to four full-duplex tunnel interfaces on each MPC4E.



**NOTE:** By default on MX480 routers, only 5 out of the 6 line-card slots can be populated with MPC4Es. By default on MX960 routers, only 10 out of the 11 line-card slots can be populated with MPC4Es. This is a power restriction of default operating mode which supports operation at 55°C ambient temperature. You can insert other line-cards in the remaining slots as long as the power budget is not exceeded. However, if ambient-temperature is configured to 25°C or 40°C, all the 6 slots of an MX480 can be populated with MPC4E, and all the 11 slots of an MX960 can be populated with MPC4E. For more information about power requirements, see *Power Requirements for an MX480 Router*, and *Power Requirements for an MX960 Router*.

Also, on the MX960 router, FPC slot 0 and FPC slot 11 are not NEBS compliant beyond 104°F (40°C). This is a cooling restriction.

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For more information about the supported and unsupported Junos OS software features for this MPC, see *Protocols and Applications Supported on the MPC4E for MX Series Routers* in the *MX Series Line Card Guide*.

**Related  
Documentation**

- *2x100GE + 8x10GE MPC4E*
- *32x10GE MPC4E*
- *Calculating Power Requirements for MX240 Routers*
- *Calculating Power Requirements for MX480 Routers*
- *Calculating Power Requirements for MX960 Routers*
- *Calculating AC Power Requirements for MX2010 Routers*
- *Calculating DC Power Requirements for MX2010 Routers*
- *Calculating AC Power Requirements for MX2020 Routers*
- *Calculating DC Power Requirements for MX2020 Routers*
- *Protocols and Applications Supported on the MPC4E for MX Series Routers*

## MPC5E on MX Series Routers Overview

In Junos OS Release 13.3R2 and later, MX2020, MX2010, MX960, MX480, and MX240 routers support a new MPC, MPC5E. MPC5E is a fixed-port MPC. On MX2020 and MX2010 routers, MPC5E is housed in an adapter card (ADC). MPC5E is available in the following models:

Type of MPC5E	Ports	Interfaces	Optical Transceiver Support	Initial Release
MPC5E-40G10G	6 built-in 40-Gigabit Ethernet ports and 24 built-in 10-Gigabit Ethernet ports	40-Gigabit Ethernet and 10-Gigabit Ethernet interfaces	40GBASE-SR4, 40GBASE-LR4, 10GBASE-LR, 10GBASE-SR, 10GBASE-ER, 10GBASE-ZR	13.3R2
MPC5EQ-40G10G	6 built-in 40-Gigabit Ethernet ports and 24 built-in 10-Gigabit Ethernet ports	40-Gigabit Ethernet and 10-Gigabit Ethernet interfaces	40GBASE-SR4, 40GBASE-LR4, 10GBASE-LR, 10GBASE-SR, 10GBASE-ER, 10GBASE-ZR	13.3R2
MPC5E-100G10G	2 built-in 100-Gigabit Ethernet ports and 4 built-in 10-Gigabit Ethernet ports	100-Gigabit Ethernet and 10-Gigabit Ethernet interfaces	100GBASE-SR10, 100GBASE-LR4, 100GBASE-ER4, 10GBASE-LR, 10GBASE-SR, 10GBASE-ER, 10GBASE-ZR	13.3R3
MPC5EQ-100G10G	2 built-in 100-Gigabit Ethernet ports and 4 built-in 10-Gigabit Ethernet ports	100-Gigabit Ethernet and 10-Gigabit Ethernet interfaces	100GBASE-SR10, 100GBASE-LR4, 100GBASE-ER4, 10GBASE-LR, 10GBASE-SR, 10GBASE-ER, 10GBASE-ZR	13.3R3

MPC5E supports the enhanced Switch Control Board (MX-SCBE) and MX-SCBE2 on MX240, MX480, and MX960 routers. MPC5E does not support the legacy SCB (MX-SCB). MPC5E supports the Switch Fabric Board (SFB) on MX2010 and MX2020 routers.

On MX240, MX480, and MX960 routers, the number of MPC5Es that can be supported depends on the power entry module (PEM) type. There are no such restrictions for MX2010 and MX2020 routers.



**NOTE:** On MX960 routers, all the MPC slots work with chassis temperature of up to 40°C (104°F). However, when the chassis temperature exceeds 40°C (104°F), slots 0 and 11 can only work with MPC1, MPC2, and the 16x10GE MPC.

MPC5E interoperates with existing MPCs but does not interoperate with existing DPCs, except the Multiservices DPC (MS-DPC). MX series routers do not support tunnel services PICs. MPC5E provides support for inline tunnel interfaces and supports the following tunnel types:

- Generic Routing Encapsulation (GRE) Tunnels
- Multicast Tunnels (MT)

- IP-IP Tunnels
- Protocol Independent Multicast (PIM) E tunnels
- Virtual loopback Tunneling (VT)
- Logical Tunnelling (LT)



**NOTE:** On MX240, MX480, and MX960 routers, MPC5E powers on only if the **network-services** mode on the router is configured to either **enhanced-ip** or **enhanced-ethernet**. On the MX2010 and MX2020 routers, **enhanced-ip** is the only **network-services** mode supported.

MPC5E supports:

- Forwarding capability of up to 130 Gbps per Packet Forwarding Engine
- [“Flexible Queuing Mode” on page 45](#) using an add-on license
- Intelligent oversubscription services
- Optical Channel Transport Network services
- Quad small form-factor pluggable plus transceivers (QSFP+) and small form-factor pluggable transceivers (SFP) for connectivity
- Up to 240 Gbps of full-duplex traffic
- WAN-PHY mode on 10-Gigabit Ethernet interfaces on a per-port basis

For more information about the supported and unsupported Junos OS software features for this MPC, see *Protocols and Applications Supported by the MPC5E for MX Series Routers* in the [MX Series Interface Module Reference](#).

#### Release History Table

Release	Description
13.3R2	In Junos OS Release 13.3R2 and later, MX2020, MX2010, MX960, MX480, and MX240 routers support a new MPC, MPC5E.

#### Related Documentation

- [6x40GE + 24x10GE MPC5E](#)
- [6x40GE + 24x10GE MPC5EQ](#)
- [2x100GE + 4x10GE MPC5E](#)
- [2x100GE + 4x10GE MPC5EQ](#)
- [10-Gigabit Ethernet OTN Options Configuration Overview](#)
- [100-Gigabit Ethernet OTN Options Configuration Overview](#)
- [Calculating Power Requirements for MX480 Routers](#)
- [Calculating Power Requirements for MX960 Routers](#)



- *Calculating Power Requirements for MX240 Routers*
- *Protocols and Applications Supported by the MPC5E for MX Series Routers*

## MPC6E on MX Series Routers Overview

In Junos OS Release 13.3R2 and later, MX2020 and MX2010 routers support a new MPC, MPC6E (model number: MX2K-MPC6E). MPC6E is a 100-Gigabit Ethernet MPC that provides increased port density and performance to MX Series routers in broadband access networks for services such as Layer 3 peering, VPLS and Layer 3 aggregation, and video distribution.

MPC6E supports two MIC slots and each MIC slot supports a single MIC. The MPC can have any of the following MICs:

- 4-port 100-Gigabit Ethernet MIC with CXP
- 2-port 100-Gigabit Ethernet MIC with CFP2
- 24-port 10-Gigabit Ethernet MIC with SFPP (non-OTN)
- 24-port 10-Gigabit Ethernet MIC with SFPP OTN

Based on the MICs used, the following MPC6E models are supported:

Type of MPC6E	Ports	Interfaces	Initial Release
MX2K-MIC6-24XE	24 built-in 10-Gigabit Ethernet ports	10-Gigabit Ethernet interfaces	13.3R2
MX2K-MIC6-4CE-CXP	4 built-in 100-Gigabit Ethernet ports	100-Gigabit Ethernet interfaces	13.3R2
MX2K-MIC6-24XE-OTN	24 built-in 10-Gigabit Ethernet ports with OTN	10-Gigabit Ethernet interfaces	13.3R3
MX2K-MIC6-2CE-CFP2	2 built-in 100-Gigabit Ethernet ports with OTN	100-Gigabit Ethernet interfaces	13.3R3

MPC6E supports:

- Two Packet Forwarding Engines for each MIC slot.
- Forwarding capability of up to 130 Gbps per Packet Forwarding Engine.
- Two separate slots for MICs (MIC6-10G and MIC6-100G).
- Up to 520 Gbps of full-duplex traffic for the two MIC slots.
- Intelligent oversubscription services.
- WAN-PHY mode on 10-Gigabit Ethernet interfaces on a per-port basis.

MPC6E supports the following software features:

- Basic Layer 2 features and virtual private LAN service (VPLS) functionality, except for Operation, Administration, and Maintenance (OAM)
- Layer 3 routing protocols
- MPLS
- Multicast forwarding
- Firewall filters and policers
- Class of service (CoS)
- Tunnel service
- Interoperability with existing MPCs
- Internet Group Management Protocol (IGMP) snooping with bridging, integrated routing and bridging (IRB), or VPLS
- Intelligent hierarchical policers
- Layer 2 trunk port
- MPLS fast reroute (FRR) VPLS instance prioritization
- Synchronous Ethernet

The following features are not supported on MPC6E:

- Fine-grained queuing and input queuing
- Active flow monitoring and services
- Virtual Chassis support

For more information about the supported and unsupported Junos OS software features for this MPC, see *Protocols and Applications Supported by the MPC6E for MX2000 Routers* in the *Interface Reference Module Guide*.

#### Release History Table

Release	Description
13.3R2	In Junos OS Release 13.3R2 and later, MX2020 and MX2010 routers support a new MPC, MPC6E (model number: MX2K-MPC6E).

#### Related Documentation

- *MPC6E*
- *10-Gigabit Ethernet OTN Options Configuration Overview*
- *100-Gigabit Ethernet OTN Options Configuration Overview*
- *Protocols and Applications Supported by the MPC6E for MX2000 Routers*

## MPC7E (Multi-Rate) on MX Series Routers Overview

In Junos OS Release 15.1F4 and later, MX2020, MX2010, MX960, MX480, and MX240 routers support the rate-selectable MPC MPC7E (Multi-Rate) (model number: MPC7E-MRATE). The MPC7E-MRATE MPC is a fixed-configuration MPC that provides scalability in bandwidth and services capability of the routers.

The main features of the MPC7E-MRATE MPC are the following:

- Line-rate throughput of up to 480 Gbps on MX240, MX480, and MX960 routers.
- Line-rate throughput of up to 400 Gbps on the MX2000 line of routers.
- Twelve ports that can each be configured as a 40-Gigabit Ethernet port or as four 10-Gigabit Ethernet ports by using a breakout cable. The ports support quad small-form factor pluggable plus (QSFP+) transceivers.
- Four ports—0/2, 0/5, 1/2, and 1/5—out of the twelve ports can be configured as 100-Gigabit Ethernet ports.
- By default, the ports are configured as 10-Gigabit Ethernet ports.
- You can configure different combinations of port speeds as long as the aggregate capacity per group of six ports labeled 0/0 through 0/5 does not exceed 240 Gbps. Similarly, aggregate capacity per group of the other six ports labeled 1/0 through 1/5 must not exceed 240 Gbps.

For information about the supported and unsupported Junos OS features for this MPC, see *Protocols and Applications Supported by the MPC7E for MX Series Routers* in the *MX Series Line Card Guide*.

## MPC7E-MRATE Gigabit Ethernet Interface Naming Convention

The MPC7E-MRATE MPC is a fixed-configuration MPC and does not contain separate slots for Modular Interface Cards (MICs). It contains two PICs, PIC 0 and PIC 1. Each PIC has six physical quad small form-factor pluggable plus (QSFP+) ports that support 100-Gbps, 10-Gbps, or 40-Gbps port speeds. You use the 4x duplex LC breakout cables and fiber-optic 40-gigabit and 100-gigabit QSFP+ transceivers to achieve these speeds.



**TIP:** You can issue the `show chassis pic fpc-slot fpc-slot-number pic-slot pic-slot-number` command to view the supported speeds on each port.

Each of the six ports of PIC 0 and PIC 1 supports 10-Gigabit and 40-Gigabit Ethernet interfaces. However, only ports 2 and 5 on both the PICs support 100-Gigabit Ethernet interfaces. The 40 and 100 Gigabit Ethernet interfaces configured on the MPC7E-MRATE MPC follow the naming convention `et-fpc-slot/pic-slot/port-number`. For example, `et-0/0/2` indicate a 40-Gigabit or 100-Gigabit Ethernet interface configured on port 2 of PIC 0 of the MPC7E-MRATE MPC that is installed in the FPC slot 0.

You can configure four 10-Gigabit Ethernet interfaces on each port. Therefore, the 10 Gigabit Ethernet interfaces configured on the MPC7E-MRATE MPC follow the naming convention *xe-fpc-slot/pic-slot/port-number:channel-number*. Channel numbers 0 to 3 are used to indicate the four logical ports that are enabled by the use of the 4x duplex LC breakout cables. Therefore, the four 10-Gigabit Ethernet interfaces that are configured on port 2 of PIC 0 of an MPC7E-MRATE MPC that is installed in the FPC slot 0 is as follows:

- **xe-0/0/2:0**
- **xe-0/0/2:1**
- **xe-0/0/2:2**
- **xe-0/0/2:3**

### MPC7E-MRATE MPC Rate-Selectability Overview

You can choose to configure all supported ports of the PIC to operate at the same speed or configure all the ports at different supported speeds. For example, you can choose to configure:

- All the ports of the PIC at 10-Gbps speed.
- All the ports of the PIC at 40-Gbps speed.
- Ports 2 and 5 of the PIC at 100-Gbps speed.
- Ports 0, 1, 3, 4 of the PIC at 10-gigabit or 40-gigabit speed and ports 2 and 5 at 100-gigabit speed.

To configure all ports to operate at the same speed, you configure rate selectability at the *PIC level*. When you configure rate selectability at the PIC level, all the ports of the PIC that support the configured speed operate at that speed. Additionally, you can configure the number of active ports that operate at the configured speed. That is, for example, if you want only two ports of the PIC to operate at 40-gigabit speed, you can configure the PIC to operate at 40-gigabit speed and enable the two ports that you want to operate at that speed. The remaining four ports of the PIC are automatically disabled. Configuring rate selectability at the PIC level helps you configure the operating speed of the PIC easily.

To configure different ports of the PIC to operate at different supported speeds, you configure rate selectability at the *port level*. You configure each port of the PIC to operate at a specific supported speed. Only the ports that are configured are enabled, while the other ports are automatically disabled. Configuring rate selectability at the PIC level provides you the flexibility of operating the ports of the PIC at different supported speeds. For example, you can configure four 10-Gigabit Ethernet interfaces on port 0, one 40-Gigabit Ethernet interface on port 1, and one 100-Gigabit Ethernet interface on port 2.

**NOTE:**

- Ensure that you connect optics to the ports according to the speeds that you configure. That is, you have to use 4x duplex LC breakout cables to configure 10-Gigabit Ethernet interfaces, fiber-optic 40-gigabit QSFP+ transceivers to configure 40-Gigabit Ethernet interfaces, and fiber-optic 100-gigabit QSFP28 transceivers to configure 100-Gigabit Ethernet interfaces.
- If rate selectability is not configured, each port of the MPC7E-MRATE MPC operates as four 10-Gigabit Ethernet interfaces.

For more information about how to configure rate selectability, see [“Configuring Rate Selectability on MPC7E \(Multi-Rate\) to Enable Different Port Speeds” on page 201](#).

**Related Documentation**

- *Protocols and Applications Supported by the MPC7E for MX Series Routers*
- [Configuring Rate Selectability on MPC7E \(Multi-Rate\) to Enable Different Port Speeds on page 201](#)
- *MPC7E (Multi-Rate)*
- *Interface Naming Overview*
- [pic-mode on page 739](#)
- [speed on page 784](#)
- [number-of-ports on page 721](#)

## MPC7E 10G on MX Series Routers Overview

Starting with Junos OS Release 15.1F5, MX2020, MX2010, MX960, MX480, and MX240 routers support the Modular Port Concentrator (MPC) MPC7E 10G (MPC7E-10G). This is a fixed-configuration MPC with forty 10-Gbps Ethernet ports. To use the MPC7E 10G MPC on Junos OS Release 15.1F5, you must download and install the Junos Continuity software package for Junos OS Release 15.1F5.

**NOTE:**

- On MX2000 line of routers, MPC7E 10G is plugged into an adapter card. Therefore, to use the MPC7E 10G MPC on MX2000 line of routers, the adapter card must be installed on the routers.
- To operate MPC7E 10G on MX240, MX480, and MX960 routers, the routers must be equipped with high-capacity power supply, high-capacity fan tray, and Enhanced Switch Control Board SCBE2.

The main features of the MPC7E-MRATE MPC are the following:

- Line-rate throughput of up to 400 Gbps on MX240, MX480, MX960, MX2010, and MX2020 routers.
- Forty 10-Gigabit Ethernet ports. The ports support small-form factor pluggable plus (SFP+) transceivers.
- Support maximum transmission units (MTUs) from 256 bytes through 16,000 bytes.
- Supports [Hyper mode](#) to speed up packet processing.
- Supports [Flexible queuing](#) using an add-on license to support 32,000 queues per line card, including queues on both ingress and egress interfaces. You can use an additional license to support up to 512,000 queues.



**NOTE:** On MX240, MX480, and MX960 routers, MPC7E 10G powers on only if the **network-services** mode on the router is configured as either **enhanced-ip** or **enhanced-ethernet**. On MX2000 routers, no additional configuration is required because by default the router operates in **enhanced-ip** mode.

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For information about the supported and unsupported Junos OS features for this MPC, see *Protocols and Applications Supported by the MPC7E for MX Series Routers* in the *MX Series Line Card Guide*.

**Related  
Documentation**

- *MPC7E 10G*
- *Protocols and Applications Supported by the MPC7E for MX Series Routers*
- *Interface Naming Overview*

## MPC8E on MX Series Routers Overview

In Junos OS Release 15.1F5 and later, MX2020 and MX2010 routers support *MPC8E* (model number: MX2K-MPC8E), a new Modular Port Concentrator (MPC) with two Modular Interface Card (MIC) slots that provide a maximum bandwidth of 960 Gbps. Each MIC slot on MPC8E supports a 12-port rate selectable MIC (MIC-MRATE). MPC8E has four Packet Forwarding Engines, each providing a maximum bandwidth of 240 Gbps.



**NOTE:** To use the MPC8E MPC on Junos OS Release 15.1F5, you must download and install the Junos Continuity software package for Junos OS Release 15.1F5.

MPC8E plugs into the chassis and provides the fabric interface. The MX2000 line of routers can support eight Switch Fabric Boards (SFBs) and eight Enhanced Switch Fabric Boards (SFB2s) but not both at the same time. However, during an upgrade from SFB to SFB2, the MX2000 line of routers support both SFB and SFB2 at the same time for the duration of the upgrade.

Starting in Junos OS Release 17.4R1, MIC-MACSEC-MRATE with MACsec is supported on MPC8E to extend MACsec capabilities on MX2000 line of routers (MX2020, MX2010, MX2008). The MACsec feature increases the Data Center (DC) security and also for DC to DC secured connectivity. MIC-MACSEC-MRATE MIC enable 40G and 100G MACsec capability to the MPC8E. Each MPC supports two MIC-MACSEC-MRATE MICs. On an MPC8E, each MIC supports 48 10-Gigabit Ethernet, 12 40-Gigabit Ethernet, or 4 100-Gigabit Ethernet MACsec-capable interfaces, or a combination.



**NOTE:** Compared to other MICs, MIC-MACSEC-MRATE takes longer time (around 4 minutes) to boot as it is required to bring up two MICs in serial.

MPC8E supports:

- Line-rate throughput of up to 960 Gbps on the MX2000 line of routers.
- MIC-MRATE MICs with QSFP+ transceivers that support rate selectability at the port level and at the MIC level.
- Configuration of 4 ports out of the 12 MIC-MRATE ports as 100-Gigabit Ethernet ports.
- Configuration of PIC-based tunnel interfaces from the Junos OS CLI.
- Maximum transmission unit (MTU) size of 16,000 bytes for transit traffic.

MPC8E supports the following software features:

- [Dynamic power management](#) for effective utilization of available power.
- [Inline flow monitoring](#) for higher scalability and performance.

- **Flexible queuing** using an add-on license to support 32,000 queues per line card, including queues on both ingress and egress interfaces. You can use an additional license to support up to 512,000 queues per slot or 1,000,000 queues per slot.
- **Hyper mode** to speed up packet processing.
- MACsec MIC MRATE support for MX2000 line of routers. See [Understanding Media Access Control Security \(MACsec\) on MX Series Routers](#) for more details.

For more information about the supported and unsupported Junos OS features on MPC8E, see *Protocols and Applications Supported by the MPC8E and MPC9E on the MX2010 and MX2020 Routers* in the [MX Series Interface Module Reference](#).

## Upgrading MPC8E to Provide Increased Bandwidth

In Junos OS Release 16.1R1 and later, you can upgrade MPC8E to provide an increased bandwidth of 1600 Gbps (1.6 Tbps) by using an add-on license. After you purchase the license and perform the upgrade, MPC8E provides a bandwidth of 1.6 Tbps, which is equivalent to the bandwidth that MPC9E provides. However, the MPC continues to be identified as MPC8E.



**NOTE:** After you upgrade MPC8E to provide a bandwidth of 1.6 Tbps, the power consumption by MPC8E increases and is equivalent to the power that MPC9E consumes. See *MPC8E* for more information.

After you purchase the add-on license, you upgrade the bandwidth by using the **set chassis fpc slot bandwidth 1.6T** command. You can disable this feature by using the **delete chassis fpc slot bandwidth 1.6T** command.



**NOTE:** When you modify the bandwidth of MPC8E and commit the configuration, the MPC automatically reboots. For instance, if you upgrade MPC8E to provide a bandwidth of 1.6 Tbps and commit the configuration, the MPC automatically reboots. Also, if you disable the feature on MPC8E (to provide a bandwidth of 960 Gbps) and commit the configuration, the MPC automatically reboots.

Release History Table

Release	Description
17.4R1	Starting in Junos OS Release 17.4R1, MIC-MACSEC-MRATE with MACsec is supported on MPC8E to extend MACsec capabilities on MX2000 line of routers (MX2020, MX2010, MX2008).

### Related Documentation

- [Configuring Rate Selectability on MIC-MRATE to Enable Different Port Speeds on page 196](#)
- [Guidelines for Configuring Rate Selectability on page 179](#)



- *Junos Continuity Software User Guide (Junos OS Release 14.1R4 and Later Releases)*
- *Protocols and Applications Supported by the MPC8E and MPC9E on the MX2010 and MX2020 Routers*
- [Supported Active Physical Ports for Configuring Rate Selectability to Prevent Oversubscription on page 189](#)
- [Understanding Interface Naming Conventions for MIC-MRATE on page 182](#)
- [Understanding Rate Selectability on page 176](#)
- *enhanced-priority-mode*

## MPC9E on MX Series Routers Overview

In Junos OS Release 15.1F5 and later, the MX2000 line of routers support a new modular MPC, MPC9E (MX2K-MPC9E). MPC9E has two Modular Interface Card (MIC) slots. MPC9E has four Packet Forwarding Engines, each with forwarding capacity of up to 400 Gbps. MPC9E supports only the 12-port, rate-selectable MIC (MIC-MRATE).



**NOTE:** To use the MPC9E MPC on Junos OS Release 15.1F5, you must download and install the Junos Continuity software package for Junos OS Release 15.1F5.

Starting in Junos OS Release 17.4R1, MIC-MACSEC-MRATE with MACsec is supported on MPC9E to extend MACsec capabilities on MX2000 line of routers (MX2020, MX2010, MX2008). The MACsec feature increases the Data Center (DC) security and also for DC to DC secured connectivity. Each MPC supports two MIC-MACSEC-MRATE MICs. On an MPC9E, each MIC supports 48 10-Gigabit Ethernet, 12 40-Gigabit Ethernet, or 8 100-Gigabit Ethernet MACsec-capable interfaces, or a combination.



**NOTE:** Compared to other MICs, MIC-MACSEC-MRATE MIC takes longer time (around 4 minutes) to boot as it is required to bring up two MICs in serial.

MPC9E plugs into the chassis and provides the fabric interface. MX2000 line of routers can support eight Switch Fabric Boards (SFB) and eight Enhanced Switch Fabric Boards (SFB2) but not both at the same time. However, during an upgrade from SFB to SFB2, the MX2000 line of routers support both SFB and SFB2 at the same time for the duration of the upgrade.

- Line-rate throughput of up to 1.6 Tbps on the MX2000 line of routers.
- MIC-MRATE MICs with QSFP+ transceivers that support rate selectability at the port level and at the MIC level.
- Configuration of 8 ports out of the 12 MIC-MRATE ports as 100-Gigabit Ethernet ports.

- Configuration of PIC-based tunnel interfaces from the Junos OS CLI.
- Maximum transmission unit (MTU) size of 16,000 bytes for transit traffic.

MPC9E supports the following software features:

- [Dynamic power management](#) for effective utilization of available power.
- [Inline flow monitoring](#) for higher scalability and performance.
- [Flexible queuing](#) using an add-on license to support 32,000 queues per line card, including queues on both ingress and egress interfaces. You can use an additional license to support up to 512,000 queues per slot or 1,000,000 queues per slot.
- [Hyper mode](#) to speed up packet processing.
- MACsec MIC MRATE support for MX2000 line of routers. See [Understanding Media Access Control Security \(MACsec\) on MX Series Routers](#) for more details.

For more information about the supported and unsupported Junos OS features for this MPC, see *Protocols and Applications Supported by the MPC8E and MPC9E on the MX2010 and MX2020 Routers* in the [MX Series Interface Module Reference](#).

#### Release History Table

Release	Description
17.4R1	Starting in Junos OS Release 17.4R1, MIC-MACSEC-MRATE with MACsec is supported on MPC9E to extend MACsec capabilities on MX2000 line of routers (MX2020, MX2010, MX2008).

#### Related Documentation

- [Configuring Rate Selectability on MIC-MRATE to Enable Different Port Speeds on page 196](#)
- [Guidelines for Configuring Rate Selectability on page 179](#)
- *Junos Continuity Software User Guide (Junos OS Release 14.1R4 and Later Releases)*
- *Protocols and Applications Supported by the MPC8E and MPC9E on the MX2010 and MX2020 Routers*
- [Supported Active Physical Ports for Configuring Rate Selectability to Prevent Oversubscription on page 189](#)
- [Understanding Interface Naming Conventions for MIC-MRATE on page 182](#)
- [Understanding Rate Selectability on page 176](#)
- *enhanced-priority-mode*

## Tunnel Interfaces on MX Series Routers with MPC7E-10G, MPC7E-MRATE, MX2K-MPC8E, and MX2K-MPC9E

MPC7E-10G, MPC7E-MRATE, MX2K-MPC8E, and MX2K-MPC9E support a total of four inline tunnel interfaces per MPC, one per PIC. You can create a set of tunnel interfaces per PIC slot up to a maximum of four slots (from 0 through 3) on MX Series routers with these MPCs. These PICs are referred to as pseudo tunnel PICs. You create tunnel interfaces on MX Series routers with MPC7E-10G, MPC7E-MRATE, MX2K-MPC8E, and MX2K-MPC9E by including the following statements at the **[edit chassis]** hierarchy level:

```
[edit chassis]
fpc slot-number {
  pic number {
    tunnel-services {
      bandwidth ;
    }
  }
}
```

### Packet Forwarding Engine Mapping and Tunnel Bandwidth for MPC7E-MRATE

The tunnel bandwidth for MPC7E-MRATE is 1–120Gbps with an increment of 1Gbps. However, if you do not specify the bandwidth in the configuration, it is set to 120Gbps.

[Table 6 on page 22](#) shows the mapping between the tunnel bandwidth and the Packet Forwarding Engines for MPC7-MRATE.

**Table 8: Packet Forwarding Engine Mapping and Tunnel Bandwidth for MPC7E-MRATE**

Pseudo Tunnel PIC	Maximum Bandwidth per Tunnel PIC	PFE Mapping	Maximum Tunnel Bandwidth per PFE	Maximum PFE Bandwidth
PIC0	120Gbps	PFE0	120Gbps	240Gbps
PIC1	120Gbps			
PIC2	120Gbps	PFE1	120Gbps	240Gbps
PIC3	120Gbps			

### Packet Forwarding Engine Mapping and Tunnel Bandwidth for MPC7E-10G

The tunnel bandwidth for MPC7E-10G is 1–120Gbps with an increment of 1Gbps. However, if you do not specify the bandwidth in the configuration, it is set to 120Gbps.

[Table 9 on page 42](#) shows the mapping between the tunnel bandwidth and the Packet Forwarding Engines for MPC7E-10G.

**Table 9: Packet Forwarding Engine Mapping and Tunnel Bandwidth for MPC7E-10G**

Pseudo Tunnel PIC	Maximum Bandwidth per Tunnel PIC	PFE Mapping	Maximum Tunnel Bandwidth per PFE	Maximum PFE Bandwidth
PIC0	120Gbps	PFE0	120Gbps	200Gbps
PIC1	120Gbps			
PIC2	120Gbps	PFE1	120Gbps	200Gbps
PIC3	120Gbps			

### Packet Forwarding Engine Mapping and Tunnel Bandwidth for MX2K-MPC8E

The tunnel bandwidth for MX2K-MPC8E is 1– 120Gbps with an increment of 1Gbps. However, if you do not specify the bandwidth in the configuration, it is set to 120Gbps.

[Table 10 on page 42](#) shows the mapping between the tunnel bandwidth and the Packet Forwarding Engines for MX2K-MPC8E.

**Table 10: Packet Forwarding Engine Mapping and Tunnel Bandwidth for MX2K-MPC8E**

Pseudo Tunnel PIC	Maximum Bandwidth per Tunnel PIC	Packet Forwarding Engine Mapping	Maximum Tunnel Bandwidth per PFE	Maximum PFE Bandwidth
PIC0	120Gbps	PFE0	120Gbps	240Gbps
PIC1	120Gbps	PFE1	120Gbps	240Gbps
PIC2	120Gbps	PFE2	120Gbps	240Gbps
PIC3	120Gbps	PFE3	120Gbps	240Gbps

### Packet Forwarding Engine Mapping and Tunnel Bandwidth for MX2K-MPC9E

The tunnel bandwidth for MX2K-MPC9E is 1– 200Gbps with an increment of 1Gbps. However, if you do not specify the bandwidth in the configuration, it is set to 200Gbps.

[Table 11 on page 42](#) shows the mapping between the tunnel bandwidth and the Packet Forwarding Engines for MX2K-MPC9E.

**Table 11: Packet Forwarding Engine Mapping and Tunnel Bandwidth for MX2K-MPC9E**

Pseudo Tunnel PIC	Maximum Bandwidth per Tunnel PIC	Packet Forwarding Engine Mapping	Maximum Tunnel Bandwidth per PFE	Maximum PFE Bandwidth
PIC0	200Gbps	PFE0	200Gbps	400Gbps
PIC1	200Gbps	PFE1	200Gbps	400Gbps
PIC2	200Gbps	PFE2	200Gbps	400Gbps

Table 11: Packet Forwarding Engine Mapping and Tunnel Bandwidth for MX2K-MPC9E (continued)

Pseudo Tunnel PIC	Maximum Bandwidth per Tunnel PIC	Packet Forwarding Engine Mapping	Maximum Tunnel Bandwidth per PFE	Maximum PFE Bandwidth
PIC3	200Gbps	PFE3	200Gbps	400Gbps

- Related Documentation**
- [tunnel-services on page 817](#)
  - [bandwidth on page 606](#)

## MX10003 MPC on MX10003 Router Overview

In Junos OS Release 17.3R1 and later, the MX10003 router supports a new Modular Port Concentrator (MPC), MX10003 MPC. Each MPC supports a Multi-Rate 12xQSFP28 Ethernet Modular Interface Card (MIC) (model numbers: JNP-MIC1 (in Junos OS Release 17.3R1) and JNP-MIC1-MACSEC (in Junos OS Release 17.3R2)) and the fixed-port PIC (6xQSFP). The router provides two dedicated line-card slots for MPCs. MPCs install into the line-card slots. The fixed-port PIC is mapped to PIC 0, and each Packet Forwarding Engine is mapped to two ports in PIC 0. The Multi-Rate 12xQSFP28 Ethernet MIC is mapped to PIC 1, and each Packet Forwarding Engine is mapped to four ports in PIC 1. On the MIC all 12 ports are active and are capable of running in 40-Gigabit Ethernet, 100-Gigabit Ethernet, and 4x10-Gigabit Ethernet mode.

The MX10003 MPC supports:

- Line-rate throughput of up to 1.2 Tbps on the MX10003 routers.
- MICs with QSFP+/QSFP28 transceivers that are rate-selectable at the port level and at the MIC level.
- Configuration of all 12 ports of the MIC as 100-Gigabit Ethernet ports.
- Configuration of PIC-based tunnel interfaces from the Junos OS CLI.
- Maximum transmission unit (MTU) size of 16,000 bytes for transit traffic.

The MX10003 MPC supports the following software features:

- [Dynamic power management](#) for effective utilization of available power.
- [Inline flow monitoring](#) for higher scalability and performance.
- [Hyper mode](#) to speed up packet processing.

- Related Documentation**
- [MX10003 MPC Rate-Selectability Overview on page 205](#)
  - [Supported Active Physical Ports for Configuring Rate Selectability to Prevent Oversubscription on MX10003 MPC on page 192](#)
  - [Protocols and Applications Supported by the MX10003 MPC \(Multi-Rate\) on the MX10003 Router](#)

## JNP10K-LC2101 MPC on MX10008 Routers Overview

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In Junos OS Release 18.2R1 and later, MX10008 routers support a new MPC, JNP10K-LC2101. JNP10K-LC2101 is a fixed-configuration MPC that provides increased port density and performance to the MX10008 routers. JNP10K-LC2101 does not contain separate slots for Modular Interface Cards (MICs) and has six Packet Forwarding Engines.

MX10008 routers support eight JNP10K-LC2101 MPCs. By default, each JNP10K-LC2101 MPC provides a maximum bandwidth of 2.4Tbps. JNP10K-LC2101 has six Packet Forwarding Engines, each providing a maximum bandwidth of up to 400 Gbps, which cannot be oversubscribed. JNP10K-LC2101 MPC plugs into the chassis and provides the fabric interface. The MX10008 router supports six Switch Fabric Boards (SFBs).

The MX10008 router supports only **enhanced-ip** and **enhanced-ethernet** network services mode. The default network services mode is **enhanced-ip**.

JNP10K-LC2101 supports:

- Multi-rate ports. The ports on the JNP10K-LC2101 MPC support multiple port speeds such as 10Gbps, 40 Gbps, and 100 Gbps. Hence, they are known as multi-rate ports. All ports support all port speeds. To view the port speed information for each port, use the **show chassis pic fpc-slot *fpc-slot-number* pic-slot *pic-slot-number*** command.
- PIC-based tunnel configuration
- Maximum Transmission Unit (MTU) size of 16000 bytes for transit traffic.
- [Dynamic Power Management](#) for effective utilization of available power.
- [Flexible queuing](#) supports 128,000 queues per line card, including queues on both ingress and egress interfaces. You can use an additional license to support up to 256,000 queues or 1,500,000 queues per slot.

For more information about the supported and unsupported Junos OS features on JNP10K-LC2101, see *Protocols and Applications Supported by the JNP10K-LC2101 on the MX10008 Routers* in the [MX Series Interface Module Reference](#).

## Downgrading JNP10K-LC2101 to Provide Decreased Bandwidth

You can downgrade the JNP10K-LC2101 MPC to provide a decreased bandwidth of 1.44Tbps. After you perform the downgrade, JNP10K-LC2101 provides a bandwidth of 1.44Tbps. Each of the six Packet Forwarding Engines now provide a maximum bandwidth of up to 240 Gbps, which cannot be oversubscribed.

You can downgrade the bandwidth by using the **set chassis fpc slot bandwidth 1.44T** command. You can disable this feature by using the **delete chassis fpc slot bandwidth 1.44T** command.



**NOTE:** When you modify the bandwidth of JNP10K-LC2101 and commit the configuration, the MPC automatically reboots. For instance, if you downgrade JNP10K-LC2101 to provide a bandwidth of 1.44 Tbps and commit the configuration, the MPC automatically reboots. Also, if you disable the feature on JNP10K-LC2101 (to provide a bandwidth of 2.4Tbps) and commit the configuration, the MPC automatically reboots.

**Related Documentation**

- [Remote Port Identification using LEDs for Cabling Assistance on page 70](#)
- [Understanding How Dynamic Power Management Enables Better Utilization of Power on page 103](#)
- [Understanding How Configuring Ambient Temperature Helps Optimize Power Utilization on page 104](#)

## MX204 Router Overview

Starting with Release 17.4R1, Junos OS supports the MX204 Universal Routing Platform (model number: JNP204 [MX204]). The MX204 chassis is a monolithic system— that is, it does not have separate Switch Processor Mezzanine Boards and line cards. All the router components including Packet Forwarding Engines and WAN interfaces are managed by the CPU subsystem (consisting of an eight-core Broadwell CPU). The MX204 delivers a throughput of up to 400 Gbps.

The MX204 router is a fixed-configuration router, and supports one fixed Routing Engine. It contains a total of twelve fixed ports, in two groups of four and eight, respectively. The set of four ports (referred to as the PIC 0 ports) are rate selectable and can be configured at 10-Gbps (by using a breakout cable), 40-Gbps, or 100-Gbps speed. However, not all the ports support all the three speeds. The set of eight ports (referred to as PIC 1 ports) operate at a fixed speed of 10-Gbps. The four rate-selectable ports support QSFP28 and QSFP+ transceivers, whereas the eight 10-Gigabit Ethernet ports support SFP+ transceivers.

See “MX204 Router Rate-Selectability Overview” on page 210 and “Supported Active Physical Rate-Selectable Ports to Prevent Oversubscription on MX204 Router” on page 193 for more details.

**Related Documentation**

- [Configuring Rate Selectability on MX204 to Enable Different Port Speeds on page 220](#)
- [MX204 LED Scheme Overview on page 74](#)

## Flexible Queuing Mode Overview

The queuing component on non-HQoS MPCs is disabled by default to save power. When flexible queuing is enabled on a non-HQoS MPC, the MPC is restarted with the queuing component enabled. The MPC is powered on only if the PEM has sufficient power to bring

up the MPC with the queuing component enabled. The MPC remains offline if the required power is not available.

You can enable flexible queuing on the non-HQoS MPCs by including the [flexible-queuing-mode](#) statement at the `[edit chassis fpc]` hierarchy level. When queuing is configured, the power consumed by the queuing components at the configured ambient temperature is considered when power is allocated for the MPC.



**NOTE:** The following MICs are supported on non-HQoS MPCs only when flexible queuing is enabled:

- MIC-3D-8CHOC3-4CHOC12
- MIC-3D-4CHOC3-2CHOC12
- MIC-4COC3-2COC12-G
- MIC-2COC3-1COC12-G

[Table 12 on page 46](#) lists the MPCs that support flexible queueing and the supported Junos OS release for these MPCs.

**Table 12: MPCs and the Junos OS Release that Support Flexible Queueing**

MPCs	First Supported Junos OS Release
MPC2E-3D-NG	15.1R1
MPC3E-3D-NG	15.1R1
MPC5E	14.1R1
MPC7E-MRATE	15.1F4
MPC7E-10G	15.1F5
MPC8E	
MPC9E	

**Related Documentation**

- [flexible-queuing-mode on page 652](#)
- [MPC5E on MX Series Routers Overview on page 29](#)
- [MPC3E on MX Series Routers Overview on page 23](#)

## Upgrading non-HQoS MPCs to Support Flexible Queueing

You can enable flexible queuing on a non-HQoS MPC to support a maximum of up to 32,000 queues per port and per card, including queues on both ingress and egress interfaces.



This topic describes how to enable flexible queuing on a non-HQoS MPC.

To configure flexible queuing on non-HQoS MPCs:

1. Run the **set chassis fpc slot-number flexible-queuing-mode** configuration mode command.

For example, to configure flexible queuing on an MPC in slot 2:

```
[edit]
user@router# set chassis fpc 2 flexible-queuing-mode
```



**NOTE:** When flexible queuing is enabled, the MPC is restarted with the queuing component enabled. The MPC comes online only if the power entry module (PEM) has sufficient power to bring up the MPC with the queuing component enabled. The MPC remains offline if the required power is not available in the PEM.

2. Review your configuration and issue the **commit** command.

```
[edit]
user@router# commit
[edit]
'chassis fpc'
  WARNING: FPC configuration for flexible-queuing is changed. FPC would
  undergo reboot to enable flexible-queuing. FPC would come online only if power
  available is sufficient to enable queuing components.
commit complete
```

**Related Documentation**

- [flexible-queuing-mode on page 652](#)

## Disabling Flexible Queuing for non-HQoS MPCs to Optimize Power Utilization

You can optimize power utilization by disabling flexible queuing on a non-HQoS MPC.

This topic describes how to disable flexible queuing on a non-HQoS MPC.

1. Run the **delete chassis fpc slot-number flexible-queuing-mode** command at the **[edit chassis]** hierarchy level.

For example, to disable flexible queuing on an MPC in slot 2:

```
[edit]
user@router# delete chassis fpc 2 flexible-queuing-mode
```

2. Review your configuration and issue the **commit** command.

```
[edit]
user@router# commit
commit complete

[edit]
user@router#
```

**Related Documentation** • [flexible-queuing-mode on page 652](#)

## Understanding the Hyper Mode Feature on Enhanced MPCs for MX Series Routers and EX9200 Switches

Starting with Junos OS Release 15.1, enhanced MPCs can be configured to support increased packet processing rates. Enhanced MPCs include these models: MPC3E, MPC4E, MPC5E, MPC6E, MPC7E-MRATE, MPC7E-10G, MX2K-MPC8E, and MX2K-MPC9E.

Starting with Junos OS Release 18.2R1, MPC JNP10K-LC2101 can be configured to support increased packet processing rates. A higher rate of processing of data packets results in the optimization of the lifetime of a data packet. Optimization of the data packet lifetime enables the network device (a router or a switch) to provide better performance and throughput.

To enable the device to support increased packet processing rates, you must configure the hyper mode feature. After configuring the hyper mode feature, you must reboot the device for the changes to take effect.

When you configure the hyper mode feature on the device, the configured mode changes from normal mode to hyper mode. However, because the configuration does not take effect until you reboot the device the current mode of the device remains as normal mode. The current mode changes from normal mode to hyper mode after you reboot the device. If the hyper mode feature is not configured, the device processes data packets in normal mode.



**NOTE:** You can enable the hyper mode feature only if the network-service mode on the device is configured as either **enhanced-ip** or **enhanced-ethernet**.

[Table 13 on page 48](#) displays the values of the current and configured mode based on the hyper mode configuration and system reboot.

**Table 13: Current Mode and Configured Mode Values Based on Hyper mode Configuration**

Action	Current Mode	Configured Mode
Hyper mode is configured but the device is not rebooted.	Normal mode	Hyper mode
Hyper mode is configured and device is rebooted.	Hyper mode	Hyper mode
Hyper mode configuration is removed and device is not rebooted.	Hyper mode	Normal mode

**Table 13: Current Mode and Configured Mode Values Based on Hyper mode Configuration (continued)**

Action	Current Mode	Configured Mode
Hyper mode configuration is removed and device is rebooted.	Normal mode	Normal mode

When you configure hyper mode, the following features are not supported:

- Creation of Virtual Chassis
- Forwarding class accounting (enhanced mode)
- Interoperability with legacy DPCs, including MS-DPCs. The MPC in hyper mode accepts and transmits data packets only from other existing MPCs.
- Interoperability with non-Ethernet MICs and non-Ethernet Interfaces such as channelized interfaces, multilink interfaces, and SONET interfaces.
- Junos Fusion
- Node Virtualization
- Padding of Ethernet frames with VLAN.
- Provider Backbone Bridging (PBB) and Ethernet VPN (EVPN)
- Sending Internet Control Message Protocol (ICMP) redirect messages. ICMP redirects are disabled by default and cannot be re-enabled in hyper mode.
- Termination or tunneling of all subscriber-based services.

After you configure the hyper mode feature and reboot the device, existing MPCs that do not support the hyper mode feature, such as MPC1, MPC2, and MPC3, power on in normal mode. Also, when you have installed MICs and PICs on MPCs that are in normal mode when the hyper mode feature is enabled, those MICs and PICs do not power on. Following is a list of the MICs and PICs that do not power on:

- *Channelized E1/T1 Circuit Emulation MIC*
- *Channelized E1/T1 Circuit Emulation MIC (H)*
- *Channelized OC3/STM1 (Multi-Rate) Circuit Emulation MIC with SFP*
- *Channelized OC3/STM1 (Multi-Rate) Circuit Emulation MIC with SFP (H)*
- *Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP*
- *DS3/E3 MIC*
- *SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP*
- *SONET/SDH OC192/STM64 MIC with XFP*
- *Channelized OC48/STM16 Enhanced IQ (IQE) PIC with SFP*

## Release History Table

Release	Description
18.2R1	Starting with Junos OS Release 18.2R1, MPC JNP10K-LC2101 can be configured to support increased packet processing rates.
15.1	Starting with Junos OS Release 15.1, enhanced MPCs can be configured to support increased packet processing rates.

## Related Documentation

- [Configuring Hyper Mode on Enhanced MPCs to Speed Up Packet Processing on page 50](#)
- [Unsupported Features and CLI Commands When Hyper Mode Is Enabled on page 51](#)
- *show forwarding-options hyper-mode*
- *hyper-mode (forwarding-options)*

## Configuring Hyper Mode on Enhanced MPCs to Speed Up Packet Processing

Starting with Junos OS Release 15.1, enhanced MPCs can be configured to support increased packet processing rates. Enhanced MPCs include these models: MPC3E, MPC4E, MPC5E, MPC6E, MPC7E-MRATE, MPC7E-10G, MX2K-MPC8E, and MX2K-MPC9E.

Starting with Junos OS Release 18.2R1, JNP10K-LC2101 MPC can be configured to support increased packet processing rates. A higher rate of processing of data packets results in the optimization of the lifetime of a data packet. Optimization of the data packet lifetime enables the network device (a router or a switch) to provide better performance and throughput.

To configure the device to support increased packet processing rates, you must configure the hyper mode feature. After configuring the hyper mode feature, you must reboot the device for the changes to take effect. If the hyper mode feature is not configured, the device processes data packets in normal mode.



**NOTE:** You can enable the hyper mode feature only if the network-service mode on the device is configured as either enhanced-ip or enhanced-ethernet.

To configure hyper mode on enhanced MPCs to speed up packet processing:

1. Configure hyper mode by including the **forwarding-options hyper-mode** statement at the [edit] hierarchy level.

```
[edit]
user@host# set forwarding-options hyper-mode
```

2. After configuring hyper mode, commit the configuration.

```
[edit]
```

```
user@host# commit
```



**NOTE:** After configuring hyper mode and committing the configuration, the configured mode changes to hyper-mode but the current mode remains as normal mode. The device displays the following warning message after you commit the configuration:

```
[edit forwarding-options]
```

```
'hyper-mode'
```

**WARNING:** forwarding-options hyper-mode configuration changed. A system reboot is mandatory. Please reboot the system NOW. Continuing without a reboot might result in unexpected system behavior. commit complete

3. Reboot the device for the configuration to take effect.

```
user@host> request system reboot
```

Release History Table

Release	Description
18.2R1	Starting with Junos OS Release 18.2R1, JNP10K-LC2101 MPC can be configured to support increased packet processing rates.
15.1	Starting with Junos OS Release 15.1, enhanced MPCs can be configured to support increased packet processing rates.

#### Related Documentation

- [Understanding the Hyper Mode Feature on Enhanced MPCs for MX Series Routers and EX9200 Switches on page 48](#)
- [Unsupported Features and CLI Commands When Hyper Mode Is Enabled on page 51](#)
- *show forwarding-options hyper-mode*
- *hyper-mode (forwarding-options)*

## Unsupported Features and CLI Commands When Hyper Mode Is Enabled

Table 14 on page 52 lists the features and corresponding CLI commands that are not supported when the hyper mode feature is enabled. Also, the table lists the error messages displayed when you use the unsupported commands.

Table 14: Unsupported Features and CLI Commands When Hyper Mode Is Enabled

Features	Commands	Error Message
Virtual Chassis	set virtual-chassis preprovisioned	To configure virtual-chassis, 'forwarding-options hyper-mode' should not be configured
	set virtual-chassis member <i>member-id</i> role <i>role</i> serial-number <i>ser_num</i>	
	set virtual-chassis no-split-detection	
ICMP Redirect	set system no-redirects	To configure system no-redirects, 'forwarding-options hyper-mode' should not be configured
	set system no-redirects-ipv6	To configure system no-redirects-ipv6, 'forwarding-options hyper-mode' should not be configured
	set interface <i>interface-name</i> unit <i>unit</i> family inet no-redirects	To configure family inet no-redirects, 'forwarding-options hyper-mode' should not be configured
	set interface <i>interface-name</i> unit <i>unit</i> family inet6 no-redirects	To configure family inet6 no-redirects, 'forwarding-options hyper-mode' should not be configured
VLAN Ethernet Padding	set interfaces <i>interface-name</i> gigether-options pad-to-minimum-frame-size	To configure gigether-options pad-to-minimum-frame-size, 'forwarding-options hyper-mode' should not be configured
	set interfaces <i>interface-name</i> aggregate-ether-options pad-to-minimum-frame-size	To configure aggregate-ether-options pad-to-minimum-frame-size, 'forwarding-options hyper-mode' should not be configured
PPPoE	set interface <i>interface-name</i> unit <i>unit</i> encapsulation ppp-over-ether	Can't configure protocol family with encapsulation ppp-over-ether or hyper-mode should not be configured
	set interface <i>interface-name</i> unit <i>unit</i> family pppoe	To configure family pppoe, 'forwarding-options hyper-mode' should not be configured
	set protocols pppoe service-name-tables <i>table-name</i>	To configure pppoe, 'forwarding-options hyper-mode' should not be configured
	set dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>unit</i> family pppoe	To configure family pppoe, 'forwarding-options hyper-mode' should not be configured
	set dynamic-profiles <i>profile-name</i> interfaces demux0 unit <i>unit</i> family pppoe	To configure family pppoe, 'forwarding-options hyper-mode' should not be configured
L2TP	set access tunnel-profile <i>profile-name</i> tunnel <i>tunnel-id</i> tunnel-type l2tp	To configure l2tp, 'forwarding-options hyper-mode' should not be configured
	set services l2tp	To configure services l2tp, 'forwarding-options hyper-mode' should not be configured

- Related Documentation**
- [Configuring Hyper Mode on Enhanced MPCs to Speed Up Packet Processing on page 50](#)
  - [Understanding the Hyper Mode Feature on Enhanced MPCs for MX Series Routers and EX9200 Switches on page 48](#)
  - *show forwarding-options hyper-mode*
  - *hyper-mode (forwarding-options)*

## License Modes for Enhanced MPCs Overview

Enhanced MPCs are available in three license variants. Before Junos OS Release 16.1, there were two variants: infrastructure routing (IR) and routing (R). Starting in Junos OS Release 16.1, there is also a base variant, making a total of three license variants. All variants support an identical feature set, but with a few scale differences. [Table 15 on page 54](#) describes the three license variants.

**Table 15: License Variants for MPCs**

License	How to Identify	Description
base	No special suffix in the license name.	<ul style="list-style-type: none"> <li>All Layer 2, Layer 2.5, and Layer 3 features.</li> <li>Up to 32 Layer 3 routing instances of the virtual routing and forwarding (VRF) instance. The VRF support includes Layer 3 VPN (L3VPN).</li> <li>Up to 2 million routes in the forwarding information base (FIB), provided there is hardware support. (FIB is also known as forwarding table.)</li> <li>Up to 6 million routes in the routing information base (RIB), also known as routing table.</li> </ul>
IR	-IR suffix in the license name.	<ul style="list-style-type: none"> <li>All Layer 2, Layer 2.5, and Layer 3 features.</li> <li>Up to 32 Layer 3 routing instances of the virtual routing and forwarding (VRF) instance. The VRF support includes Layer 3 VPN (L3VPN).</li> </ul>
R	-R suffix in the license name.	Full-scale Layer 2, Layer 2.5, and Layer 3 features. Scale is determined by the hardware capabilities.

Suppose you have purchased two MPC4Es: one with IR license and one with R license. After the MPCs are installed on a router, both MPCs appear identical. To distinguish between an MPC with an IR license and an MPC with an R license after the MPC is installed on the router, you must configure the license mode based on the license purchased. For instance, if you have purchased an MPC with the IR license, you must configure the license mode for that MPC as IR. The license mode settings are set specific to each MPC slot. If the MPC is installed in a different slot, or moved to another device, the license mode settings must be reconfigured on the new slot or device. Also, the license mode settings previously configured must be deleted.



**NOTE:** The license mode settings are used only to provide information. You cannot set or alter the license of the MPC by configuring the license mode.

To view the current license mode settings on an MPC, from the configuration mode, use the **show chassis fpc** command. To view the current license mode settings on an MPC, from the operational mode, use the **show chassis hardware extensive** command. To delete the existing license mode settings on an MPC, use the **delete chassis fpc** command.



## Release History Table

Release	Description
16.1	Starting in Junos OS Release 16.1, there is also a base variant, making a total of three licence variants.

## Related Documentation

- *Junos OS Feature License Keys*
- *License Enforcement*
- *Configuring the JET Application and its License on a Device Running Junos OS*

## Configuring the License Mode for Specific Enhanced MPCs on MX Series Routers

Starting with Junos OS Release 14.2, you can set the license mode for enhanced MPCs such as MPC4E, MPC5E, and MPC6. Configuring the license mode enables you to distinguish between an MPC with an IR license and an MPC with an R license after the MPC is installed on the router. An MPC with an R license supports all the Layer 2, Layer 2.5, and Layer 3 features. An MPC with an IR license offers partial support for these features. For more information about the license variants, see [“License Modes for Enhanced MPCs Overview” on page 54](#)



**NOTE:** The license mode settings are used only to provide information. You cannot set or alter the license of the MPC when you configure the license mode.

Before you configure the license mode of the MPC, verify the license of the MPC. You will need this information to configure the license mode.

Do not try to set the license mode while the card is rebooting or the following error message will appear: **Card not online or TRIO/DPC based.**

To configure the license mode for MPCs on MX Series routers:

1. Configure the license mode for the MPC in a specified MPC slot.

If the MPC has an IR license, configure the license mode as IR. If the MPC has an R license, configure the license mode of the MPC as R.

```
[edit]
user@host# set chassis fpc slot-number ir-mode ir-mode
```

2. In configuration mode, verify the configuration, for example:

```
[edit]
user@host# show chassis
fpc 1 {
  ir-mode IR;
}
```

- After verifying the license mode, commit the changes by using the **commit** statement.

```
[edit]
user@host# commit
```

#### Release History Table

Release	Description
14.2	Starting with Junos OS Release 14.2, you can set the license mode for enhanced MPCs such as MPC4E, MPC5E, and MPC6.

#### Related Documentation

- *Junos OS Feature License Keys*
- *License Enforcement*
- *Configuring the JET Application and its License on a Device Running Junos OS*

### Example: Configuring the License Mode for MPC5E

This example describes how to configure the license mode for MPC5E on the MX480 router. It also describes how to remove the license mode settings and reconfigure the license mode settings on a new slot.

- [Requirements on page 56](#)
- [Overview on page 56](#)
- [Configuration on page 57](#)
- [Verification on page 59](#)

#### Requirements

This example uses the following hardware and software components:

- Junos OS Release 14.2 or later for MX Series routers
- A single MX480 router with MPC5E with R license

#### Overview

Configuring the license mode for an MPC enables you to distinguish between an MPC with an IR license and an MPC with an R license after the MPC is installed on the router.



**NOTE:** The license mode settings are used only to provide information. You cannot set or alter the license of the MPC when you configure the license mode.

The license mode settings are set specific to each MPC slot. If the MPC is installed in a different slot, or moved to another device, the license mode settings must be reconfigured on the new slot or device. Also, the license mode settings configured previously must be

removed. You can view the license mode settings from both configuration mode and operational mode.

### Topology

In this example, an MPC5E is installed in slot 4 of an MX480 router and has an R license. The R license indicates that all Layer 2, Layer 2.5, and Layer 3 features are supported on the MPC. You first configure the license mode of the MPC5E in slot 4 to R. After configuring the license mode, you can verify the license mode settings. You then install the MPC5E in slot 2 of the same router. License mode settings are set specific to each MPC slot. Therefore, the license mode setting must be reconfigured. After you move the MPC5E, delete the license mode setting on slot 4 and then reconfigure the license mode setting on slot 2.

## Configuration

To configure the license mode for the MPC5E according to the topology specified in the overview section, perform these tasks:

- [Configuring the License Mode for MPC5E in Slot 4 on page 57](#)
- [Deleting the License Mode for MPC5E in Slot 4 on page 58](#)
- [Configuring the License Mode for MPC5E in Slot 2 on page 58](#)

### Configuring the License Mode for MPC5E in Slot 4

#### Step-by-Step Procedure

To configure the license mode for the MPC5E in slot 4:

1. Configure the license mode R for the MPC5E in slot 4:

```
[edit]
user@host# set chassis fpc 4 ir-mode R
```

2. In configuration mode, verify the configuration.

```
user@host# show chassis fpc 4
pic 0 {
  power off;
}
pic 1 {
  power off;
}
ir-mode R;
```

3. After verifying the license mode, commit the changes by using the **commit** statement.

```
[edit]
user@host# commit
```

### Deleting the License Mode for MPC5E in Slot 4

---

#### Step-by-Step Procedure

To delete the license mode R for the MPC5E in slot 4:

1. Delete the license mode for the MPC5E.

```
[edit]
user@host# delete chassis fpc 4 ir-mode R
```

2. In configuration mode, verify the configuration.

```
user@host# show chassis fpc 4
pic 0 {
  power off;
}
pic 1 {
  power off;
}
```

3. After verifying the license mode, commit the changes by using the **commit** statement.

```
[edit]
user@host# commit
```

### Configuring the License Mode for MPC5E in Slot 2

---

#### Step-by-Step Procedure

To configure the license mode for the MPC5E in slot 2:

1. Configure the license mode R for the MPC5E.

```
[edit]
user@host# set chassis fpc 2 ir-mode R
```

2. In configuration mode, verify the configuration.

```
user@host# show chassis fpc 2
pic 0 {
  power off;
}
pic 1 {
  power off;
}
ir-mode R;
```

3. After verifying the license mode, commit the changes by using the **commit** statement.

```
[edit]
```

```
user@host# commit
```

## Verification

To confirm that you have accurately configured the license mode settings on MPC5E, perform these tasks:

- [Verifying That License Mode Is Configured for MPC5E in Slot 4 on page 59](#)
- [Verifying That the Configured License Mode Is Deleted on page 59](#)
- [Verifying That the License Mode Is Configured for MPC5E in Slot 2 on page 60](#)

### Verifying That License Mode Is Configured for MPC5E in Slot 4

**Purpose** To verify that license mode R is configured for the MPC5E in slot 4.

**Action** From operational mode, enter the **show chassis hardware extensive** command.

```
user@host> show chassis hardware extensive
```

```
...
FPC 4          REV 30   750-045715   CABM2612          MPC5E 3D Q 24XGE+6XLGE
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-045715      S/N:              CABM2612
Assembly ID:   0x0b8a          Assembly Version:  01.30
Date:          08-27-2013      Assembly Flags:    0x00
Version:       REV 30          CLEI Code:         PROTOXCLEI
ID: MPC5E 3D Q 24XGE+6XLGE     FRU Model Number:  PROTO-ASSEMBLY
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 fe 0b 8a 01 1e 52 45 56 20 33 30 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 34 35 37 31 35 00 00
  Address 0x20: 53 2f 4e 20 43 41 42 4d 32 36 31 32 00 1b 08 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
  Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff
R/IR Mode: R
...
```

**Meaning** License mode **R** is configured for the MPC5E in slot 4.

### Verifying That the Configured License Mode Is Deleted

**Purpose** To verify that the configured license mode is deleted.

**Action** From operational mode, enter the **show chassis hardware extensive** command.

```
user@host> show chassis hardware extensive
...
FPC 4          REV 30   750-045715   CABM2612          MPC5E 3D Q 24XGE+6XLGE
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-045715      S/N:              CABM2612
Assembly ID:   0x0b8a          Assembly Version:  01.30
Date:          08-27-2013      Assembly Flags:    0x00
Version:       REV 30          CLEI Code:         PROTOXCLEI
ID: MPC5E 3D Q 24XGE+6XLGE     FRU Model Number:  PROTO-ASSEMBLY
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 fe 0b 8a 01 1e 52 45 56 20 33 30 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 34 35 37 31 35 00 00
  Address 0x20: 53 2f 4e 20 43 41 42 4d 32 36 31 32 00 1b 08 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
  Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff
...
```

**Meaning** The license mode setting has been removed for the MPC5E in slot 4.

### Verifying That the License Mode Is Configured for MPC5E in Slot 2

**Purpose** To verify that license mode R is configured for the MPC5E in slot 2.

**Action** From operational mode, enter the **show chassis hardware extensive** command.

```
user@host> show chassis hardware extensive
...
FPC 2          REV 30   750-045715   CABM2612          MPC5E 3D Q 24XGE+6XLGE
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-045715      S/N:              CABM2612
Assembly ID:   0x0b8a          Assembly Version:  01.30
Date:          08-31-2013      Assembly Flags:    0x00
Version:       REV 30          CLEI Code:         PROTOXCLEI
ID: MPC5E 3D Q 24XGE+6XLGE     FRU Model Number:  PROTO-ASSEMBLY
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 fe 0b 8a 01 1e 52 45 56 20 33 30 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 34 35 37 31 35 00 00
  Address 0x20: 53 2f 4e 20 43 41 42 4d 32 36 31 32 00 1b 08 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
  Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff
R/IR Mode: R
...
```

**Meaning** License mode **R** is configured for the MPC5E in slot 2.

- Related Documentation**
- *Junos OS Feature License Keys*
  - *License Enforcement*
  - *Configuring the JET Application and its License on a Device Running Junos OS*

## Configuring the Number of Active Ports on 16-Port MPCs of MX Series Routers

You can disable a sub-set of the physical ports available on the Packet Forwarding Engines of the 16x10GE 3D MPC, and for PICs installed in MPC3, MPC4, MPC5, and MPC6.

Two of the most common reasons for disabling ports are explained below.

- **Ensure guaranteed bandwidth by preventing oversubscription**—The 16x10GE 3D MPC supports one 10-Gigabit Ethernet tunnel interface for each Packet Forwarding Engine. The effective line-rate bandwidth of the MPC is 12 ports because of an oversubscription ratio of 4:3. Therefore, configuring a tunnel interface might further result in the Packet Forwarding Engines being oversubscribed. To prevent such oversubscription and to ensure a guaranteed bandwidth, include the **number-of-ports** configuration statement to disable one or two ports per Packet Forwarding Engine.
- **Enable Switch Control Board (SCB) redundancy**—For maximum bandwidth capabilities (12-port line-rate bandwidth), the 16x10GE 3D MPC uses all the available SCBs (three SCBs for an MX960 router, two SCBs for an MX480 or MX240 router) actively in the chassis.

If SCB redundancy (2+1 SCBs on an MX960 router or 1+1 SCB on an MX480 or MX240 router) is required, ports on the line card can be disabled by setting the number of usable ports per line card to 8. In such a case, the third and fourth ports (ports 0/2-3, 1/2-3, 2/2-3, 3/2-3) on every Packet Forwarding Engine are disabled.

To configure the number of active ports on the 16x10GE 3D MPC, include the **number-of-ports active-ports** configuration statement at the **[edit chassis fpc slot-number]** hierarchy level:

```
[edit chassis fpc slot-number]
number-of-ports (8 | 12);
```

To configure the number of active ports on a PIC in an MPC3, MPC4, MPC5, or MPC6, include the **number-of-ports active-ports** configuration statement at the **[edit chassis fpc slot-number pic pic-number]** hierarchy level:

```
[edit chassis fpc slot-number pic pic-number]
number-of-ports (8 | 12);
```

Specify either 8 or 12 ports using this statement. When eight active ports are configured, two ports per Packet Forwarding Engine are disabled, and the LEDs on the MPC are set

to **yellow**. When you specify 12 active ports, one port per Packet Forwarding Engine is disabled and the corresponding LED is set to **yellow**. When you do not include this statement in the configuration, all 16 default ports on the MPC are active.



NOTE:

- Committing the configuration after including the `number-of-ports active-ports` configuration statement brings down the Ethernet interfaces for all the ports on the MPC before the ports configuration becomes active.
- A minimum of one high-capacity fan tray is necessary for meeting the cooling requirements of the MPC. The Junos OS generates a chassis yellow alarm recommending fan tray upgrade for optimal performance, if the MX router chassis contains an old fan tray.

For more information about the 16x10GE 3D MPC, see the [MX Series Interface Module Reference](#).

Related Documentation

- [16-Port 10-Gigabit Ethernet MPC on MX Series Routers \(16x10GE 3D MPC\) Overview on page 6](#)
- [Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 366](#)
- [Tunnel Interface Configuration on MX Series Routers Overview](#)
- [number-of-ports on page 721](#)

## Configuring Tunnel Interfaces on an MX Series Router with a 16x10GE 3D MPC

MX960, MX480, and M240 routers support the 16-port 10-Gigabit Ethernet MPC (16x10GE 3D MPC) fixed configuration Field Replaceable Unit (FRU). Each Packet Forwarding Engine on a 16x10GE MPC can support a full-duplex 10Gbps tunnel without losing line-rate capacity. For example, a full-duplex 10Gbps tunnel can be hosted on a 10-Gigabit-Ethernet port, while two other 10-Gigabit-Ethernet ports on the same PFE can concurrently forward line-rate traffic.

To configure an MPC and its corresponding Packet Forwarding Engine to use tunneling services, include the `tunnel-services` statement at the `[edit chassis fpc slot-number pic pic-number]` hierarchy level. The Junos OS creates tunnel interfaces `gr-fpc/pic/port.0`, `vt-fpc/pic/port.0`, and so on. You also configure the amount of bandwidth reserved for tunnel services.

```
[edit chassis]
fpc slot-number {
  pic number {
    tunnel-services {
      bandwidth 10g;
    }
  }
}
```



```
}
```

**fpc slot-number** is the slot number of the MPC. If two SCBs are installed, the range is 0 through 11. If three SCBs are installed, the range is 0 through 5 and 7 through 11.

**pic number** is the number of the Packet Forwarding Engine on the MPC. The range is 0 through 3.

**bandwidth 10g** is the amount of bandwidth to reserve for tunnel traffic on each Packet Forwarding Engine.

In the following example, you create tunnel interfaces on Packet Forwarding Engine 0 of MPC 4 with 10 Gbps of bandwidth reserved for tunnel traffic. With this configuration, the tunnel interfaces created are **gr-4/0/0**, **pe-4/0/0**, **pd-4/0/0**, **vt-4/0/0**, and so on.

```
[edit chassis]
fpc 4 pic 0 {
  tunnel-services {
    bandwidth 10g;
  }
}
```

#### Related Documentation

- [16-Port 10-Gigabit Ethernet MPC on MX Series Routers \(16x10GE 3D MPC\) Overview on page 6](#)
- [Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 366](#)

## Configuring Tunnel Interfaces on MX Series Routers with the MPC3E

Because the MX Series routers do not support Tunnel Services PICs, you create tunnel interfaces on MX Series routers by including the following statements at the **[edit chassis]** hierarchy level:

```
[edit chassis]
fpc slot-number {
  pic number {
    tunnel-services {
      bandwidth (1g | 10g | 20g | 40g);
    }
  }
}
```

**fpc slot-number** is the slot number of the DPC, MPC, or MIC. On the MX80 router, the range is 0 through 1. On other MX series routers, if two SCBs are installed, the range is 0 through 11. If three SCBs are installed, the range is 0 through 5 and 7 through 11.

The **pic number** On MX80 routers, if the FPC is 0, the PIC number can only be 0. If the FPC is 1, the PIC range is 0 through 3. For all other MX series routers, the range is 0 through 3.

**bandwidth (1g | 10g | 20g | 40g)** is the amount of bandwidth to reserve for tunnel traffic on each Packet Forwarding Engine.



**NOTE:** When you use MPCs and MICs, tunnel interfaces are soft interfaces and allow as much traffic as the forwarding-path allows, so it is advantageous to setup tunnel services without artificially limiting traffic by use of the **bandwidth** option. However, you *must* specify **bandwidth** when configuring tunnel services for MX Series routers with DPCs or FPCs.

**1g** indicates that 1 gigabit per second of bandwidth is reserved for tunnel traffic.

**10g** indicates that 10 gigabits per second of bandwidth is reserved for tunnel traffic.

**20g** indicates that 20 gigabits per second of bandwidth is reserved for tunnel traffic.

**40g** indicates that 40 gigabits per second of bandwidth is reserved for tunnel traffic.

If you specify a bandwidth that is not compatible, tunnel services are not activated. For example, you cannot specify a bandwidth of 1 Gbps for a Packet Forwarding Engine on a 10-Gigabit Ethernet 4-port DPC.

To verify that the tunnel interfaces have been created, issue the **show interfaces terse** operational mode command. For more information, see the [CLI Explorer](#). The bandwidth that you specify determines the port number of the tunnel interfaces that are created. When you specify a bandwidth of **1g**, the port number is always 10. When you specify any other bandwidth, the port number is always 0.

#### Related Documentation

- [Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC on page 575](#)
- [Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 576](#)
- [Example: Configuring Tunnel Interfaces on the MPC3E on page 64](#)
- [bandwidth \(Tunnel Services\) on page 606](#)
- [tunnel-services \(Chassis\) on page 817](#)
- [\[edit chassis\] Hierarchy Level](#)

---

### Example: Configuring Tunnel Interfaces on the MPC3E

- [Requirements for Configuration of Tunnel Interfaces on the MPC3E on page 64](#)
- [Ethernet Tunnel Configuration Overview on page 65](#)
- [Configuring a 20-Gigabit Ethernet Tunnel on page 65](#)
- [Configuring a Tunnel With Unspecified Bandwidth on page 65](#)

#### Requirements for Configuration of Tunnel Interfaces on the MPC3E

This example requires MX Series routers with the MPC3E.

## Ethernet Tunnel Configuration Overview

MX Series routers do not support Tunnel Services PICs. However, you can create one set of tunnel interfaces per pic slot up to a maximum of 4 slots from 0-3 on MX Series routers with the MPC3E.

To configure the tunnels, include the **tunnel-services** statement and an optional bandwidth of (1g | 10g | 20g | 30g | 40g) at the **[edit chassis]** hierarchy level.



**NOTE:** When no tunnel bandwidth is specified, the tunnel interface can have a maximum bandwidth of up to 60Gbps.



**NOTE:** A MIC need not be plugged in to the MPC3E to configure a tunnel interface.

## Configuring a 20-Gigabit Ethernet Tunnel

**Step-by-Step Procedure** In the following example, you create tunnel interfaces on PIC-slot 1 of MPC 0 with 20 gigabit per second of bandwidth reserved for tunnel traffic. With this configuration, the tunnel interfaces created are **gr-0/1/0**, **pe-0/1/0**, **pd-0/1/0**, **vt-0/1/0**, and so on.

1. To create a 20 gigabit per second tunnel interface, use the following configuration:

```
[edit chassis]
fpc 0 pic 1 {
  tunnel-services {
    bandwidth 20g;
  }
}
```

## Configuring a Tunnel With Unspecified Bandwidth

**Step-by-Step Procedure** In the following example, you create a tunnel interface on PIC-slot 3 of MPC 0 with no bandwidth specified. The tunnel traffic can carry up to a maximum of 60Gbps depending on other traffic through the packet forwarding engine. With this configuration, the tunnel interfaces created are **gr-0/3/0**, **pe-0/3/0**, **pd-0/3/0**, **vt-0/3/0**, and so on.

1. To create a tunnel interface with no bandwidth specification, use the following configuration:

```
[edit chassis]
fpc 0 pic 3 {
  tunnel-services;
}
```

- Related Documentation**
- [Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC on page 575](#)
  - [Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 576](#)
  - [bandwidth \(Tunnel Services\) on page 606](#)
  - [tunnel-services \(Chassis\) on page 817](#)
  - *Tunnel Interface Configuration on MX Series Routers Overview*

---

## Configuring Tunnel Interfaces on MX Series Routers with MPC4E

MX Series routers do not support Tunnel Services PICs. However, you can create a set of tunnel interfaces per PIC slot up to a maximum of four slots from 0 through 3 on MX Series routers with MPC4E.

To configure the tunnel interfaces, include the **tunnel-services** statement and an optional bandwidth of (**1g | 10g | 20g | 30g | 40g**) at the **[edit chassis]** hierarchy level. When no tunnel bandwidth is specified, the tunnel interface can have a maximum bandwidth of up to 60 Gbps.

To verify that the tunnel interfaces have been created, issue the **show interfaces terse** operational mode command. For more information, see the [CLI Explorer](#). The bandwidth that you specify determines the port number of the tunnel interfaces that are created. When you specify a bandwidth of **1g**, the port number is always 10. When you specify any other bandwidth, the port number is always 0.

In the following example, you create tunnel interfaces on **PIC 1** of **MPC 4** with 40 Gbps of bandwidth reserved for tunnel traffic. **fpc slot-number** is the slot number of the MPC. In this configuration, the tunnel interfaces created are gr-4/1/1, pe-4/1/1, pd-4/1/1, vt-4/1/1, and so on.

1. To create a 40-Gbps tunnel interface, use the following configuration:

```
[edit chassis]
fpc 4 pic 1 {
  tunnel-services {
    bandwidth 40g;
  }
}
```

- Related Documentation**
- [bandwidth \(Tunnel Services\) on page 606](#)
  - [tunnel-services \(Chassis\) on page 817](#)
  - *Tunnel Interface Configuration on MX Series Routers Overview*

## Configuring Tunnel Interfaces on MX Series Routers with MPC7E-MRATE/MPC7E-10G

MPCs support a total of four inline tunnels per MPC, one per PIC. You can create a set of tunnel interfaces per PIC slot up to a maximum of four slots from 0 through 3

To configure the tunnel interfaces, include the **tunnel-services** statement and an optional bandwidth of 1 Gbps through 120 Gbps at the **[edit chassis fpc fpc-slot pic number]** hierarchy level. If you do not specify the tunnel bandwidth then, the tunnel interface can have a maximum bandwidth of up to 120 Gbps.

```
[edit chassis]
fpc slot-number {
  pic number {
    tunnel-services {
      bandwidth ;
    }
  }
}
```

To verify that the tunnel interfaces have been created, issue the **show interfaces terse** operational mode command. For more information, see the [CLI Explorer](#).

In the following example, you create tunnel interfaces on PIC 1 of MPC 5 with 40 Gbps of bandwidth reserved for tunnel traffic. **fpc slot-number** is the slot number of the MPC. In this configuration, the tunnel interfaces created are gr-5/1/1, pe-5/1/1, pd-5/1/1, vt-5/1/1, and so on.

To create a 40-Gbps tunnel interface, use the following configuration:

```
[edit chassis]
fpc 5 {
  pic 1 {
    tunnel-services {
      bandwidth 40g;
    }
  }
}
```

### Related Documentation

- [Tunnel Interfaces on MX Series Routers with MPC7E-10G, MPC7E-MRATE, MX2K-MPC8E, and MX2K-MPC9E on page 41](#)
- [Configuring Tunnel Interfaces on MX Series Routers with MX2K-MPC8E on page 68](#)
- [Configuring Tunnel Interfaces on MX Series Routers with MX2K-MPC9E on page 69](#)

## Configuring Tunnel Interfaces on MX Series Routers with MX2K-MPC8E

MX2K-MPC8E support a total of four inline tunnels per MPC, one per PIC. You can create a set of tunnel interfaces per PIC slot up to a maximum of four slots from 0 through 3.

To configure the tunnel interfaces, include the **tunnel-services** statement and an optional bandwidth of 1–120Gbps at the **[edit chassis fpc fpc-slot pic number ]** hierarchy level. If you do not specify the tunnel bandwidth then, the tunnel interface can have a maximum bandwidth of up to 120 Gbps.

```
[edit chassis]
fpc slot-number {
  pic number {
    tunnel-services {
      bandwidth;
    }
  }
}
```

To verify that the tunnel interfaces have been created, issue the **show interfaces terse** operational mode command. For more information, see the [CLI Explorer](#).

In the following example, you create tunnel interfaces on PIC 1 of MPC 5 with 40 Gbps of bandwidth reserved for tunnel traffic. **fpc slot-number** is the slot number of the MPC. In this configuration, the tunnel interfaces created are gr-5/1/1, pe-5/1/1, pd-5/1/1, vt-5/1/1, and so on.

To create a 40-Gbps tunnel interface, use the following configuration:

```
[edit chassis]
fpc 5 {
  pic 1 {
    tunnel-services {
      bandwidth 40g;
    }
  }
}
```

### Related Documentation

- [Tunnel Interfaces on MX Series Routers with MPC7E-10G, MPC7E-MRATE, MX2K-MPC8E, and MX2K-MPC9E on page 41](#)
- [Configuring Tunnel Interfaces on MX Series Routers with MPC7E-MRATE/MPC7E-10G on page 67](#)
- [Configuring Tunnel Interfaces on MX Series Routers with MX2K-MPC9E on page 69](#)

## Configuring Tunnel Interfaces on MX Series Routers with MX2K-MPC9E

MX2K-MPC9E supports a total of four inline tunnels per MPC, one per PIC. You can create a set of tunnel interfaces per PIC slot up to a maximum of four slots from 0 through 3.

To configure the tunnel interfaces, include the **tunnel-services** statement and an optional bandwidth in the range 1–200Gbps at the **[edit chassis fpc *fpc-slot* pic *pic number* ]** hierarchy level. If you do not specify the tunnel bandwidth then, the tunnel interface can have a maximum bandwidth of up to 200 Gbps.

```
[edit chassis]
fpc slot-number {
  pic number {
    tunnel-services {
      bandwidth ;
    }
  }
}
```

To verify that the tunnel interfaces have been created, issue the **show interfaces terse** operational mode command. For more information, see the [CLI Explorer](#).

In the following example, you create tunnel interfaces on PIC 1 of MPC 5 with 40 Gbps of bandwidth reserved for tunnel traffic. **fpc slot-number** is the slot number of the MPC. In this configuration, the tunnel interfaces created are gr-5/1/1, pe-5/1/1, pd-5/1/1, vt-5/1/1, and so on.

To create a 40-Gbps tunnel interface, use the following configuration:

```
[edit chassis]
fpc 5 {
  pic 1 {
    tunnel-services {
      bandwidth 40g;
    }
  }
}
```

### Related Documentation

- [Tunnel Interfaces on MX Series Routers with MPC7E-10G, MPC7E-MRATE, MX2K-MPC8E, and MX2K-MPC9E on page 41](#)
- [Configuring Tunnel Interfaces on MX Series Routers with MPC7E-MRATE/MPC7E-10G on page 67](#)
- [Configuring Tunnel Interfaces on MX Series Routers with MX2K-MPC8E on page 68](#)

## Remote Port Identification using LEDs for Cabling Assistance

With new and higher-density Modular Interface Cards (MICs) and Modular Port Concentrators (MPCs), cabling is complex and can result in wiring mistakes. Remote port identification reduces the complexity by providing an easy way of identifying the ports that must be connected to the cables. Starting in Junos OS Release 16.1, the remote port identification feature is supported on MPC7E-10G, MPC7E-MRATE, MX2K-MPC8E, and MX2K-MPC9E.

Starting in Junos OS Release 18.2, the remote port identification feature is supported on JNP10K-LC2101 on MX10008 routers.

LEDs, used to display the status of the port, can be configured to blink for a small duration of time to identify the port and provide cabling assistance. Depending on the port identification required, you can configure the LED of a specific port, LEDs of all ports, LED of a specific type of port to blink. For instance, on MX2020 routers with MPC8E, you can identify the active ports that support port speeds of 100 Gbps by configuring the LEDs of the specific port to blink. Similarly, you can identify active ports that support port speeds of 10 Gbps and 40 Gbps. You can configure the LED of, for example, active port 9 on the MX2020 router with MPC9E and MIC-MRATE. You can also make the LEDs of all the ports blink, if required.

You can specify the duration of time that a LED blinks. The default duration is 5 minutes (300 seconds). You can also stop the LED from blinking before the duration expires, if required.

To enable port identification on the enhanced MPCs, you can make the LED corresponding to the ports to blink using the **request chassis port-led** command.

Release History Table

Release	Description
18.2	Starting in Junos OS Release 18.2, the remote port identification feature is supported on JNP10K-LC2101 on MX10008 routers.
16.1	Starting in Junos OS Release 16.1, the remote port identification feature is supported on MPC7E-10G, MPC7E-MRATE, MX2K-MPC8E, and MX2K-MPC9E.

Related Documentation

- [request chassis port-led on page 882](#)



## MPC and MIC Lane LED Scheme Overview

LEDs on the interface cards display the status of the ports. On some MICs and MPC that have multiple ports and supports multiple port speed, it is not feasible to have an individual LED display for each port on an interface card. Hence, a shared LED display is introduced—the lane LEDs.

The MX10003 MPC includes this new LED lane display. The Multi-Rate 12xQFSP28 MIC and the fixed-port PIC (6xQFSP) have separate lane LEDs.

The lane LEDs of the MIC are located on the MIC itself, whereas the lane LEDs of the PIC are located on the MPC.

The following interface cards support lane LEDs:

- *MX10003 MPC (Multi-Rate)*
- *MX10K-LC2101*
- *Multi-Rate Ethernet MIC*

You can select a port operating in a breakout mode for an individual lane display, either periodically or when the **request chassis port-led** command is executed. Similar to the port status LEDs, the lane LED supports 4 states defined by the color or the LED status—OFF, GREEN, AMBER, and RED.

Figure 1 on page 71 illustrates the port LED and lane LED displays on the MPC.

Figure 1: Port LED and Lane LED display on the MPC

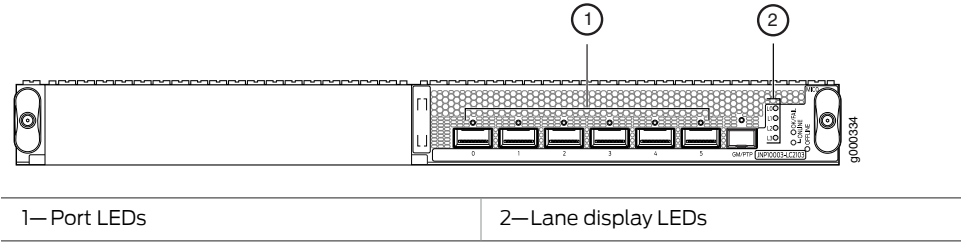


Figure 2 on page 71 illustrates the port LED and lane LED displays for the MPC.

Figure 2: Port LED and Lane LED display on the JNP10K-LC2101 MPC

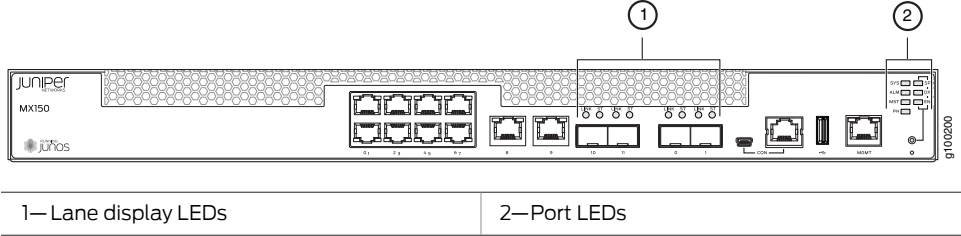
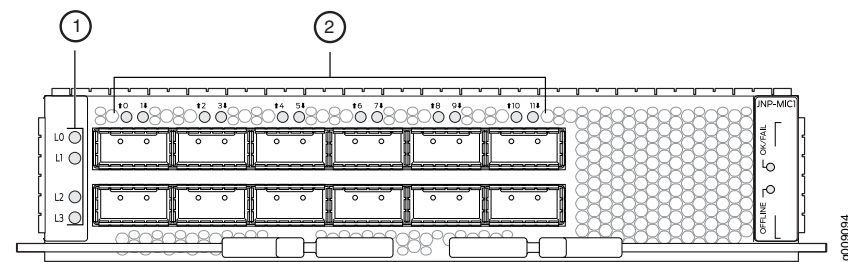


Figure 3 on page 72 illustrates the port LED and lane LED displays for the MIC.

Figure 3: Port LED and Lane LED display on the MIC



1—Lane display LEDs

2—Port LEDs

The following port LED display modes are defined:

- Normal—The port status LED represents port state or a breakout port state. By default, the port status display mode is Normal.
- Lane display—An array of lane status LEDs displays the status of each individual lane for the selected port. The lane display is ON when the software cycles through ports for lane status display. One port is selected at a time, and the display mode for that particular port switches to lane display mode. The other ports remain in normal display mode.
- Port location—The port location mode is ON when a remote operator initiates a port location command for a port or a group of ports. The **request chassis port-led** command temporarily overrides periodic software port selection for the lane display; all ports on an interface card that are not selected for port location switch to Normal mode, and selected ports switch to port location mode. If only one port is selected for port location, then the corresponding lane LEDs are applicable. However, if the selected port is in breakout mode, then all lane LEDs are applicable. If not in breakout mode, only lane 0 LED displays the port status. If more than one port is selected for port location, then the lane LEDs are disabled.

The following factors trigger a change in the port LED color:

- Change in the port state. For example, loss of signal (LOS) to no LOS, remote fault, or local fault
- Pluggable insertion or removal
- Change in configuration
- Activation or deactivation of port location feature
- Selection of breakout port for lane display



**NOTE:** Ports with all individual links in *Up* state are skipped and are not considered for lane display, thereby reducing the time needed to cycle through all the ports.

Table 16 on page 73 summarizes the state and color rules for the port LEDs. These rules help in determining the port LED color. When port location mode is activated, the port

LED state or color can be determined from the Port Location ON column. If the breakout port is selected for the lane status display, then port LED state or color can be determined from the Lane Display column.

**Table 16: Port LED State and Color Rules**

Pluggable Inserted	Breakout Configuration State	Explicitly Disabled	Port State	Normal	Port Location ON	Lane Display
Yes	No breakout	No	Up	Green	Blinking green	-
Yes	No breakout	No	Down; loss of signal (LOS) detected	Off	Blinking green	-
Yes	No breakout	No	Down; transceiver hardware failure	Red	Blinking red	-
Yes	No breakout	No	Down; any other fault other than LOS and transceiver hardware failure	Amber	Blinking amber	-
ANY	No breakout	Yes	Port disabled by CLI	Amber	Blinking amber	-
No	Any	No	Anything except disabled port; however, transceiver not present	Off	Blinking green	-
Yes	Breakout	No	All breakout ports are UP	Green	Blinking green	Blinking green
Yes	Breakout	No	All breakout ports are down with LOS	Off	Blinking green	Blinking green
Yes	Breakout	No	Hardware failure; transceiver initialization error at the port level (not individual lane)	Red	Blinking red	Blinking red
Yes	Breakout	Any	In all other cases the port LED color is amber	Amber	Blinking amber	Blinking amber

The following factors trigger a change in the lane LED color:

- A breakout port is selected for a lane display.
- Port location mode is activated for a port on a given interface card.

[Table 17 on page 73](#) summarizes the state and color rules for the lane LEDs.

**Table 17: Lane LED Color Rules**

Pluggable Inserted	Breakout Configuration State	Explicitly Disabled	Port State	Order	LED Color
Yes	Breakout	No	Up	1	Green

Table 17: Lane LED Color Rules (continued)

Pluggable Inserted	Breakout Configuration State	Explicitly Disabled	Port State	Order	LED Color
Yes	Breakout	No	Down; loss of signal (LOS) detected	2	Off
Yes	Breakout	No	Down; transceiver hardware failure	3	Red
Yes	Breakout	No	Down; fault other than LOS and transceiver hardware failure	4	Amber
Yes	Breakout	Yes	Breakout port is disabled in the CLI	5	Amber

- Related Documentation**
- [MX10003 MPC on MX10003 Router Overview on page 43](#)
  - [MX10003 MPC \(Multi-Rate\)](#)
  - [Multi-Rate Ethernet MIC](#)
  - [JNP10K-LC2101 MPC on MX10008 Routers Overview on page 44](#)
  - [MX10K-LC2101](#)
  - [request chassis port-led on page 882](#)

## MX204 LED Scheme Overview

LEDs on the interface cards display the status of the ports. In MX204 router, there are four port LEDs per port. Each port provides an individual status LED with four states signaled by the color/LED state: OFF, GREEN, AMBER, RED.

The following port LED display modes are defined:

- Normal—Represents the normal working mode of the LED. By default, the port status display mode is Normal.
- Port location—The port location mode is ON when a remote operator initiates a port location command for a port or a group of ports.

The following factors trigger a change in the port LED color:

- Change in the port state. For example, loss of signal (LOS) to no LOS, remote fault, or local fault
- Pluggable insertion or removal
- Change in configuration
- Activation or deactivation of port location feature

[Table 16 on page 73](#) summarizes the state and color rules for the port LEDs. These rules help in determining the port LED color. When port location mode is activated, the port LED state or color can be determined from the Port Location ON column.



**NOTE:** In MX204 router, there are four port LEDs per port. On PIC 0, if the port operates at the speed of 40-Gbps or 100-Gbps, then the first LED of PIC 1 will be ON and the other three LEDs will be OFF. And, if the port operates at the speed of 10-Gbps, then all the LEDs will be ON.

**Table 18: Port LED State and Color Rules**

Pluggable Inserted	Explicitly Disabled	Port State	Normal	Port Location ON
Yes	No	Up	Green	Blinking green
Yes	No	Down; loss of signal (LOS) detected	Off	Blinking green
Yes	No	Down; transceiver hardware failure	Red	Blinking red
Yes	No	Down; any other fault other than LOS and transceiver hardware failure	Amber	Blinking amber
ANY	Yes	Port disabled by CLI	Amber	Blinking amber
No	No	Anything except disabled port; however, transceiver not present	Off	Blinking green

**Related Documentation**

- [MX204 Router Overview on page 45](#)
- [MX204 Router Rate-Selectability Overview on page 210](#)
- [request chassis port-led on page 882](#)

## Guidelines for Identifying Active PICs on MPC5E (MPC5E-40G10G)

MPC5E contains two Packet Forwarding Engines (PFEs) and 4 fixed port PICs. On MPC5E-100G10G, the **PFE0** hosts **PIC0** and **PIC1** while **PFE1** hosts **PIC2** and **PIC3**. All the PICs can be powered on and used.

On the MPC5E-40G10G, the **PFE0** hosts **PIC0** and **PIC2** while **PFE1** hosts **PIC1** and **PIC3**. Only a maximum of two PICs (**PIC0** or **PIC2** and **PIC1** or **PIC3**) can be powered on. The remaining PICs are required to be kept powered off.

This topic describes the guidelines to consider while identifying active PICs on the MPC5E (MPC5E-40G10G):

- By default, (i.e. without any CLI configuration), **PIC0 (12x10GE)** and **PIC1 (12x10GE)** are powered ON while **PIC2 (3x40GE)** and **PIC3 (3x40GE)** shall be powered OFF.
- At least one PIC on every PFE should be configured in power OFF state. **PIC0** and **PIC2** belong to **PFE0** and **PIC1** and **PIC3** belong to **PFE1**.

- If you configure an invalid PIC combination, the default PICs (**PIC0** and **PIC1**) will be powered ON. Also, a syslog message is displayed to indicate the invalid PIC combination selected. When you configure an invalid PIC combination, and commit the change, the commit succeeds and a commit failure message is not displayed.

Table 19 on page 76 lists the active PICs on MPC5E-40G10G based on the configuration.

**Table 19: MPC5E-40G10G Active PICs**

CLI Configuration	PIC Selection
Default (i.e no CLI configuration)	Online: <b>PIC0</b> and <b>PIC1</b> Offline: <b>PIC2</b> and <b>PIC3</b>
<b>PIC1</b> , <b>PIC2</b> , and <b>PIC3</b> powered off	Online: <b>PIC0</b> Offline: <b>PIC1</b> , <b>PIC2</b> , and <b>PIC3</b>
<b>PIC0</b> , <b>PIC2</b> , and <b>PIC3</b> powered off	Online: <b>PIC1</b> Offline: <b>PIC0</b> , <b>PIC2</b> , and <b>PIC3</b>
<b>PIC0</b> , <b>PIC1</b> , and <b>PIC3</b> powered off	Online: <b>PIC2</b> Offline: <b>PIC0</b> , <b>PIC1</b> , and <b>PIC3</b>
<b>PIC0</b> , <b>PIC1</b> , and <b>PIC2</b> powered off	Online: <b>PIC3</b> Offline: <b>PIC0</b> , <b>PIC1</b> , and <b>PIC2</b>
<b>PIC2</b> and <b>PIC3</b> powered off	Online: <b>PIC0</b> and <b>PIC1</b> Offline: <b>PIC2</b> and <b>PIC3</b>
<b>PIC1</b> and <b>PIC2</b> powered off	Online: <b>PIC0</b> and <b>PIC3</b> Offline: <b>PIC1</b> and <b>PIC2</b>
<b>PIC0</b> and <b>PIC3</b> powered off	Online: <b>PIC1</b> and <b>PIC2</b> Offline: <b>PIC0</b> and <b>PIC3</b>
<b>PIC0</b> and <b>PIC1</b> powered off	Online: <b>PIC2</b> and <b>PIC3</b> Offline: <b>PIC0</b> and <b>PIC1</b>
Invalid PIC Configuration (All other combinations of PICs powered off)	Online: <b>PIC0</b> and <b>PIC1</b> Offline: <b>PIC2</b> and <b>PIC3</b>  <b>NOTE:</b> Default PIC configuration is selected for all invalid PIC configurations.

- Related Documentation**
- *6x40GE + 24x10GE MPC5E*
  - *6x40GE + 24x10GE MPC5EQ*
  - [MPC5E on MX Series Routers Overview on page 29](#)
  - *Protocols and Applications Supported by the MPC5E for MX Series Routers*





## CHAPTER 3

# Line Card Interoperability Overview

- Interoperability of Type 3 FPCs and Type 4 FPCs with Type 5 FPCs on page 79
- Interoperability Between MPC4E (MPC4E-3D-2CGE-8XGE) and 100-Gigabit Ethernet PICs on Type 4 FPC on page 80
- Configuring 100-Gigabit Ethernet MICs to Interoperate with Type 4 100-Gigabit Ethernet PICs (PD-1CE-CFP-FPC4) Using SA Multicast Mode on page 80
- Configuring MPC4E (MPC4E-3D-2CGE-8XGE) to Interoperate with 100-Gigabit Ethernet PICs on Type 4 FPC Using SA Multicast Mode on page 83
- Interoperability Between MPC7E-MRATE and 100-Gigabit Ethernet PICs on Type 4 FPC on page 85
- Configuring MPC7E-MRATE to Interoperate with 100-Gigabit Ethernet PICs on Type 4 FPC Using SA Multicast Mode on page 86
- Interoperability Between MPC8E (MX2K-MPC8E) and 100-Gigabit Ethernet PICs on Type 4 FPC on page 88
- Configuring MPC8E to Interoperate with 100-Gigabit Ethernet PICs on Type 4 FPC Using SA Multicast Mode on page 89
- Interoperability Between MPC9E (MX2K-MPC9E) and 100-Gigabit Ethernet PICs on Type 4 FPC on page 91
- Configuring MPC9E to Interoperate with 100-Gigabit Ethernet PICs on Type 4 FPC Using SA Multicast Mode on page 92

### Interoperability of Type 3 FPCs and Type 4 FPCs with Type 5 FPCs

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Support for interoperability of Type 3 FPCs, Type 4 FPCs, and T640-FPC4-1P-ES with Type 5 FPCs is now possible with fabric notification translation. This feature is supported on T4000 routers.

Basic packet forwarding, IPv4, IPv6, MPLS, and multicast (dataplane) are currently supported through this feature.

- Related Documentation**
- *T4000 FPCs Supported*
  - *T4000 PICs Supported*

## Interoperability Between MPC4E (MPC4E-3D-2CGE-8XGE) and 100-Gigabit Ethernet PICs on Type 4 FPC

---

You can enable interoperability between the MPC4E (MPC4E-3D-2CGE-8XGE) and the 100-Gigabit Ethernet PIC (PD-ICE-CFP-FPC4) by:

- Enabling source address (SA) multicast bit steering mode on the MPC4E.
- Configuring the two 50-Gigabit Ethernet physical interfaces on the 100-Gigabit Ethernet PIC PD-ICE-CFP-FPC4 as one aggregated Ethernet physical interface.

SA multicast mode uses the multicast bit in the source MAC address for packet steering. By default, the SA multicast bit is set to 0 for all packets sent by the MPC4E. The egress packet flow is the traffic flowing from the MPC4E to the 100-Gigabit Ethernet PIC. Because no VLAN tags are available, the SA multicast bit is sent on the outgoing packets. At the other end, the 100-Gigabit Ethernet PIC checks the multicast bit and forwards the packets to either Packet Forwarding Engine 0 or Packet Forwarding Engine 1. The ingress packet flow is the traffic flowing from the 100-Gigabit Ethernet PIC to the MPC4E. When the 100-Gigabit Ethernet PIC sends out a packet, the multicast bit is set based on the packet received from the Packet Forwarding Engine. The multicast bit is then transmitted and the MPC4E checks the multicast bit on ingress.

The 100-Gigabit Ethernet PIC uses a Type 4 FPC and two 50-Gbps Packet Forwarding Engines to achieve a throughput of 100 Gbps. The 50-Gbps physical interfaces are created when the 100-Gigabit Ethernet PIC is plugged in. The two physical interfaces are visible and configuration is allowed on both physical interfaces. The physical interfaces on the 100-Gigabit Ethernet PIC must be configured in static LAG mode without enabling Link Aggregation Control Protocol (LACP). This ensures that a single 100-Gigabit Ethernet aggregated interface is visible on the link connecting to the MPC4E instead of two independent 50-Gbps interfaces.

### Related Documentation

- *forwarding-mode*
- *sa-multicast*
- [Configuring MPC4E \(MPC4E-3D-2CGE-8XGE\) to Interoperate with 100-Gigabit Ethernet PICs on Type 4 FPC Using SA Multicast Mode on page 83](#)

## Configuring 100-Gigabit Ethernet MICs to Interoperate with Type 4 100-Gigabit Ethernet PICs (PD-ICE-CFP-FPC4) Using SA Multicast Mode

---

To configure a 100-Gigabit Ethernet MIC (MIC3-3D-1X100GE-CFP) to interoperate with Juniper Networks Type 4 100-Gigabit Ethernet PICs (model number PD-ICE-CFP-FPC4), you can use the **forwarding-mode** statement with the **sa-multicast** option at the **[edit chassis fpc slot pic slot]** hierarchy level.

SA multicast mode uses the multicast bit in the source MAC address for packet steering. By default, the SA multicast bit is set to 0 for all packets sent by the 100-Gigabit Ethernet MIC. The egress packet flow is the traffic flowing from the 100-Gigabit Ethernet MIC to the 100-Gigabit Ethernet PIC. Since no VLAN tags are available, the SA multicast bit is

sent on the outgoing packets. At the other end, the 100-Gigabit Ethernet PIC looks at the bit and forwards the packets to either Packet Forwarding Engine 0 or 1. The ingress packet flow is the traffic flowing from a 100-Gigabit Ethernet PIC to a 100-Gigabit Ethernet MIC. When the 100-Gigabit Ethernet PIC is sending out a packet, the multicast bit is set based on the Packet Forwarding Engine packet received. The multicast bit is then transmitted and the MPC3E sees the multicast bit on ingress.



**NOTE:** The SA multicast bit is ignored by MPC3E while learning the source MAC addresses.

### Configuring 100-Gigabit Ethernet MICs

The interoperability mode between the 100-Gigabit Ethernet MIC and the 100-Gigabit Ethernet PIC is configured on a PIC basis. The MPC3E has two MIC slots. A 100-Gigabit Ethernet MIC installed in slot 0 corresponds to **pic 0**, and the MIC installed in slot 1 corresponds to **pic 2**.



**NOTE:** The configuration is valid only on PIC 0 and PIC 2.

To configure SA multicast mode on a Juniper Networks 100-Gigabit Ethernet MIC in MPC 0, PIC 0 for interconnection with another Juniper Networks 100-Gigabit Ethernet PIC, use the **set chassis fpc slot pic slot forwarding-mode sa-multicast** command, as follows:

```
[edit chassis fpc slot pic slot]
forwarding-mode {
  sa-multicast;
}
```

You can use the **show forwarding-mode** command to view the resulting configuration, as follows:

```
[edit chassis fpc slot pic slot]
user@host# show forwarding-mode
```

### Configuring 100-Gigabit Ethernet PIC (PD-ICE-CFP-FPC4)

The default packet steering mode for the 100-Gigabit Ethernet PIC (PD-ICE-CFP-FPC4) is SA multicast bit mode. There is no SA multicast configuration required on the 100-Gigabit Ethernet PIC to enable this mode.



**NOTE:** SA multicast mode can be configured, but it is not necessary.

The 100-Gigabit Ethernet PIC uses a Type 4 FPC and two 50 Gbps Packet Forwarding Engines to achieve 100 Gbps throughput. The 50 Gbps physical interfaces are created when the 100-Gigabit Ethernet PIC is installed. The two physical interfaces are visible and configuration is allowed on both physical interfaces. The physical interfaces on the 100-Gigabit Ethernet PIC should be configured in static LAG mode without enabling Link Aggregation Control Protocol (LACP). This ensures that a single 100-Gigabit aggregated interface is visible on the link connecting to the 100-Gigabit Ethernet MIC instead of two independent 50 Gbps interfaces.

When the PIC is in aggregated Ethernet mode, the two physical interfaces on the same PIC are aggregated into one AE physical interface. When the PIC is configured with two physical interfaces, it creates the physical interfaces **et-fpc/pic/0:0** and **et-fpc/pic/0:1** where *fpc* is the FPC slot number and *pic* is the PIC slot number. The example shows how to configure two physical interfaces for PIC 0 in FPC 5:

```
chassis {
  aggregated-devices {
    ethernet {
      device-count 1;
    }
  }
  interfaces {
    et-5/0/0:0 {
      gigether-options {
        802.3ad ae0;
      }
    }
    et-5/0/0:1 {
      gigether-options {
        802.3ad ae0;
      }
    }
  }
}
```

### Related Documentation

- *forwarding-mode (100-Gigabit Ethernet)*
- *sa-multicast (100-Gigabit Ethernet)*

## Configuring MPC4E (MPC4E-3D-2CGE-8XGE) to Interoperate with 100-Gigabit Ethernet PICs on Type 4 FPC Using SA Multicast Mode

You can enable interoperability between the MPC4E and the 100-Gigabit Ethernet PIC by performing the following tasks:

- [Configuring SA Multicast Bit Steering Mode on MPC4E on page 83](#)
- [Configuring Two 50-Gigabit Ethernet Physical Interfaces on the Ethernet PIC as One Aggregated Ethernet Interface on page 84](#)

### Configuring SA Multicast Bit Steering Mode on MPC4E

The interoperability mode between the MPC4E and the 100-Gigabit Ethernet PIC is configured on a PIC basis. MPC4E-3D-2CGE-8XGE is a fixed-configuration MPC and does not contain separate slots for Modular Interfaces Cards (MICs). MPC4E contains two Packet Forwarding Engines—PFE 0 hosts PIC 0 and PIC 1 and PFE 1 hosts PIC 2 and PIC 3.



**NOTE:** This configuration is valid only on PIC 1 and PIC 3.

To configure SA multicast mode on PIC 1 of an MX480 router with MPC4E for interconnection with the 100-Gigabit Ethernet PIC:

1. To specify the forwarding mode as **sa-multicast**, include the **forwarding-mode** statement at the `[edit chassis fpc slot pic slot]` hierarchy level.

```
[edit chassis]
user@host # set fpc 3 pic 1 forwarding-mode sa-multicast
```

2. To verify that the forwarding mode is set to **sa-multicast**, issue the following command:

```
[edit chassis fpc 3 pic 1]
user@host # show forwarding-mode
```

- See Also**
- *sa-multicast*
  - [Interoperability Between MPC4E \(MPC4E-3D-2CGE-8XGE\) and 100-Gigabit Ethernet PICs on Type 4 FPC on page 80](#)

## Configuring Two 50-Gigabit Ethernet Physical Interfaces on the Ethernet PIC as One Aggregated Ethernet Interface

When the PIC is in aggregated Ethernet mode, the two physical interfaces on the same PIC are aggregated into one aggregated Ethernet physical interface. When the PIC is configured with two physical interfaces, it creates the physical interfaces `et-x/y/0:0` and `et-x/y/0:1` where `x` is the FPC slot number and `y` is the PIC slot number.

The default packet steering mode for the 100-Gigabit Ethernet PIC is SA multicast bit mode. No SA multicast configuration is required on the 100-Gigabit Ethernet PIC to enable this mode.



**NOTE:** SA multicast mode can be configured, but it is not necessary.

1. To specify the number of aggregated Ethernet interfaces to be created:

```
[edit chassis aggregated-devices ethernet]
user@host # set device-count 2
```

2. To specify the members to be included within the aggregated Ethernet bundle:

```
[edit interfaces]
user@host # set et-4/3/0:0 gigether-options 802.3ad ae0
user@host # set et-4/3/0:1 gigether-options 802.3ad ae0
```

3. Verify the configuration at the interface.

```
[edit]
user@host # show interfaces
```

```
..
et-4/3/0:0 {
  gigether-options {
    802.3ad ae0;
  }
}
et-4/3/0:1 {
  gigether-options {
    802.3ad ae0;
  }
}
```

**See Also** • [\*forwarding-mode\*](#)

- [Interoperability Between MPC4E \(MPC4E-3D-2CGE-8XGE\) and 100-Gigabit Ethernet PICs on Type 4 FPC on page 80](#)

- Related Documentation**
- *sa-multicast*
  - *forwarding-mode*
  - [Interoperability Between MPC4E \(MPC4E-3D-2CGE-8XGE\) and 100-Gigabit Ethernet PICs on Type 4 FPC on page 80](#)

## Interoperability Between MPC7E-MRATE and 100-Gigabit Ethernet PICs on Type 4 FPC

You can enable interoperability between the MPC7E (MPC7E-MRATE) and the 100-Gigabit Ethernet PIC (PD-1CE-CFP-FPC4) by:

- Enabling source address (SA) multicast bit steering mode on the MPC7E
- Configuring the two 50-Gigabit Ethernet physical interfaces on the 100-Gigabit Ethernet PIC PD-1CE-CFP-FPC4 as one aggregated Ethernet physical interface.

SA multicast mode uses the multicast bit in the source MAC address for packet steering. By default, the SA multicast bit is set to 0 for all packets sent by the MPC7E. The egress packet flow is the traffic flowing from the MPC to the 100-Gigabit Ethernet interface. Because no VLAN tags are available, the SA multicast bit is sent on the outgoing packets. At the other end, the 100-Gigabit Ethernet interface checks the multicast bit and forwards the packets to either Packet Forwarding Engine 0 or Packet Forwarding Engine 1. The ingress packet flow is the traffic flowing from the 100-Gigabit Ethernet interface to the MPC7E. When the 100-Gigabit Ethernet interface sends out a packet, the multicast bit is set based on the packet received from the Packet Forwarding Engine. The multicast bit is then transmitted and the MPC7E checks the multicast bit on ingress.

The 100-Gigabit Ethernet PIC uses a Type 4 FPC and two 50-Gbps Packet Forwarding Engines to achieve a throughput of 100 Gbps. The 50-Gbps physical interfaces are created when the 100-Gigabit Ethernet PIC is plugged in. The two physical interfaces are visible and configuration is allowed on both physical interfaces. The physical interfaces on the 100-Gigabit Ethernet PIC must be configured in static LAG mode without enabling Link Aggregation Control Protocol (LACP). This ensures that a single 100-Gigabit Ethernet aggregated interface is visible on the link connecting to the MPC7E instead of two independent 50-Gbps interfaces.

- Related Documentation**
- *forwarding-mode*
  - *sa-multicast*
  - [Configuring MPC7E-MRATE to Interoperate with 100-Gigabit Ethernet PICs on Type 4 FPC Using SA Multicast Mode on page 86](#)

## Configuring MPC7E-MRATE to Interoperate with 100-Gigabit Ethernet PICs on Type 4 FPC Using SA Multicast Mode

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You can enable interoperability between the MPC7E (MPC7E-MRATE) and the 100-Gigabit Ethernet PIC by performing the following tasks:

- [Configuring SA Multicast Bit Steering Mode on MPC7E on page 86](#)
- [Configuring Two 50-Gigabit Ethernet Physical Interfaces on the Ethernet PIC as One Aggregated Ethernet Interface on page 87](#)

### Configuring SA Multicast Bit Steering Mode on MPC7E

The interoperability mode between the MPC7E (MPC7E-MRATE) and the 100-Gigabit Ethernet PIC is configured on a PIC basis. MPC7E is a fixed-configuration MPC and does not contain separate slots for Modular Interfaces Cards (MICs). MPC7E contains two Packet Forwarding Engines—PFE 0 hosts PIC 0 and PFE 1 hosts PIC 1.

To configure SA multicast mode on FPC13, PIC 1 of MPC7E-MRATE for interconnection with the 100-Gigabit Ethernet PIC:

1. To specify the forwarding mode as **sa-multicast**, include the **forwarding-mode** statement at the **[edit chassis fpc slot pic slot]** hierarchy level.

```
[edit chassis]
user@host # set fpc 13 pic 1 forwarding-mode sa-multicast
```

2. To verify that the forwarding mode is set to **sa-multicast**, issue the following command:

```
[edit chassis fpc 13 pic 1]
user@host # show forwarding-mode
```

**See Also** • *sa-multicast*

- [Interoperability Between MPC7E-MRATE and 100-Gigabit Ethernet PICs on Type 4 FPC on page 85](#)



## Configuring Two 50-Gigabit Ethernet Physical Interfaces on the Ethernet PIC as One Aggregated Ethernet Interface

When the PIC is in aggregated Ethernet mode, the two physical interfaces on the same PIC are aggregated into one aggregated Ethernet physical interface. When the PIC is configured with two physical interfaces, it creates the physical interfaces `et-x/y/0:0` and `et-x/y/0:1` where `x` is the FPC slot number and `y` is the PIC slot number.

The default packet steering mode for the 100-Gigabit Ethernet PIC is SA multicast bit mode. No SA multicast configuration is required on the 100-Gigabit Ethernet PIC to enable this mode.



**NOTE:** SA multicast mode can be configured, but it is not necessary.

1. To specify the number of aggregated Ethernet interfaces to be created:

```
[edit chassis aggregated-devices ethernet]
user@host # set device-count 2
```

2. To specify the members to be included within the aggregated Ethernet bundle:

```
[edit interfaces]
user@host # set et-4/3/0:0 gigether-options 802.3ad ae0
user@host # set et-4/3/0:1 gigether-options 802.3ad ae0
```

3. Verify the configuration at the interface.

```
[edit]
user@host # show interfaces
```

```
..
et-4/3/0:0 {
  gigether-options {
    802.3ad ae0;
  }
}
et-4/3/0:1 {
  gigether-options {
    802.3ad ae0;
  }
}
```

- See Also**
- *forwarding-mode*
  - [Interoperability Between MPC7E-MRATE and 100-Gigabit Ethernet PICs on Type 4 FPC on page 85](#)

- Related Documentation**
- *sa-multicast*
  - *forwarding-mode*
  - [Interoperability Between MPC7E-MRATE and 100-Gigabit Ethernet PICs on Type 4 FPC on page 85](#)

---

## Interoperability Between MPC8E (MX2K-MPC8E) and 100-Gigabit Ethernet PICs on Type 4 FPC

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You can enable interoperability between the MPC8E (MX2K-MPC8E) and the 100-Gigabit Ethernet PIC (PD-1CE-CFP-FPC4) by:

- Enabling source address (SA) multicast bit steering mode on the MPC8E.
- Configuring the two 50-Gigabit Ethernet physical interfaces on the 100-Gigabit Ethernet PIC PD-1CE-CFP-FPC4 as one aggregated Ethernet physical interface.

SA multicast mode uses the multicast bit in the source MAC address for packet steering. By default, the SA multicast bit is set to 0 for all packets sent by the MPC8E. The egress packet flow is the traffic flowing from the MPC to the 100-Gigabit Ethernet Interface. Because no VLAN tags are available, the SA multicast bit is sent on the outgoing packets. At the other end, the 100-Gigabit Ethernet Interface checks the multicast bit and forwards the packets to either Packet Forwarding Engine 0 or Packet Forwarding Engine 1. The ingress packet flow is the traffic flowing from the 100-Gigabit Ethernet Interface to the MPC8E. When the 100-Gigabit Ethernet Interface sends out a packet, the multicast bit is set based on the packet received from the Packet Forwarding Engine. The multicast bit is then transmitted and the MPC8E checks the multicast bit on ingress.

The 100-Gigabit Ethernet PIC uses a Type 4 FPC and two 50-Gbps Packet Forwarding Engines to achieve a throughput of 100 Gbps. The 50-Gbps physical interfaces are created when the 100-Gigabit Ethernet PIC is plugged in. The two physical interfaces are visible and configuration is allowed on both physical interfaces. The physical interfaces on the 100-Gigabit Ethernet PIC must be configured in static LAG mode without enabling Link Aggregation Control Protocol (LACP). This ensures that a single 100-Gigabit Ethernet aggregated interface is visible on the link connecting to the MPC8E instead of two independent 50-Gbps interfaces.

- Related Documentation**
- *forwarding-mode*
  - *sa-multicast*
  - [Configuring MPC8E to Interoperate with 100-Gigabit Ethernet PICs on Type 4 FPC Using SA Multicast Mode on page 89](#)

## Configuring MPC8E to Interoperate with 100-Gigabit Ethernet PICs on Type 4 FPC Using SA Multicast Mode

You can enable interoperability between the MPC8E (MX2K-MPC8E) and the 100-Gigabit Ethernet PIC by performing the following tasks:

- [Configuring SA Multicast Bit Steering Mode on MPC8E on page 89](#)
- [Configuring Two 50-Gigabit Ethernet Physical Interfaces on the Ethernet PIC as One Aggregated Ethernet Interface on page 90](#)

### Configuring SA Multicast Bit Steering Mode on MPC8E

The interoperability mode between the MPC8E and the 100-Gigabit Ethernet PIC is configured on a PIC basis. MPC8E (MX2K-MPC8E) is a modular MPC that contains two slots for Modular Interfaces Cards (MICs). MPC8E contains four Packet Forwarding Engines—PIC 0 hosts PFE 0 and PFE 1. PIC 1 hosts PFE 2 and PFE 3.

To configure SA multicast mode on FPC 7, PIC 1 of MPC8E for interconnection with the 100-Gigabit Ethernet PIC:

1. To specify the forwarding mode as **sa-multicast**, include the **forwarding-mode** statement at the **[edit chassis fpc slot pic slot]** hierarchy level.

```
[edit chassis]
user@host # set fpc 7 pic 1 forwarding-mode sa-multicast
```

2. To verify that the forwarding mode is set to **sa-multicast**, issue the following command:

```
[edit chassis]
user@host # show fpc 7 pic 1 forwarding-mode
```

```
sa-multicast;
```

**See Also** • *sa-multicast*

- [Interoperability Between MPC8E \(MX2K-MPC8E\) and 100-Gigabit Ethernet PICs on Type 4 FPC on page 88](#)

## Configuring Two 50-Gigabit Ethernet Physical Interfaces on the Ethernet PIC as One Aggregated Ethernet Interface

When the PIC is in aggregated Ethernet mode, the two physical interfaces on the same PIC are aggregated into one aggregated Ethernet physical interface. When the PIC is configured with two physical interfaces, it creates the physical interfaces `et-x/y/0:0` and `et-x/y/0:1` where `x` is the FPC slot number and `y` is the PIC slot number.

The default packet steering mode for the 100-Gigabit Ethernet PIC is SA multicast bit mode. No SA multicast configuration is required on the 100-Gigabit Ethernet PIC to enable this mode.



**NOTE:** SA multicast mode can be configured, but it is not necessary.

1. To specify the number of aggregated Ethernet interfaces to be created:

```
[edit chassis aggregated-devices ethernet]
user@host # set device-count 2
```

2. To specify the members to be included within the aggregated Ethernet bundle:

```
[edit interfaces]
user@host # set et-4/3/0:0 gigether-options 802.3ad ae0
user@host # set et-4/3/0:1 gigether-options 802.3ad ae0
```

3. Verify the configuration at the interface.

```
[edit]
user@host # show interfaces
```

```
..
et-4/3/0:0 {
  gigether-options {
    802.3ad ae0;
  }
}
et-4/3/0:1 {
  gigether-options {
    802.3ad ae0;
  }
}
```

- See Also**
- [forwarding-mode](#)
  - [Interoperability Between MPC8E \(MX2K-MPC8E\) and 100-Gigabit Ethernet PICs on Type 4 FPC on page 88](#)

- Related Documentation**
- *sa-multicast*
  - *forwarding-mode*
  - [Interoperability Between MPC8E \(MX2K-MPC8E\) and 100-Gigabit Ethernet PICs on Type 4 FPC on page 88](#)

## Interoperability Between MPC9E (MX2K-MPC9E) and 100-Gigabit Ethernet PICs on Type 4 FPC

You can enable interoperability between the MPC9E (MX2K-MPC9E) and the 100-Gigabit Ethernet PIC (PD-ICE-CFP-FPC4) by:

- Enabling source address (SA) multicast bit steering mode on the MPC9E.
- Configuring the two 50-Gigabit Ethernet physical interfaces on the 100-Gigabit Ethernet PIC PD-ICE-CFP-FPC4 as one aggregated Ethernet physical interface.

SA multicast mode uses the multicast bit in the source MAC address for packet steering. By default, the SA multicast bit is set to 0 for all packets sent by the MPC9E. The egress packet flow is the traffic flowing from the MPC9E to the 100-Gigabit Ethernet Interface. Because no VLAN tags are available, the SA multicast bit is sent on the outgoing packets. At the other end, the 100-Gigabit Ethernet Interface checks the multicast bit and forwards the packets to either Packet Forwarding Engine 0 or Packet Forwarding Engine 1. The ingress packet flow is the traffic flowing from the 100-Gigabit Ethernet Interface to the MPC9E. When the 100-Gigabit Ethernet interface sends out a packet, the multicast bit is set based on the packet received from the Packet Forwarding Engine. The multicast bit is then transmitted and the MPC9E checks the multicast bit on ingress.

The 100-Gigabit Ethernet PIC uses a Type 4 FPC and two 50-Gbps Packet Forwarding Engines to achieve a throughput of 100 Gbps. The 50-Gbps physical interfaces are created when the 100-Gigabit Ethernet PIC is plugged in. The two physical interfaces are visible and configuration is allowed on both physical interfaces. The physical interfaces on the 100-Gigabit Ethernet PIC must be configured in static LAG mode without enabling Link Aggregation Control Protocol (LACP). This ensures that a single 100-Gigabit Ethernet aggregated interface is visible on the link connecting to the MPC9E instead of two independent 50-Gbps interfaces.

- Related Documentation**
- *forwarding-mode*
  - *sa-multicast*
  - [Configuring MPC9E to Interoperate with 100-Gigabit Ethernet PICs on Type 4 FPC Using SA Multicast Mode on page 92](#)

## Configuring MPC9E to Interoperate with 100-Gigabit Ethernet PICs on Type 4 FPC Using SA Multicast Mode

---

You can enable interoperability between the MPC9E (MX2K-MPC9E) and the 100-Gigabit Ethernet PIC by performing the following tasks:

- [Configuring SA Multicast Bit Steering Mode on MPC9E on page 92](#)
- [Configuring Two 50-Gigabit Ethernet Physical Interfaces on the Ethernet PIC as One Aggregated Ethernet Interface on page 93](#)

### Configuring SA Multicast Bit Steering Mode on MPC9E

The interoperability mode between the MPC9E and the 100-Gigabit Ethernet PIC is configured on a PIC basis. MPC9E (MX2K-MPC9E) is a modular MPC that contains two slots for Modular Interfaces Cards (MICs). MPC9E contains four Packet Forwarding Engines—PIC 0 hosts PFE 0 and PFE 1. PIC 1 hosts PFE 2 and PFE 3.

To configure SA multicast mode on **FPC 19, PIC 1** of MPC9E for interconnection with the 100-Gigabit Ethernet PIC:

1. To specify the forwarding mode as **sa-multicast**, include the **forwarding-mode** statement at the **[edit chassis fpc slot pic slot]** hierarchy level.

```
[edit chassis]
user@host # set fpc 19 pic 1 forwarding-mode sa-multicast
```

2. To verify that the forwarding mode is set to **sa-multicast**, issue the following command:

```
[edit chassis]
user@host # show fpc 19 pic 1 forwarding-mode
```

```
sa-multicast;
```

**See Also** • [\*sa-multicast\*](#)

- [Interoperability Between MPC9E \(MX2K-MPC9E\) and 100-Gigabit Ethernet PICs on Type 4 FPC on page 91](#)

## Configuring Two 50-Gigabit Ethernet Physical Interfaces on the Ethernet PIC as One Aggregated Ethernet Interface

When the PIC is in aggregated Ethernet mode, the two physical interfaces on the same PIC are aggregated into one aggregated Ethernet physical interface. When the PIC is configured with two physical interfaces, it creates the physical interfaces et-x/y/0:0 and et-x/y/0:1 where x is the FPC slot number and y is the PIC slot number.

The default packet steering mode for the 100-Gigabit Ethernet PIC is SA multicast bit mode. No SA multicast configuration is required on the 100-Gigabit Ethernet PIC to enable this mode.



**NOTE:** SA multicast mode can be configured, but it is not necessary.

1. To specify the number of aggregated Ethernet interfaces to be created:

```
[edit chassis aggregated-devices ethernet]
user@host # set device-count 2
```

2. To specify the members to be included within the aggregated Ethernet bundle:

```
[edit interfaces]
user@host # set et-4/3/0:0 gigether-options 802.3ad ae0
user@host # set et-4/3/0:1 gigether-options 802.3ad ae0
```

3. Verify the configuration at the interface.

```
[edit]
user@host # show interfaces
```

```
..
et-4/3/0:0 {
  gigether-options {
    802.3ad ae0;
  }
}
et-4/3/0:1 {
  gigether-options {
    802.3ad ae0;
  }
}
```

- See Also**
- *forwarding-mode*
  - [Interoperability Between MPC9E \(MX2K-MPC9E\) and 100-Gigabit Ethernet PICs on Type 4 FPC on page 91](#)

**Related  
Documentation**

- *sa-multicast*
- *forwarding-mode*
- [Interoperability Between MPC9E \(MX2K-MPC9E\) and 100-Gigabit Ethernet PICs on Type 4 FPC on page 91](#)



## CHAPTER 4

# Configuring Power Management

- [T4000 Power Management Overview on page 95](#)
- [Understanding Power Management on the PTX5000 on page 98](#)
- [Managing Power Allocated to PTX5000 FPCs on the Basis of Chassis Ambient Temperature Configuration on page 101](#)
- [Understanding How Dynamic Power Management Enables Better Utilization of Power on page 103](#)
- [Understanding How Configuring Ambient Temperature Helps Optimize Power Utilization on page 104](#)
- [Monitoring the Power Consumption of PTX5000 FPCs by Configuring the Ambient Temperature on page 105](#)
- [Redistributing the Available Power by Configuring Power-On Sequence on page 108](#)
- [Configuring Power-On Sequence to Redistribute the Available Power on page 109](#)
- [Configuring the Six-Input DC Power Supply on T Series Routers on page 110](#)

## T4000 Power Management Overview

---

Starting with Junos OS Release 12.3, the power management feature is enabled on a Juniper Networks T4000 Core Router. This feature enables you to limit the overall chassis output power consumption. That is, this feature enables you to limit the router from powering on a Flexible PIC Concentrator (FPC) when sufficient output power is not available to power on the FPC during booting or normal operation.

The power management feature is enabled only when six input feeds with 40 amperes (A) each or four input feeds with 60 A each is configured on the router. The power management feature is *not* enabled for any other input feed—current combination. When the power management feature is *not* enabled, Junos OS tries to power on all the FPCs connected to the router.



**CAUTION:** : If you do not configure the power management feature and the maximum power draw is exceeded by the router during booting or normal operation, FPCs' states might change from Online to Offline or Present, some traffic might drop, or the interfaces might flap.



**TIP:** Interface flapping occurs when a router alternately announces the state of the interface to be as *up* and *down* in quick sequence.

After you connect the input feeds to the router, you must configure the number of input feeds connected to the router and the amount of current received at the input feeds. Use the **feeds** statement and the **input current** statement at the **[edit chassis pem]** hierarchy level to configure the number of input feeds and the amount of current received at each input feeds, respectively.



**NOTE:** You can connect three 80 A DC power cables to the six-input DC power supply by using terminal jumpers. When you do this, ensure that you configure the **feeds** statement to have the value 6 and the **input current** statement to have the value 40. If these configurations are not set, the power management feature is *not* enabled and, therefore, Junos OS tries to power on all the FPCs connected to the router.

When the power management feature is enabled, FPCs connected to the router are powered on based on the power received by the router. If the router receives sufficient power to power on all the FPCs connected to the router, all the FPCs are powered on. If sufficient power is not available, Junos OS limits the number of FPCs brought online. That is, Junos OS uses the total available chassis output power as a factor to decide whether or not to power on an FPC connected to the router.

Of all the supported FPCs of a T4000 router, the T1600 Enhanced Scaling FPC4 (model number: T1600-FPC4-ES) has the greatest power requirement. [Table 20 on page 96](#) compares the FPC connection limits between a six-input feed 40 A connection and a four-input feed 60 A connection when power management is enabled and T1600-FPC4-ES is connected to router.

**Table 20: FPC Connection Limit Comparison**

Six Input Feeds with 40 A Connection	Four Input Feeds with 60 A Connection
When T1600-FPC4-ES is <i>not</i> connected: <ul style="list-style-type: none"> <li>All eight FPC slots can be brought online.</li> </ul>	When T1600-FPC4-ES is <i>not</i> connected: <ul style="list-style-type: none"> <li>A maximum of seven other FPCs can be brought online. That is, only seven slots out of the eight FPC slots can be brought online.</li> </ul>
When only one T1600-FPC4-ES is connected: <ul style="list-style-type: none"> <li>A maximum of seven other FPCs can be brought online. That is, only seven slots out of the eight FPC slots can be brought online.</li> </ul>	When only one T1600-FPC4-ES is connected: <ul style="list-style-type: none"> <li>A maximum of six other FPCs can be brought online. That is, only six slots out of the eight FPC slots can be brought online.</li> </ul>
When only T1600-FPC4-ES FPCs are connected: <ul style="list-style-type: none"> <li>A maximum of six T1600-FPC4-ES FPCs can be brought online.</li> </ul>	More than one T1600-FPC4-ES <i>cannot</i> be brought online.

**NOTE:**

- When the power management feature is enabled, FPC power-on consistency is not maintained across router reboots. That is, the same set of FPCs that were powered on before a reboot might not be powered on after the reboot. Before the router reboot, the FPCs are powered on according to their insertion order in the chassis. After the reboot, the FPCs are powered on according to the FRU power-on sequence configured in the `fru-poweron-sequence` statement at the `[edit chassis]` hierarchy level. If the FRU power-on sequence is not configured, Junos OS uses the ascending order of the slot numbers of the FPCs as the sequence to power on the FPCs.
- Removal of any online FPC from the chassis does not change the state of any other FPC and does not trigger the power management feature to power on the FPCs that were not powered on initially because of the lack of sufficient power. When any online FPC is removed from the chassis, if you need to trigger the power management feature to re-evaluate the situation, you need to reboot or restart the chassis. Alternatively, you can make a configuration change at the `[edit chassis]` hierarchy level and then issue the `commit` command to commit the changes made at the `[edit chassis]` hierarchy level. The power management feature re-evaluates the situation when a configuration change is committed at the `[edit chassis]` hierarchy level.

**Related Documentation**

- [Configuring the Six-Input DC Power Supply on T Series Routers on page 110](#)
- [Configuring Power-On Sequence to Redistribute the Available Power on page 109](#)
- [pem on page 731](#)
- [feeds on page 649](#)
- [input-current on page 681](#)
- [fru-poweron-sequence on page 669](#)

## Understanding Power Management on the PTX5000

---

Starting in Junos OS Release 14.1, the power management feature for PTX5000 routers ensures that at any time, the chassis power requirements do not exceed the available chassis power. The PTX5000 has two PDUs to meet the power requirements of the chassis. Each PDU is capable of providing power to the chassis on its own. In case the power requirement exceeds the individual capacity of a PDU, the required power is provided by both the PDUs and the **No redundant power supply** alarm is triggered. If the system cannot provide power for all the installed FPCs or PICs, the system brings down FPCs or PICs that in can no longer provide power for and the **Insufficient Power - FRU(s) went offline** alarm is raised.

The power management feature provides the following functionality:

- Power management ensures that high-priority FPCs continue to receive power when the system does not have sufficient power to keep all the FPCs online.
- Power management ensures that if a power supply fails, the router can continue to operate normally by keeping high-priority FPCs online and taking low-priority FPCs offline.
- If power supply failure requires power management to power down some components, power management does so by gracefully powering down lower-priority FPCs.

Power management manages power to router components by employing a power budget policy. In its power budget policy, power management:

- Budgets power for each installed router component that requires power. The amount that power management budgets for each component is the maximum power that component might consume under worst-case operating conditions. For example, for the fan tray, power management budgets the amount of power required to run the fans at their maximum speed setting, even if the current fan speed is much lower.
- Manages the router for  $N+N$  power redundancy, which ensures uninterrupted system operation if one power supply fails.
- Provides power to host subsystem components, such as the Routing Engines, before it provides power to the FPCs.
- Manages the priority of individual FPCs. By assigning different priorities to the FPCs, you can determine which FPCs are more likely to receive power in the event of insufficient power.

### Power Priority of FPCs

The power priority of FPCs determines:

- The order in which FPCs are allocated power.
- How power is reallocated if there is a change in power availability or demand in an operating router.

This section covers:

- [How an FPC's Power Priority Is Determined on page 99](#)
- [FPC Priority and FPC Power Allocation on page 99](#)
- [FPC Priority and Changes in the Power Budget on page 99](#)

### How an FPC's Power Priority Is Determined

Using the CLI, you can assign an explicit power priority to an FPC slot. The power priority is determined by the slot number, with the lowest-numbered slots receiving power first. Thus, if you do not explicitly assign priorities to slots, power priority is determined by slot number, with slot 0 having the highest priority. See [“Configuring Power-On Sequence to Redistribute the Available Power” on page 109](#).

### FPC Priority and FPC Power Allocation

When a PTX5000 is powered on, power management allocates power to components according to its power budget policy. After power management has allocated power to the host subsystem components, it allocates the remaining available power to the FPCs. It powers on the FPCs in the configured order of priority until all FPCs are powered on or the available power provided by both the PDUs is exhausted. Thus if available power is exhausted before all FPCs receive power, higher-priority FPCs are powered on while lower-priority FPCs remain powered off.

FPCs that have been taken offline are not allocated power.



**NOTE:** Because power management does not allocate power to an FPC that has been taken offline, that FPC is brought online only when you commit a configuration. You must explicitly use the `request chassis fpc slot slot-number online` command to bring an FPC online that was taken offline previously.

If an FPC with a high priority in the priority sequence also has high-power requirement, and if the system does not have the required power available, then the lower priority FPCs with lower power requirements are also not powered on. This is to maintain consistency and also avoid powering off of the lower priority FPC when extra power is available. For example, if an FPC that requires 450 W has a higher priority than an FPC that requires 330 W, then the FPC with the lower power requirement (330 W) is also not powered on if the system does not have the required power to power the FPC that requires 450 W.

### FPC Priority and Changes in the Power Budget

In an operating router, power management dynamically reallocates power in response to changes in power availability or demand or changes in FPC priority. Power management uses the configured priority on FPC slots to determine how to reallocate power in response to the following events:

- When a new power supply is brought online, FPCs that were powered off because of insufficient power are powered on in the order of priority.

- When a user changes the assigned power priority of one or more FPCs when power is insufficient to meet the power budget, power management reruns the current power budget policy and powers FPCs on or off based on their priority. As a result, FPCs receive power strictly by the order of priority and previously operating FPCs might no longer receive power.
- When an FPC is installed, Junos OS does not automatically power on and bring the FPC online. This FPC stays in the offline state until the user brings it online through the CLI or by pushing the online button, and only if the available chassis power is more than the budgeted power for this FPC, the FPC becomes operational.

## Power Zones

In a PTX5000 equipped with high capacity PDUs and PSMs, there is one common zone that provides power to all FRUs and all FPCs. A high-capacity PDU can support up to eight PSMs and it does not support power zoning, unlike a normal-capacity PDU. All available PDU power is considered as a part of single zone. All PSMs provide power to the common zone. The PSM LEDs on the craft interface are interpreted as described in *PTX5000 Craft Interface LEDs*. After the PDU upgrade from the normal-capacity PDUs to High-Capacity PDUs, the power management converges all power zones into a single common zone. All FRU power is distributed based on the power available in the common zone.



**NOTE:** Presence of both normal-capacity PDUs and high-capacity PDUs is referred to as mixed-mode of operation and is supported only during the PDU upgrade.

To cater for the increase in the PIC power consumption, the power manager is enhanced to account for the PIC power separately from the FPC. The priority sequence for the PICs follows the priority sequence for the FPCs. That is, PICs installed in high-priority FPCs are given preference over PICs installed in low-priority FPCs. All PICs on an FPC have the same priority.



**NOTE:** You cannot mix existing PDUs with the High Capacity DC PDU.

## Power Supply Redundancy

By default, power management in PTX5000 routers is configured to manage the power supplies for  $N+N$  redundancy, by which power supplies are held in reserve for backup if the other power supplies are removed or fail.

When power is insufficient to meet the budgeted power requirements, power management raises alarms as follows:

- With power supply redundancy, when one PSM fails, it does not cause FPCs to go offline. Only the **No redundant power supply alarm** is raised. However, with no redundancy, FPCs can go offline depending on the total chassis power available at

that time. When an FPC or PIC goes offline due to insufficient power, which is indicated by **No power** in the output of the **show chassis fpc** command, then the **Insufficient Power - FRU(s) went offline** alarm is raised. The alarm gets cleared when there is sufficient power to bring up all the FPCs and PICs. The **Insufficient Power - FRU(s) went offline** alarm is raised when PSMs fail, when PSMs are powered off manually, or any time there is insufficient power for the system to power all the FPCs or PICs in the system.

- When power fails or when a PSM is removed, power management:
  - Calculates the total chassis power available from the remaining PSMs for the FPCs.
  - Powers off the FPCs based on the priority depending on the power budget for the FPCs and the FRUs and their configured power-on sequence.



**NOTE:** In the scenario where the available power is more than the budgeted power required by the FPC but less than its maximum power, the FPC is taken offline and then brought online, but one or more PICs in that FPC are not online.

- When a new PSM is inserted, power management:
  - Checks the power-on sequence of the FPCs and the PICs and brings any offline PICs online when power is available.
  - Powers on the FPCs based on the FPC's budgeted power and its power-on sequence depending on its priority.
  - Maintains the power for high-priority FPCs and their PICs by taking the low-priority FPCs offline when all the FPCs are brought online, depending on the available power.

Power management clears all alarms when sufficient power is available to meet normal operating and reserved power requirements.

#### Release History Table

Release	Description
14.1	Starting in Junos OS Release 14.1, the power management feature for PTX5000 routers ensures that at any time, the chassis power requirements do not exceed the available chassis power.

#### Related Documentation

- [Configuring Power-On Sequence to Redistribute the Available Power on page 109](#)
- [PTX5000 Craft Interface LEDs](#)

## Managing Power Allocated to PTX5000 FPCs on the Basis of Chassis Ambient Temperature Configuration

The power management feature of the PTX5000 Packet Transport Router is enhanced to manage the power supplied to the FPCs on the router by configuring the ambient temperature of the chassis. You can set the ambient temperature of the chassis at 25° C,

or 40° C. On system initialization, the power manager reads the ambient temperature and allocates power to the FPC according to the power budget policy at that temperature. If the actual power consumption of any FPC exceeds the configured value for more than three minutes, the power manager overrides the configured ambient temperature setting of that FPC, and resets its ambient temperature to the next higher level and reallocates power according to the new temperature setting. All the overshooting FPCs remain in the dynamic ambient temperature mode until the next reboot, or until you override it with a CLI command. The power manager then resets the power budget of the FRUs according to the configured ambient temperature setting.



**NOTE:** If the ambient temperature is not set, then, 55° C is considered as the default ambient-temperature and FPCs are assigned power according to the default ambient temperature.

For example, if the chassis ambient temperature is set to 25° C, the power manager allocates power to the FPCs according to the power budget policy at 25 ° C. If an FPC consumes more than 90% of the allocated power, an alarm—**Consumption > 90percent of allocated Budget**—is raised. If the FPC power consumption exceeds the allocated power for more than three minutes, the **PWR Range Overshoot** alarm is raised and the power manager reallocates power to that FPC according to the next higher temperature setting, that is, 40° C .



**NOTE:** During the PWR Range Overshoot alarm condition, you cannot reconfigure or delete the ambient temperature setting. You can reset the ambient temperature to the earlier setting after clearing the alarm condition by using the `request chassis power-manager reset ambient-config` command.



**NOTE:** If the PTX5000 chassis has redundant power supply modules, and if one PSM fails, the FPCs can still be online. Only the **No redundant power supply** alarm is raised.

If the PTX5000 chassis does not have redundant power supply modules, failure of one PSM can cause the FPCs to go offline, depending on the total chassis power available at that time.

**Related  
Documentation**

- [ambient-temperature on page 614](#)
- [Monitoring the Power Consumption of PTX5000 FPCs by Configuring the Ambient Temperature on page 105](#)



## Understanding How Dynamic Power Management Enables Better Utilization of Power

You can use the dynamic power management feature to better utilize the power available in the power entry module (PEM). Whether or not a new hardware component is powered on depends on the availability of power in the PEM. A component is not powered on if the PEM cannot meet the worst-case power requirement for that component. The dynamic power management feature is available in the following Junos OS Releases:

- MX Series routers—Junos OS Release 15.1R1 and later
- EX9200 switches—Junos OS Release 17.2R1 and later

The maximum power that each type of MIC consumes is maintained in a static database. The chassis daemon process (**chassisd**), which manages power budgeting for all line cards, uses this data when budgeting power for MICs. MICs are brought online only after the chassis daemon verifies that the worst-case power required for the MICs and the power required for all the online FRUs are available in the PEM.

In Junos OS Release 15.1R1, for MX Series routers, dynamic power management for MICs is disabled by default. You can enable the feature by enabling the **mic-aware-power-management** statement at the **[edit chassis]** hierarchy level. When dynamic power management is disabled, the chassis daemon checks for the worst-case power requirement of the MPC and the MICs before allocating power for the MPC. Whereas, when **mic-aware-power-management** statement is enabled, the chassis daemon considers the power requirement of only the MPCs. The worst-case power consumption by the MICs is not considered while the chassis daemon budgets power for the MPC. Power budgeting for MICs is done only after the MPC is powered on and the MICs come online. Every time you disable or enable dynamic power management, you must restart the chassis or the MPC for the changes to take effect.

In Junos OS Release 17.2R1, for EX9200 switches, dynamic power management for MICs is enabled by default.

Starting from Junos OS Release 17.3R1, for MX10003 routers, mic-aware dynamic power management is enabled by default.

Starting from Junos OS Release 18.2R1, for JNP10K-LC2101 MPC on MX10008 routers, dynamic power management is enabled by default. However, dynamic power management for MICs is not supported on JNP10K-LC2101 because JNP10K-LC2101 is a fixed configuration MPC and supports only built-in PICs.

After you enable the dynamic power management feature, use the **set chassis preserve-fpc-poweron-sequence** configuration mode command to preserve the sequence in which MPCs are powered on. This configuration is required to maintain the order in which the MPCs come online after a router or switch restart.



**NOTE:** In Junos OS Release 15.1F5 and later, dynamic power management is enabled by default on several MPCs. Models include MPC3E-3D-NG, MPC3E-3D-NG-Q, MPC2E-3D-NG, MPC2E-3D-NG-Q, MPC6E, MPC7E-MRATE, and MPC7E-10G on MX240, MX480, MX960, MX2010, and MX2020 and on MPC8E and MPC9E on MX2010, and MX2020 Universal Routing Platforms.

Release History Table

Release	Description
18.2R1	Starting from Junos OS Release 18.2R1, for JNP10K-LC2101 MPC on MX10008 routers, dynamic power management is enabled by default.
17.3R1	Starting from Junos OS Release 17.3R1, for MX10003 routers, mic-aware dynamic power management is enabled by default.
17.2R1	EX9200 switches—Junos OS Release 17.2R1 and later
17.2R1	In Junos OS Release 17.2R1, for EX9200 switches, dynamic power management for MICs is enabled by default.
15.1R1	MX Series routers—Junos OS Release 15.1R1 and later
15.1R1	In Junos OS Release 15.1R1, for MX Series routers, dynamic power management for MICs is disabled by default.
15.1F5	In Junos OS Release 15.1F5 and later, dynamic power management is enabled by default on several MPCs.

#### Related Documentation

- [Understanding How Configuring Ambient Temperature Helps Optimize Power Utilization on page 104](#)
- [preserve-fpc-poweron-sequence on page 746](#)

## Understanding How Configuring Ambient Temperature Helps Optimize Power Utilization

The key to managing power in network infrastructure is the efficient utilization of provisioned power. Provisioned power is the minimum power that is required to bring a router or a switch online. Junos OS determines the minimum required power by considering the worst-case power requirement for all the FRUs installed in the device. One of the methods to optimize the provisioned power on MX Series routers or EX9200 switches is to configure the device to operate at a cooler temperature. You can enable a device to operate at a lower operating temperature by configuring a lower ambient temperature.

Ambient temperature is the maximum operating temperature for a device. By configuring an ambient temperature, you can optimize power provisioned for the cooling system and the line cards. The maximum speed at which fans operate depends on the configured ambient temperature. As the fan speed increases, the power consumed by the fans increases. As a result, the device consumes more power when the temperature is high

because the fans run faster to maintain the operating temperature of the chassis within the configured limits.

When a router or a switch restarts, the system adjusts the power allocation or the provisioned power for the line cards on the basis of the configured ambient temperature. If enough power is not available, a minor chassis alarm is raised. However, the chassis continues to run with the configured ambient temperature. You can configure a new higher ambient temperature only after you make more power available by adding new power supply modules or by taking a few line cards offline. By using the provisioned power that is saved by configuring a lower ambient temperature, you can bring more hardware components online.

A specific ambient temperature value might not be applicable to a different geographical location, for example, in a colder region. For devices operating in colder regions, you can configure a lower ambient temperature, which helps reduce provisioned power significantly. However, in a region of higher temperature, you might need to configure a higher ambient temperature to ensure smooth functioning of the device. For example, if the router or switch operates in a colder region, you can set the ambient temperature to 25°C, which reduces the maximum fan speed, thereby reducing the maximum power consumption. Thus, by configuring an appropriate ambient temperature, you can reduce the provisioned power and save cost on network power infrastructure.

You can configure ambient temperature by using the **set chassis ambient-temperature (25C|40C|55C)** statement at the **[edit chassis]** hierarchy level. The default ambient temperature for MX Series routers and EX9200 switches is 40°C.

#### Related Documentation

- [ambient-temperature on page 614](#)
- [show chassis temperature-thresholds on page 2173](#)
- [Understanding How Dynamic Power Management Enables Better Utilization of Power on page 103](#)

## Monitoring the Power Consumption of PTX5000 FPCs by Configuring the Ambient Temperature

You can configure the ambient temperature of the PTX5000 chassis to manage power allocated to the FPCs. You can set the ambient temperature of the chassis at 25° C, or 40° C. On system initialization, the power manager reads the ambient temperature and allocates power to the FPCs according to the power budget policy at that temperature.

1. To configure the ambient temperature, include the **set chassis ambient-temperature 25|40|55** statement at the **[edit]** hierarchy level in the configuration mode:

```
[edit]
user@host# set chassis ambient-temperature 25|40
```

2. To verify the ambient temperature of the chassis, use the **show chassis ambient-temperature** command at the **[edit]** hierarchy level in the operational mode:

```
[edit]
user@host> show chassis ambient-temperature
```

Ambient Temperature: 25C

To verify the power consumption of the FPCs, use the following statements:

1. Use the **show chassis power detail | grep "FPC"** statement at the **[edit]** hierarchy level to view the power consumption of the FPCs.

```
user@host> show chassis power detail | grep "FPC"
```

```
FPC 0          448
FPC 1          419
FPC 2          373
FPC 3           0
FPC 4           0
FPC 5           0
FPC 6           0
FPC 7           0
```

Alternatively use the SNMP MIB command, **show snmp mib walk jnxOperatingFRUPower | grep "\.7\."** to view the power consumption of each FPC:

```
user@host> show snmp mib walk jnxOperatingFRUPower | grep "\.7\."
```

```
jnxOperatingFRUPower.4.1.7.0 = 0
jnxOperatingFRUPower.7.1.0.0 = 457          < ----- For FPC 0
jnxOperatingFRUPower.7.2.0.0 = 428          < ----- For FPC 1
jnxOperatingFRUPower.7.3.0.0 = 381          < ----- For FPC 2
jnxOperatingFRUPower.15.7.0.0 = 0
```

2. Use the **show chassis alarms** statement to view the alarms generated for any of the FPCs:

```
user@host> show chassis alarms
```

Alarm time	Class	Description
2007-04-08 05:51:12 UTC	Minor	FPC 1, Consumption > 90percent of allocated Budget
2007-04-08 05:51:12 UTC	Minor	FPC 0, Consumption > 90percent of allocated Budget
2007-04-08 05:50:26 UTC	Minor	FPC 0 SIB Link Error
2007-04-08 05:49:34 UTC	Minor	SIB 0 FPC Link Error
2007-04-08 05:48:02 UTC	Minor	No Redundant Power for FPC 0-7
2007-04-08 05:48:01 UTC	Minor	No Redundant Power for Rear Chassis
2007-04-08 05:48:01 UTC	Minor	No Redundant Power for Fan 0-2

If an FPC consumes more than 90% of the allocated power budget, the **Consumption > 90percent of allocated Budget** alarm is raised. FPC power consumption is measured at intervals of 65 seconds.



**NOTE:** Starting in Junos OS Release 18.4R1, the PTX5000 routers do not raise a chassis alarm in the following events:

- Power consumption by an FPC exceeds 90% of the allocated power budget.
- Power consumption by an FPC exceeds 100% of the allocated power budget (in this case, a system log is registered).



**NOTE:** If the PTX5000 chassis has redundant power supply modules, and if one PSM fails, the FPCs can still be online. Only the **No redundant power supply** alarm is raised.

If the PTX5000 chassis does not have redundant power supply modules, failure of one PSM can cause the FPCs to go offline, depending on the total chassis power available at that time.

3. When the power consumption of an FPC is more than the allocated budget for three consecutive intervals, the **Consumption > 90percent of allocated Budget** is cleared and **PWR Range Overshoot** alarms is raised for that particular FPC and the ambient temperature is set to the next higher setting.

```
user@host> show chassis alarms
```

```
9 alarms currently active
Alarm time      Class  Description
2007-04-08 05:56:38 UTC  Minor  FPC 2, Consumption > 90percent of allocated
Budget
2007-04-08 05:55:33 UTC  Minor  FPC 1, PWR Range Overshoot
2007-04-08 05:53:22 UTC  Minor  FPC 0, PWR Range Overshoot
2007-04-08 05:50:26 UTC  Minor  FPC 0 SIB Link Error
2007-04-08 05:49:34 UTC  Minor  SIB 0 FPC Link Error
2007-04-08 05:48:02 UTC  Minor  No Redundant Power for FPC 0-7
2007-04-08 05:48:01 UTC  Minor  No Redundant Power for Rear Chassis
2007-04-08 05:48:01 UTC  Minor  No Redundant Power for Fan 0-2
```



**NOTE:** **Consumption > 90percent of allocated Budget** alarms are updated according to the new ambient temperature setting but the chassis ambient temperature is not changed.

```
user@host> show chassis alarms
```

```
5 alarms currently active
Alarm time      Class  Description
2007-04-01 04:36:53 UTC  Minor  No Redundant Power for FPC 0-7
2007-04-01 04:36:52 UTC  Minor  No Redundant Power for Rear Chassis
2007-04-01 04:36:51 UTC  Minor  No Redundant Power for Fan 0-2
2007-04-01 04:36:47 UTC  Minor  PDU 1 Absent
```

- a. You can verify the temperature by using the **show chassis ambient-temperature** command.

```
user@host> show chassis ambient-temperature
```

```
Ambient Temperature: 25C
```

- b. Enter the configuration mode and check the configured ambient temperature. Use the **show chassis ambient temperature** operational mode command.

```
user@host# show chassis ambient temperature
```

```
Ambient Temperature: 25C
```

This is set to the last configured value.

- c. To clear the temperature set for the overshooting condition, use the **request chassis power-manager reset ambient-config** command.

```
user@host> request chassis power-manager reset ambient-config
```

Verify the ambient temperature after the reset.

```
show chassis ambient-temperature
```

```
Ambient Temperature: 25C
```

4. Verify the active alarms in the chassis by using the **show chassis alarms** command.

```
user@host> show chassis alarms
```

```
7 alarms currently active
```

Alarm time	Class	Description
2007-04-01 04:36:53 UTC	Minor	No Redundant Power for FPC 0-7
2007-04-01 04:36:52 UTC	Minor	No Redundant Power for Rear Chassis
2007-04-01 04:36:51 UTC	Minor	No Redundant Power for Fan 0-2
2007-04-01 04:36:47 UTC	Minor	PDU 1 Absent

#### Related Documentation

- [Managing Power Allocated to PTX5000 FPCs on the Basis of Chassis Ambient Temperature Configuration on page 101](#)
- [ambient-temperature on page 614](#)

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## Redistributing the Available Power by Configuring Power-On Sequence

Routers running on Junos OS Release 10.0 and later support an enhanced AC Power Entry Module (PEM) to provide the necessary power infrastructure to support up to twelve higher-capacity DPCs with higher port density and slot capacity. To support the cooling requirements for the enhanced AC PEMs, the routers support enhanced fan trays and fans.

The default behavior for MPC power-on sequence is slot number based, that is, slot 0 is brought online first followed by slot 1, slot 2 up to slot 11. For the scenarios, where it is running a mix of high capacity line cards (for core facing), and low capacity line cards

(for access facing) in their system, you can use the [fru-poweron-sequence](#) option to manually set the MPC power on sequence and hence ensure that the more important core facing line cards are brought online first irrespective of which slots these are in. This approach provides fine control over deterministically bringing up MPCs, however, it is heavy on configuration and entails to follow the discipline in slot to MPC mapping across all the systems.

The Junos OS enables you to configure the power-on sequence for the DPCs on an MX Series router chassis containing the new AC PEM. This enables you to redistribute the available power to the DPCs based on your requirements and the calculated power consumption of the DPCs. To configure the power-on sequence, refer to [“Configuring Power-On Sequence to Redistribute the Available Power” on page 109](#).

**Related Documentation**

- [fru-poweron-sequence on page 669](#)

## Configuring Power-On Sequence to Redistribute the Available Power

You can configure the power-on sequence for the Flexible PIC Concentrators (FPCs) on MX, PTX, and T routers. This configuration enables you to redistribute the available power to the FPCs on the basis of your requirements and the calculated power consumption of the FPCs.

To configure the power-on sequence:

1. At the **[edit chassis]** hierarchy level, configure the **fru-poweron-sequence** statement indicating the order in which the FPCs need to be powered on.

```
[edit chassis]
user@host# set fru-poweron-sequence fru-poweron-sequence
```

For example:

```
[edit chassis]
user@host# set fru-poweron-sequence "0 2 1"
```

2. Verify the configuration by using the **show** command at the **[edit chassis]** hierarchy level:

```
[edit chassis]
user@host# run show chassis power sequence
fru-poweron-sequence "0 2 1";
```



---

**NOTE:**

- If the configured sequence contains invalid numbers, Junos OS considers only the valid numbers in the sequence. The invalid numbers are silently discarded.
  - If the power-on sequence is not configured by including the `fru-poweron-sequence` statement, Junos OS uses the ascending order of the slot numbers of the FPCs as the sequence to power on the FPCs.
  - Issue the `show chassis power` command to view power limits and usage details for the FPCs.
- 

Related Documentation

- [fru-poweron-sequence on page 669](#)

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## Configuring the Six-Input DC Power Supply on T Series Routers

---

By default, the six-input DC power supply is configured to have all the six input feeds connected. You can also choose to provide four or five input feeds to the six-input DC power supply. When providing four or five input feeds on standalone routers, you need to configure the `feeds` statement at the `[edit chassis pem]` hierarchy level. When providing four or five input feeds to an LCC router in a routing matrix, you need to configure the `feeds` statement at the `[edit chassis lcc lcc-number pem]` hierarchy level.

Starting with Junos OS Release 12.3, the power management feature is enabled on T4000 routers with six-input DC power supply. The power management feature is enabled only when six input feeds with 40 amperes (A) each or four input feeds with 60 A each is configured on the router. To do this, you need to configure the `feeds` and `input-current` statements at the `[edit chassis pem]` hierarchy level.



---

**NOTE:**

- Before configuring input feeds for your router, see the *T640 Core Router Hardware Guide*, *T1600 Core Router Hardware Guide*, or *T4000 Core Router Hardware Guide* for special considerations and for the number of input feeds supported by the router.
  - The value assigned to the `feeds` statement must be equal to the number of input feeds provided to the power supply. Else, an alarm message is generated to indicate the mismatch.
-



The following procedures describe how to configure the six-input DC power supply on different routers:

- [Configuring the Six-Input DC Power Supply on an LCC Router in a Routing Matrix on page 111](#)
- [Configuring the Six-Input DC Power Supply on T640 and T1600 Routers on page 111](#)
- [Configuring the Six-Input DC Power Supply on T4000 Routers on page 112](#)

## Configuring the Six-Input DC Power Supply on an LCC Router in a Routing Matrix

To configure the six-input DC power supply on an LCC router in a routing matrix:

1. At the **[edit chassis lcc lcc-number pem]** hierarchy level, configure the **feeds** statement with the number of input feeds provided to the power supply.

```
[edit chassis lcc lcc-number pem]
user@host# set feeds number-of-input-feeds
```

For example:

```
[edit chassis lcc 1 pem]
user@host# set feeds 5
```



**NOTE:** All power supplies in the router must use the same number of inputs feeds.

2. Verify the configuration by using the **show** command at the **[edit chassis]** hierarchy level:

```
[edit chassis lcc 1 pem]
user@host# show
pem {
    feeds 5;
}
```

## Configuring the Six-Input DC Power Supply on T640 and T1600 Routers

To configure the six-input DC power supply on a standalone T640 or T1600 router:

1. At the **[edit chassis pem]** hierarchy level, configure the **feeds** statement with the number of input feeds provided to the power supply.

```
[edit chassis pem]
user@host# set feeds number-of-input-feeds
```

For example:

```
[edit chassis pem]
```

```
user@host# set feeds 5
```



**NOTE:** All power supplies in the router must use the same number of inputs feeds.

2. Verify the configuration by using the **show** command at the **[edit chassis]** hierarchy level:

```
[edit chassis]
user@host# show
pem {
    feeds 5;
}
```

## Configuring the Six-Input DC Power Supply on T4000 Routers

To configure the six-input DC power supply on a T4000 router:

1. At the **[edit chassis pem]** hierarchy level, configure the **feeds** statement with the number of input feeds provided to the power supply.

```
[edit chassis pem]
user@host# set feeds number-of-input-feeds
```

For example:

```
[edit chassis pem]
user@host# set feeds 4
```



**NOTE:** All power supplies in the router must use the same number of inputs feeds.

2. Configure the input current received by the router.

```
[edit chassis pem]
user@host# set input-current amps-in-each-feed
```

For example, if the router receives 60 A of input current:

```
[edit chassis pem]
user@host# set input-current 60
```



**NOTE:** You can connect three 80 A DC power cables to six-input DC power supply by using terminal jumpers. When you do this, ensure that you set the value of the `feeds` statement to 6 and that of the `input-current` statement to 40. If these configurations are not set, the power management feature is *not* enabled. For more information about the power management feature, see [“T4000 Power Management Overview” on page 95](#).

3. Verify the configuration by using the **show** command at the **[edit chassis]** hierarchy level:

```
[edit chassis]
user@host# show
pem {
    feeds 4;
    input-current 60;
}
```

#### Related Documentation

- [T4000 Power Management Overview on page 95](#)
- [Configuring Power-On Sequence to Redistribute the Available Power on page 109](#)
- [pem on page 731](#)
- [feeds on page 649](#)
- [input-current on page 681](#)
- [fru-poweron-sequence on page 669](#)



## CHAPTER 5

# Fabric Management Overview

- [Understanding Fabric Fault Handling on T4000 Router on page 116](#)
- [Fabric Fault Handling Overview on PTX5000 Packet Transport Router on page 119](#)
- [Fabric Plane Management on AS MLC Modular Carrier Card Overview on page 124](#)
- [Fabric Plane Management on MPC4E Overview on page 127](#)
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- [Example: Configuring Fabric Redundancy Mode on MPC4E on page 129](#)
- [Signaling Neighboring Routers of Fabric Down on T640 and T1600 Routers on page 131](#)
- [Fabric Resiliency and Degradation on page 132](#)
- [Detection and Recovery of Fabric-Related Failures Caused by Loss of Connectivity on MX Series Routers on page 135](#)
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- [Detection and Corrective Actions of Line Cards with Degraded Fabric on MX Series Routers on page 140](#)
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- [Disabling Line Card Restart to Limit Recovery Actions from Degraded Fabric Conditions on page 144](#)
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- [Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 145](#)
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- [Re-Enabling Fabric Grant Bypass on page 148](#)
- [Understanding the Smooth Upgrade Process on page 150](#)
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- [Fabric Management on MPC7E Overview on page 171](#)

## Understanding Fabric Fault Handling on T4000 Router

---

The T4000 router consists of a Switch Interface Board (SIB) with fabric bandwidth double the capacity of the T1600 router. The fabric fault management functionality is similar to that in T1600 routers. This topic describes the fabric fault handling functionality on T4000 routers.

The fabric fault management functionality involves monitoring all high-speed links connected to the fabric and the ones within the fabric core for link failures and link errors.

Action is taken based on the fault and its location. The actions include:

- Reporting link errors in system log files and sending this information to the Routing Engine.
- Reporting link failures at the Flexible Port Concentrator (FPC) or at the SIB and sending this information to the Routing Engine.
- Marking a SIB in **Check** state.
- Moving a SIB into **Fault** state.

The SIB in T4000 routers forms the core of the fabric with 4:1 redundancy—the redundant SIB becomes active when the active SIB becomes nonfunctional, is deactivated, or is removed. The following are the high-level indications of fabric faults that are monitored by Junos OS:

- An SNMP trap is generated whenever a SIB is reported as **Check** or **Fault**.
- **show chassis alarms**—Indicates that a SIB is in **Check** or **Fault** state.
- **show chassis sibs**—Indicates that a SIB is in **Check** or **Fault** state or that a SIB is in **Offline** state when the SIB initializes (this occurs when the SIB does not power on fully).
- **show chassis fabric fpcs**—Indicates whether any fabric links are in error on the FPCs' side.
- **show chassis fabric sibs**—Indicates whether any fabric links are in error on the SIBs' side.
- The `/var/log/messages` system log messages file at the Routing Engine has error messages with the prefix **CHASSISD\_FM\_ERROR**.
- The SIBs display the **FAIL** LED.



**NOTE:**

The fabric planes in the chassis determine whether the chassis is a T640 router, a T1600 router, or a T4000 router. Power entry modules (PEMs), FPCs, or fan trays do not determine chassis personality. Alarms are raised if the old PEMs or fan trays are present in a T4000 chassis. You can identify a router based on its fabric planes:

- If all planes present are F16-based SIBs, the chassis is a T640 chassis.
- If all planes present are SF-based SIBs, the chassis is a T1600 chassis.
- If all planes present are XF-based SIBs, the chassis is a T4000 chassis.

Note that mixing of fabric planes is not a supported configuration except during upgrade. You can change the personality of a chassis without a reboot by changing all the fabric planes and by issuing the `set chassis fabric upgrade-mode` CLI command to check the personality. If you do not issue the `set chassis fabric upgrade-mode` CLI command, the personality does not change until the next boot.

---

In T4000 routers, you come across the following faults:

- Board-level faults—These faults occur during initialization or during runtime. Power failure during board initialization, high-speed links transmit error, and polled I/O error during runtime are some examples of board-level faults.
- Link-level faults—These faults occur during initialization or during runtime. Link training failure at initialization time (failure of the data plane links between an FPC and a SIB to be trained when the FPC or SIB is initialized), error detected on the channel between the SIB and a Packet Forwarding Engine, cyclic redundancy check (CRC) errors detected at runtime, and Packet Forwarding Engine destination errors are types of link-level faults.
- Faults based on environmental conditions—These faults occur during runtime. Sudden removal of an FPC or a SIB might result in an operator error. When a SIB becomes too hot or when SIB voltages are beyond thresholds, the errors generated are classified into environmental errors.

You can implement one of the following options to handle the faults:

- Log the error and raise an alarm.
- Switch over to the spare plane, if available.
- Continue with a reduced number of parts of a plane.
- Continue with a reduced number of usable planes.
- Use polling-based fault handling.
- Monitor high-speed link errors and manually bring the link down to a suitable threshold.

The polled I/O errors and the link errors are monitored every 500 milliseconds, and the board exhaust temperature and board voltages are monitored every 10 seconds.

**Related  
Documentation**

- *Troubleshooting the T4000 SIBs*
- *Troubleshooting the T4000 FPCs*
- [show chassis alarms on page 925](#)
- [show chassis fabric fpcs on page 1412](#)
- [show chassis fabric sibs on page 1562](#)
- [show chassis sibs on page 2124](#)



## Fabric Fault Handling Overview on PTX5000 Packet Transport Router

Starting with Junos OS Release 14.1, the PTX5000 Packet Transport Router supports nine Switch Interface Boards (SIBs). Each FPC2-PTX-PIA FPC supports 1Tb per slot capacity, thereby resulting in a fabric bandwidth of 16 terabits per second (Tbps), full-duplex (8 Tbps of any-to-any, nonblocking, half-duplex) switching.

The fabric fault management functionality involves monitoring all high-speed links connected to the fabric and the ones within the fabric core for link failures and link errors.

The faults that occur in a PTX5000 can be broadly categorized into:

- Board faults—Faults that arise in a SIB or in an Flexible Port Concentrator (FPC) during initialization or during runtime, including issues that arise when a router component is accessing the SIB or FPC or issues that arise out of midplane failures.
- Link faults—Faults that occur on high-level links in a router during initialization or during runtime.
- Faults due to environmental conditions—Faults that occur because of overvoltage or over-temperature; faults that occur because of an operator mishandling a SIB or an FPC, and so on.

The router takes action on the basis of the fault category and the fault location. The actions include:

- Reporting link errors in system log files and sending this information to the Routing Engine.
- Displaying the link errors when you run one of the operational commands listed in [Table 21 on page 120](#):

**Table 21: List of Operational Mode Commands**

Operational mode command	Description
<code>show chassis sibs</code>	Displays Switch Interface Boards (SIBs) status information.
<code>show chassis fabric fpcs &lt;slot number&gt;</code>	Displays the fabric state of the specified FPC slot. If no slot number is provided, it displays the status of all FPCs.
<code>show chassis fabric sibs &lt;slot number&gt;</code>	Displays the state of the electrical switch fabric link between the SIBs and the FPCs.
<code>show chassis fabric reachability &lt;detail&gt;</code>	Displays the current state of fabric destination reachability.
<code>show chassis fabric unreachable-destinations</code>	Displays the list of destinations that have transitioned from a reachable state to an unreachable state.
<code>show pfe statistics error</code>	Displays Packet Forwarding Engine error statistics.
<code>show chassis fabric topology &lt;sib_slot&gt;</code>	Displays the input-output link topology.
<code>show chassis fabric summary</code>	Displays the state of all fabric planes and the elapsed uptime.

- Reporting link failures at the FPC level or at the SIB level and sending this information to the Routing Engine.
- Reporting link error information in the **show chassis alarms** operational command.
- Moving a SIB into *fault* state.

The following sections explain fabric fault handling functionality on the PTX5000:

- [SIB-Level Faults on page 121](#)
- [FPC-Level Faults on page 122](#)

## SIB-Level Faults

The following sections give a brief overview on the types of faults that occur on a SIB and how to handle them:

- [Types of Faults That Occur on a SIB on page 121](#)
- [Handling SIB-Level Faults on page 122](#)

### Types of Faults That Occur on a SIB

Board faults and link faults occur on a SIB during initialization and during runtime. Some faults occur because of environmental conditions such as overvoltage or over-temperature, or when an operator mishandles the SIB.



**NOTE:** Run the operational mode commands listed in [Table 21 on page 120](#) to detect faults.

During SIB initialization and runtime, the following faults might occur:

- Board faults, such as failure of SIBs to power up, ASICs reset failure, Switch Processor Mezzanine Board (SPMB) polled I/O access failure to ASICs, board component failures such as PIC failures, or router component access failures.
- Link faults such as high-level link errors that occur during link training.
- Faults that occur because of environmental conditions or because of mishandling of the SIB by the operator.

### Handling SIB-Level Faults

---

The following list illustrates how the router handles a fault that occurs on a SIB during initialization, during runtime, because of environmental conditions, and because of mishandling of the SIB by the operator:

- To handle a board fault on a SIB during initialization, the chassis daemon (chassisd) marks the SIB to be in *fault* state. After the SIB is marked as faulty, no operation occurs on this SIB.
- To handle a board fault on a SIB during runtime, chassisd logs an error in the system log file, raises an alarm indication error type, and marks the SIB as faulty. After the SIB is marked as faulty, no operation occurs on this SIB.
- To handle a link fault on a SIB during runtime, when a link error comes up during link training, chassisd informs the FPC corresponding to the link on which the error occurred to disable the links to the affected SIB. The chassisd then sends an error message to all the other FPCs in the router to stop using the failed SIB link and a link error alarm is generated. Note that when more than one FPC report errors for a given SIB, the SIB is disabled for all FPCs and no traffic is sent by the Packet Forwarding Engine through the affected SIB.
- To handle a link fault on a SIB during runtime, chassisd marks the SIB as faulty and specifies a reason for the error, and the SIB is disabled.
- In case of an environmental fault—overvoltage or over-temperature—the SIB is immediately taken offline. Note that an error is logged periodically as the temperature or voltage rises, and the SIB is taken offline when it crosses a certain threshold voltage or temperature.
- When a SIB is abruptly removed or dislodged, all the affected Packet Forwarding Engines stop using that plane to reach other Packet Forwarding Engines in the router.

### FPC-Level Faults

The following sections give a brief overview of the types of faults that occur on an FPC and how to handle them:

- [Types of Faults That Occur on an FPC on page 122](#)
- [Handling FPC-Level Faults on page 123](#)

#### Types of Faults That Occur on an FPC

---

Board faults and link faults occur on an FPC during initialization and during runtime. Some faults also occur because of environmental conditions such as overvoltage, over-temperature, or when the operator mishandles the FPC.



**NOTE:** Run the operational commands listed in [Table 21 on page 120](#) to detect faults.

---

During FPC initialization and runtime, the following faults might occur:

- Board faults such as failure of FPCs to power up, failure of ASICs to come out of reset phase, PMB polled I/O access failure to ASICs, board component failures such as PIC failure, or router component access failures.
- Link faults such as high-level link errors that occur during link training.
- Faults that occur because of environmental conditions or because of mishandling of an FPC by the operator.

Handling FPC-Level Faults

The following list illustrates how the router handles a fault that occurs on an FPC during initialization, during runtime, because of environmental conditions, and because of mishandling of the FPC by the operator:

- To handle a board fault on an FPC during initialization, chassisd marks the FPC to be in *fault* state. After the SIB is marked as faulty, no operation occurs on this FPC.
- To handle a board fault on an FPC during runtime, chassisd logs an error in the system log file, raises an alarm indication error type, and marks the FPC as faulty. After the FPC is marked as faulty, no operation occurs on this FPC.
- To handle onboard link errors on an FPC during initialization or during runtime, the FPC is taken down and all the affected Packet Forwarding Engines stop using that plane to reach other Packet Forwarding Engines in the router.



**NOTE:** No planes are taken down during initialization because the link training process for the fabric is not yet complete.

Onboard link errors during runtime are resolved on the basis of current configuration; either the FPC is rebooted or the error is logged and the FPC continues with initialization.

- In case of an environmental fault—over voltage or over-temperature—the FPC is immediately taken offline. Note that an error is logged periodically as the temperature or voltage rises, and the FPC is taken offline when it crosses a certain threshold voltage or temperature.
- When an FPC is abruptly removed or dislodged, all the other Packet Forwarding Engines stop sending traffic to the Packet Forwarding Engines in this FPC.

Release History Table

Release	Description
14.1	Starting with Junos OS Release 14.1, the PTX5000 Packet Transport Router supports nine Switch Interface Boards (SIBs).

Related Documentation

- *PTX5000 Description*

- *FPCs Supported on the PTX5000*
- *PTX5000 Switch Interface Board Description*

## Fabric Plane Management on AS MLC Modular Carrier Card Overview

The Application Services Modular Line Card (AS MLC) provides high application throughput and storage space, and is designed to run services on the MX240, MX480, and MX960 routers. The AS MLC consists of the following components:

- Application Services Modular Carrier Card (AS MCC)
- Application Services Modular Processing Card (AS MXC)
- Application Services Modular Storage Card (AS MSC)

The AS MCC plugs into the chassis and provides the fabric interface.

An MX960 router can support three Switch Control Boards (SCBs) or six fabric planes. The AS MCC supports six fabric planes. An MX240 or MX480 router can support up to two SCBs or two fabric planes. The AS MCC at any time can provide connectivity to only six of the eight fabric planes. Fabric planes 1 and 5, and 3 and 7 use shared physical links. So between fabric planes 1 and 5 only one plane can be active. Similarly between fabric planes 3 and 7, only one plane can be active.

This behavior impacts the output of fabric-related monitoring commands on MX240 and MX480 routers with AS MCCs.

The **show chassis fpc pic-status** command displays the output for an MX480 router with an AS MCC:

```
user@host>show chassis fpc pic-status
Slot 2   Online      MPC Type 1 3D Q
Slot 1   Online      AS-MCC
PIC 0    Online      AS-MS
PIC 2    Online      AS-MXC
Slot 4    Offline     MPC 3D 16x 10GE
Slot 5    Offline     AS-MCC
```

In the **show chassis fpc pic-status** command output, **Slot 1 and 5** are AS MCC, **PIC 0** is the AS MSC, and **PIC 2** is the AS MXC.

The **show chassis fabric fpcs** command displays the output on an MX480 router with an AS MCC.

```
user@hostshow chassis fabric fpcs
FPC 2
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
```

```

Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
FPC 4
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
    Plane 6: Links ok
    Plane 7: Links ok
  PFE #2
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
    Plane 6: Links ok
    Plane 7: Links ok
FPC 5
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Unused
    Plane 6: Plane enabled
    Plane 7: Unused

```

In the **show chassis fabric fpcs** command output, **FPC 5** is the AS MCC.

The **show chassis fabric plane** command displays the output on an MX480 router with an AS MCC.

```
user@host>show chassis fabric plane
```

```

Fabric management PLANE state
Plane 0
  Plane state: ACTIVE
    FPC 2
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 2 :Links ok
    FPC 5
      PFE 0 :Links ok
Plane 1
  Plane state: ACTIVE
    FPC 2
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 2 :Links ok
    FPC 5

```

```

        PFE 0 :Links ok
Plane 2
  Plane state: ACTIVE
    FPC 2
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 2 :Links ok
    FPC 5
      PFE 0 :Links ok
Plane 3
  Plane state: ACTIVE
    FPC 2
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 2 :Links ok
    FPC 5
      PFE 0 :Links ok
Plane 4
  Plane state: ACTIVE
    FPC 2
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 2 :Links ok
    FPC 5
      PFE 0 :Links ok
Plane 5
  Plane state: ACTIVE
    FPC 2
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 2 :Links ok
    FPC 5
      PFE 0 :Unused
Plane 6
  Plane state: ACTIVE
    FPC 2
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 2 :Links ok
    FPC 5
      PFE 0 :Links ok
Plane 7
  Plane state: ACTIVE
    FPC 2
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 2 :Links ok
    FPC 5
      PFE 0 :Unused
```

In the **show chassis fabric plane** output, **FPC 5** is the AS MCC.



The term **Unused** in the output for the **show chassis fabric fpcs** and **show chassis fabric plane** command indicates that one fabric plane from each pair that share physical links (1 and 5, and 3 and 7) is inactive.

See *Junos OS System Basics and Services Command Reference* for more information.

- Related Documentation**
- [show chassis fabric plane on page 1487](#)
  - [show chassis fabric fpcs on page 1412](#)

## Fabric Plane Management on MPC4E Overview

MPC4E is a fixed-configuration MPC that provides scalability in bandwidth and services capability of routers. MPC4E is supported on MX240, MX480, MX960, MX2010 and MX2020 routers. The MPC4E plugs into the chassis and provides the fabric interface.

By default, MX240 and MX480 routers with MPC4E support four active fabric planes each. However, this default fabric redundancy mode, also known as redundant fabric mode, makes the MPC run in reduced bandwidth state. In increased bandwidth mode, the MX240 and MX480 routers with MPC4E support six active fabric planes each. You can increase the number of active fabric planes by changing the mode from redundant fabric mode to increased bandwidth mode. To configure the MPC4E to function in increased bandwidth mode, use the existing **redundancy-mode increased-bandwidth** statement at the **[edit chassis fabric]** hierarchy level.

If you do not configure the fabric redundancy mode, MPC4E functions in redundant fabric mode. To configure the redundant fabric mode, use the existing **redundancy-mode redundant** statement at the **[edit chassis fabric]** hierarchy level.

An MX960 router can support three Enhanced MX Switch Control Boards (SCBEs) or six fabric planes. MX240 and MX480 routers can support up to two SCBEs or four fabric planes each. MX2020 routers can support eight Switch Fabric Boards (SFBs) or 24 fabric planes.

At any given time, on MX240 and MX480 routers, MPC4E can provide connectivity to only six of the eight fabric planes. Fabric planes 1 and 5 and fabric planes 3 and 7 use shared physical links. So, among fabric planes 1 and 5, only one plane can be active. Similarly, among fabric planes 3 and 7, only one plane can be active.

On MX240 and MX480 routers with MPC4E, if the fabric redundancy mode is not configured, then fabric planes 0, 1, 2, and 3 are online and active and fabric planes 4, 5, 6, and 7 are spare. If you configure the increased bandwidth mode, then the fabric planes 0, 1, 2, 3, 4, and 6 are active and fabric planes 5 and 7 are spare.

On MX960 routers with MPC4E, if you configure increased bandwidth mode, then fabric planes 0, 1, 2, 3, 4, and 5 are online. When MPC4E is plugged into an MX960 router, it does not have any fabric redundancy.

MX2020 routers with MPC4E do not support the existing **redundancy-mode** statement. Of the 24 fabric planes, all 24 planes are active.

- Related Documentation**
- [MPC4E on MX Series Routers Overview on page 27](#)
  - [Example: Configuring Fabric Redundancy Mode on MPC4E on page 129](#)
  - [redundancy-mode on page 761](#)
  - [show chassis fabric destinations on page 1372](#)
  - [show chassis fabric fpcs on page 1412](#)
  - [show chassis fabric plane on page 1487](#)
  - [show chassis fabric redundancy-mode on page 1553](#)
  - [show chassis fabric summary on page 1576](#)

---

## Fabric Plane Management on JNP10K-LC2101 Overview

JNP10K-LC2101 is a fixed-configuration MPC that provides increased port density and performance to MX10008 routers. JNP10K-LC2101 plugs into the chassis and provides the fabric interface.

An MX10008 router has six Switch Fabric Boards (SFBs). JNP10K-LC2101 has six Packet Forwarding Engines, each having 24 connections to the fabric (24 planes, or 4 connections per SFB). MX10008 routers with JNP10K-LC2101 will have 24 planes active when all the six SFBs are populated. However, in case of a failure of one SFB, the line rate can be achieved with 20 planes. The fabric supports a link speed of 25 Gbps.

The MX10008 SFB also supports fabric hardening. Fabric hardening is the process of controlling bandwidth degradation to prevent traffic black hole. The following key CLI commands are available for fabric hardening:

- **set chassis fpc slot-number fabric bandwidth-degradation percentage**—Configures the FPC to take a specific action once bandwidth degradation reaches a certain percentage to avoid causing a traffic black hole in the chassis.
- **set chassis fabric degraded detection-enable**—Enables detection of an FPC with degraded fabric.
- **set chassis fabric degraded action-fpc-restart-disable**—Disables line card restarts to limit recovery actions from a degraded fabric condition.

In MX10008 SFBs, fabric fault handling is supported per plane. Fabric fault handling per plane results in increased granularity, which helps identify, isolate, and repair faults. If an SFB has a single faulty plane, the other three planes can continue to operate. There is no need to take the entire SFB offline. For example, if a plane encounters a training failure error, the line card isolates that faulty plane; while the other planes continue to operate. Also, any cyclic redundancy check (CRC) errors on any link on the SFB are indicated on the plane, not on SFB.

- Related Documentation**
- [show chassis fabric destinations on page 1372](#)
  - [show chassis fabric fpcs on page 1412](#)

- [show chassis fabric plane on page 1487](#)
- [show chassis fabric summary on page 1576](#)

## Example: Configuring Fabric Redundancy Mode on MPC4E

- [Requirements for Configuration of the Fabric Redundancy Mode on MPC4E on page 129](#)
- [Overview on page 129](#)
- [Configuring Increased Bandwidth Mode on page 129](#)
- [Verification on page 130](#)

### Requirements for Configuration of the Fabric Redundancy Mode on MPC4E

This example uses the following hardware and software components:

- Junos OS Release 12.3 R2 or later for MX Series routers
- A single MX480 router with MPC4E

### Overview

This example provides information about configuring the fabric redundancy mode on an MX480 router with MPC4E. You can configure the MPC4E to function in redundant fabric mode or increased bandwidth mode. If you do not configure the mode, the MPC4E, by default, functions in redundant fabric mode. In redundant fabric mode, the number of active fabric planes is 4. If you configure the MPC4E to function in increased bandwidth mode, the number of active fabric planes increases to 6.

### Configuring Increased Bandwidth Mode

#### Step-by-Step Procedure

In this example, you configure increased bandwidth mode on an MX480 router with MPC4E. The existing fabric mode on the MX480 router is redundant fabric mode. To configure the fabric mode, perform the following tasks:

1. Verify the existing fabric mode of the router by using the **show chassis fabric mode** command.

```
user@host > show chassis fabric mode
Fabric Operating Mode :
    Redundant Fabric
```

2. View the number of active fabric planes by using the **show chassis fabric summary** command.

```
user@host > show chassis fabric summary
Plane  State      Uptime
0      Online    2 hours, 58 minutes, 22 seconds
1      Online    6 seconds
2      Online    32 seconds
3      Online    2 hours, 58 minutes, 23 seconds
```

4	Spare	31 seconds
5	Spare	21 seconds
6	Spare	18 seconds
7	Spare	9 seconds

**Note:**

For FPC slots with MPC Type 4 or MCC:

Fabric planes 1 and 5, 3 and 7 use shared physical links.  
Those slots may run in a reduced bandwidth in case both  
plane 1 and 5, or both 3 and 7 are active.

3. In configuration mode, go to the **[edit chassis]** hierarchy level and set the fabric mode to **increased-bandwidth** as follows:

```
[edit chassis]
user@host #set fabric redundancy-mode increased-bandwidth
```

**Results** In **redundant fabric** mode, the number of active fabric planes is 4 while the number of spare planes is also 4. In **increased-bandwidth** mode, the number of active planes is 6 while the number of spare planes is 2.



**NOTE:** Fabric planes 1 and 5 and fabric planes 3 and 7 use shared physical links. So, among fabric planes 1 and 5, only one plane can be active. Similarly, among fabric planes 3 and 7, only one plane can be active.

## Verification

To verify that the fabric mode of the MX480 router with MPC4E, perform the following tasks:

- [Verifying the Fabric Redundancy Mode of the Router on page 130](#)
- [Verifying the Number of Active Fabric Planes on page 131](#)

### Verifying the Fabric Redundancy Mode of the Router

**Purpose** To verify that the fabric redundancy mode of the MX480 router with MPC4E has been modified to **increased-bandwidth**.

**Action** To view the fabric mode of the router, use the **show chassis fabric mode** command.

```
user@host > show chassis fabric mode
Fabric redundancy mode: Increased Bandwidth
```

**Meaning** The MX480 router with MPC4E is functioning in increased bandwidth mode.

### Verifying the Number of Active Fabric Planes

**Purpose** To verify that the number of active fabric planes is 6.

**Action** To view the number of active fabric planes, use the **show chassis fabric summary** command.

```
user@host > show chassis fabric summary
```

Plane	State	Uptime
0	Online	2 hours, 55 minutes, 49 seconds
1	Online	2 hours, 55 minutes, 25 seconds
2	Online	2 hours, 58 minutes, 48 seconds
3	Online	2 hours, 55 minutes, 50 seconds
4	Online	2 hours, 55 minutes, 48 seconds
5	Spare	2 hours, 55 minutes, 40 seconds
6	Online	2 hours, 55 minutes, 37 seconds
7	Spare	2 hours, 55 minutes, 29 seconds

Note:

For FPC slots with MPC Type 4 or MCC:

Fabric planes 1 and 5, 3 and 7 use shared physical links.

Those slots may run in a reduced bandwidth in case both plane 1 and 5, or both 3 and 7 are active.

**Meaning** Number of active planes on the MX480 router with MPC4E is 6 (0, 1, 2, 3, 4, and 6) while the number of spare planes is 2.

- Related Documentation**
- [Fabric Plane Management on MPC4E Overview on page 127](#)
  - [show chassis fabric destinations on page 1372](#)
  - [show chassis fabric fpcs on page 1412](#)
  - [show chassis fabric plane on page 1487](#)
  - [show chassis fabric summary on page 1576](#)

### Signaling Neighboring Routers of Fabric Down on T640 and T1600 Routers

In JUNOS OS Release 10.4 and later, T640 and T1600 routers signal neighboring routers if they are unable to carry traffic due to all fabric planes being taken offline for one of the following reasons:

- CLI or button press initiated offline state.
- Automatically taken offline by the SPMB due to high temperature.
- PIO errors or voltage errors detected by the SPMB CPU to the SIBs.

The following scenarios are not supported:

- All PFEs get destination errors on all planes to all destinations, even with the Switch Interface Boards (SIBs) staying online.
- Complete fabric loss caused by destination timeouts, with the SIBs still online.

When chassisd detects all fabric planes are down, the router reboots all the FPCs in the system. When the FPCs come back up, the interfaces will not be created again, since all the fabric planes are down.

Once the user diagnoses and fixes the cause of all fabric planes going down, the user must then online the SIBs. The SIB online process brings up the interfaces.

Fabric down signaling to neighboring routers offers the following benefits:

- FPCs reboot when the control plane connection to the RE times out.
- Extends a simple approach to reboot FPCs when the dataplane blacks out.

When the router transitions from a state where SIBs are online or spare to a state where there are no SIBs in online state, then all the FPCs in the system are rebooted.

An ERRMSG indicates if all fabric planes are down and the FPCs will be rebooted if any fabric planes do not come up in 2 minutes.

An ERRMSG indicates the reason for FPC reboot on fabric connectivity loss.

The chassisd daemon traces when an FPC comes online, but PIC attach is not done due to no fabric plane present.

A warning is issued in the CLI when the last fabric plane is taken offline, that FPCs will reboot. You will need to online the SIBs after fixing the cause of the SIBs not being online. When the first SIB goes online, and link training with the FPCs completes, the interfaces will be created.

Fabric down signaling to neighboring routers functionality is available by default, and no user configuration required to enable it.

No CLI commands or alarms are required for this feature. Alarms indicate an SIBs offline system state to the user.

**Related Documentation**

- *Chassis-Level Feature Guide*

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## Fabric Resiliency and Degradation

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Juniper routers and switches have built in resiliency to tackle failures and error conditions encountered during normal operation. Immediate action is taken by JUNOS software to remedy the failure conditions to minimize traffic loss. No manual intervention is needed.

Fabric degradation could be one of the reasons leading to such error conditions. The following sections explain how the PFEs recover in a resilient manner from these failures.

- [Packet Forwarding Engine Errors and Recovery on PTX Series Routers on page 133](#)
- [Packet Forwarding Engine Errors and Recovery on T640, T1600 or TX Matrix Routers on page 133](#)

## Packet Forwarding Engine Errors and Recovery on PTX Series Routers

Packet Forwarding Engine destinations can become unreachable on PTX Series routers for the following reasons:

- The fabric Switch Interface Boards (SIBs) are offline as a result of a CLI command or a pressed physical button.
- The fabric SIBs are turned offline by the control board because of high temperature conditions.
- Voltage or polled I/O errors in the SIBs are detected by the control board.
- Unexpected link-training errors occur on all connected planes.
- Two Packet Forwarding Engines can reach the fabric but not each other.
- Link errors occur where two Packet Forwarding Engines have connectivity with the fabric but not through a common plane.

Starting with Junos OS Release 13.3, you can use PTX Series routers to configure Packet Forwarding Engine (PFE)-related error levels and the actions to perform when a specified threshold is reached.

If error levels are not defined, a PTX Series router begins the following phases in the recovery process:

1. SIB restart phase: The router attempts to resolve the issue by restarting the SIBs one by one. This phase does not start if the SIBs are functioning properly and a single line card is facing an issue.
2. SIB and line card restart phase: The router restarts both the SIBs and the line card. If there are line cards that are unable to initiate high-speed links to the fabric after reboot, it is not relevant to loss of live traffic as no interfaces are created for these line cards, preventing the system from issues.
3. Line Card offline phase: Because previous attempts at recovery failed, line cards and interfaces are turned off and the system avoids issues and error conditions.

## Packet Forwarding Engine Errors and Recovery on T640, T1600 or TX Matrix Routers

Packet Forwarding Engine destinations can become unreachable on T640, T1600 or TX Matrix routers for the following reasons:

- The fabric Switch Interface Boards (SIBs) are offline as a result of a CLI command or a pressed physical button.
- The fabric SIBs are turned offline by the Switch Processor Mezzanine Board (SPMB) because of high temperature conditions.
- Voltage or polled I/O errors in the SIBs are detected by the SPMB.
- All Packet Forwarding Engines receive destination errors on all planes from remote Packet Forwarding Engines, even when the SIBs are online.
- Complete fabric loss is caused by destination timeouts, even when the SIBs are online.

The recovery process consists of the following phases:

1. The router restarts the fabric planes one by one. This phase does not start if the fabric plane is functioning properly and a single line card has issues.
2. Fabric plane and Line Card restart phase: The router restarts both the SIBs and the line cards. If there are line cards that are unable to initiate high-speed links to the fabric after reboot, it is not relevant to loss of live traffic as no interfaces are created for these line cards, preventing the system from issues.
3. Line card offline phase: Because previous attempts at recovery failed, line cards and interfaces are turned off and the system avoids issues and error conditions leading to serious consequences.



**NOTE:** Starting in Junos OS Release 14.2R6, if a SIB becomes offline because of extreme conditions such as high voltage or high temperature, then as part of the recovery process, the router does not restart the fabric plane for that SIB.

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The phased recovery mechanism mentioned above is exhaustive unless there are other errors which could be correlated to these issues.

Starting in Junos OS Release 14.2R6, you can manage fabric degradation in single-chassis systems better by incorporating fabric self-ping and Packet Forwarding Engine liveness mechanisms. Fabric self-ping is a mechanism to detect issues in the fabric data path. Using the fabric self-ping mechanism, every Packet Forwarding Engine ascertains that a packet destined to itself is reaching it when the packet is sent over the fabric path. Packet Forwarding Engine liveness is a mechanism to detect whether a Packet Forwarding Engine is reachable on the fabric plane. To verify that it is reachable, the Packet Forwarding Engine sends a self-destined packet over the fabric plane periodically. If any error is detected by these two mechanisms, the fabric manager raises a *fabric degraded alarm* and initiates recovery by restarting the line card.



Release History Table

Release	Description
14.2R6	Starting in Junos OS Release 14.2R6, if a SIB becomes offline because of extreme conditions such as high voltage or high temperature, then as part of the recovery process, the router does not restart the fabric plane for that SIB.
14.2R6	Starting in Junos OS Release 14.2R6, you can manage fabric degradation in single-chassis systems better by incorporating fabric self-ping and Packet Forwarding Engine liveness mechanisms.
13.3	Starting with Junos OS Release 13.3, you can use PTX Series routers to configure Packet Forwarding Engine (PFE)-related error levels and the actions to perform when a specified threshold is reached.

**Related  
Documentation**

- [Disabling Line Card Restart to Limit Recovery Actions from Degraded Fabric Conditions on page 144](#)
- [degraded on page 629](#)
- [error on page 641](#)
- [fpc error on page 659](#)

## Detection and Recovery of Fabric-Related Failures Caused by Loss of Connectivity on MX Series Routers

Connectivity loss in a router occurs when the router is unable to transmit data packets to other neighboring routers, although the interfaces on that router continue to be in the active state. As a result, the other neighboring routers continue to forward traffic to the impacted router, which drops the arriving packets without sending a notification to the other routers.

When a Packet Forwarding Engine in a router is unable to send traffic to other Packet Forwarding Engines over the data plane within the same router, the router is unable to transmit any packets to a neighboring router, although the interfaces are advertised as active on the control plane. Fabric failure can be one of the reasons for the loss of connectivity.

The following fabric failure scenarios can occur:

- Removal of the control board
- High-speed link 2 (HSL2) training failures
- Single link failure on a line card
- Multiple link failures on the same line card or the same fabric plane
- Multiple link failures randomly on a line card or a fabric plane
- Intermittent cyclic redundancy check (CRC) errors
- A complete loss of connectivity for only one destination and not to other destinations

When a line card does not forward traffic due to a certain reason to other line cards within the device, the control protocol on the Routing Engine is unable to detect this condition. The traffic transmission is not diverted to the functional, active line cards and, instead, the packets are continued to be sent to the affected line card and are dropped at that point. The following might be the causes for a line card being unable to forward traffic:

- All the planes in the system are in the **Offline** or **Fault** state.
- All the Packet Forwarding Engines on the line card might have disabled the fabric streams due to destination errors.

If all the Switch Control Boards (SCBs) lose connectivity to the line cards, then all the interfaces are brought down. If a Packet Forwarding Engine of a line card loses complete connectivity to or from the fabric, then that line card is brought down.

System hardware failures can be of the following types:

- A single occurrence or a rare failure for a brief period (such as environmental spikes). This failure is effectively healed without manual intervention by restarting the fabric plane and restarting the line cards and the fabric plane, if necessary.
- Repeated failures that occur frequently.
- A permanent failure.

A recovery from any case of reduced throughput, such as multiple Packet Forwarding Engine destination timeouts on multiple planes is not attempted. Restoration of connectivity is attempted only when all the planes are in the **Offline** or **Fault** state or when the destinations are unreachable on all active planes.

If connectivity loss occurs because of a certain line card, which is either a common source or common destination of the destination timeout, and if you have configured the **action-fpc-restart-disable** statement at the **[edit chassis fabric degraded]** hierarchy level, no recovery action is taken. The **show chassis fabric reachability** command output can be used to verify the status of the fabric and the line card. An alarm is triggered to indicate that the particular line card is causing the connectivity loss.

## Fabric-Failure Detection Methods on MX Series Routers

The chassis daemon (chassisd) process detects the removal of a control board. The removal of the control board causes all the active planes that reside on that board to be disabled and a switchover is performed. If the active Routing Engine is also unplugged along with the control board, the detection of the control board removal is delayed until the switchover of the Routing Engine occurs and the reconnection in the primary, backup Routing Engine pair occurs. If the control board is turned offline by specifying the **request chassis cb slot slot-number offline** or a pressed physical button to cause a graceful shutdown, a fabric failure does not occur, even if the control board is moved to the offline state.

If active fabric planes are removed because of removal of the control board on the master RE, the line card takes the local action of disabling removed planes. If spare planes are available, line card initiates switchover to spare planes. If an active control board on a backup RE is removed, the master RE performs the switchover. The software attempts

to optimize the duration of connectivity loss by disabling all removed planes. The spare planes are transitioned to the online state one by one.

Fabric self-ping is a mechanism to detect any issues in the fabric data path. Each Packet Forwarding Engine forwards fabric data cells that are destined to itself over all active fabric planes. To transmit the data cell, the Packet Forwarding Engine fabric sends the request cells over an active plane and waits for a grant packet. The destination Packet Forwarding Engine sends a grant packet over the same plane on which the request cell is received. When the grant cell is received, the source Packet Forwarding Engine sends the data cell.

The Packet Forwarding Engine fabric contains the capability to detect grant delays. If grants are not received within a certain period of time, a destination timeout is declared. Destination timeout on a certain plane by a Packet Forwarding Engine on two or more line cards is considered as an indication for plane failures. Even if one Packet Forwarding Engine on a line card flashes an error, the line card is considered to be in error. Destination timeouts are noticed when the Packet Forwarding Engine sends traffic actively because requests are sent only for valid data cells. The software takes an appropriate action based on the destination timeout. For self-ping, a data cell is destined to the source Packet Forwarding Engine only.

Fabric ping failure messages are sent to the fabric manager on the Routing Engine, which collates all of the errors reported by all the line cards and takes a corrective action. For example, a ping failure for all links of the same line card might indicate a problem on the line card. Ping failure for multiple line cards for the same fabric plane might indicate a problem with the fabric.

If the Routing Engine determines that a fabric plane is down, based on the information on errors it receives from the line cards or the Packet Forwarding Engines, over a period of 5 seconds, it indicates a fabric failure. The duration of 5 seconds is the period for which the Routing Engine collates the errors from all of the line cards.

Fabric self-ping packets are periodically sent to check the sanity of the fabric links. Self pings are sent at interval of 500 ms. The destination timeout is also checked in intervals of 500 ms. If two timeouts occur successively, self ping failure is detected. When a destination timeout is received, the Packet Forwarding Engine fabric stops the sending of packets to the fabric. To examine the link condition again, the software resets the credits to ensure that new requests are sent again. When a self-ping failure occurs, the line card removes the affected plane from sending data to all destinations. This method ensures that self-ping is not attempted to be sent again on the defective plane.

The following guidelines apply to the self-ping capability:

- By default, self pings are not sent on spare fabric planes because spare planes do not carry traffic.
- The size of self-ping packets is large enough to enable the cells to be loaded over all the active fabric planes (maximum of 8 for MX Series routers).
- A detection of received self-ping packets is not performed.
- High priority queue is used to enable self-ping to be sent for oversubscription cases.

- Related Documentation**
- [Detection and Corrective Actions of Line Cards with Degraded Fabric on MX Series Routers on page 140](#)
  - [MX Series Routers Fabric Resiliency on page 138](#)
  - [redundancy-mode on page 761](#)
  - [show chassis fabric redundancy-mode on page 1553](#)
  - [Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 145](#)

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## MX Series Routers Fabric Resiliency

MX routers provide intelligent mechanisms to reduce packet loss in hardware failures scenarios.

This topic contains the following sections that describe fabric resiliency options, failure detection methods used, and corrective actions:

- [Fabric Connectivity Restoration on page 138](#)
- [Line Cards with Degraded Fabric on page 139](#)
- [Connectivity Loss Towards a Single Destination Only on page 139](#)
- [Redundancy Fabric Mode on Active Control Boards on page 140](#)

### Fabric Connectivity Restoration

Packet Forwarding Engine destinations can become unreachable for the following reasons:

- The control boards go offline as a result of a CLI command or a pressed physical button.
- The fabric control boards are turned offline because of high temperature.
- Voltage or polled I/O errors in the fabric.
- All Packet Forwarding Engines receive destination errors on all planes from remote Packet Forwarding Engines, even when the fabrics are online.
- Complete fabric loss caused by destination timeouts, even when the fabrics are online.

When the system detects any unreachable Packet Forwarding Engine destinations, fabric connectivity restoration is attempted. If restoration fails, the system turns off the interfaces to trigger local protection action or traffic re-route on the adjacent routers.

The recovery process consists of the following phases:

1. **Fabric plane restart phase:** Restoration is attempted by restarting the fabric planes one by one. This phase does not start if the fabric plane is functioning properly and an error is reported by one line card only. An error message is generated to specify that a connectivity loss is the reason for the fabric plane being turned offline. This phase is performed for fabric plane errors only.

2. Fabric plane and line card restart phase: The system waits for the first phase to be completed before examining the system state again. If the connectivity is not restored after the first phase is performed or if the problem occurs again within a duration of 10 minutes, connectivity restoration is attempted by restarting both the fabric planes and the line cards. If you configure the **action-fpc-restart-disable** statement at the **[edit chassis fabric degraded]** hierarchy level to disable restart of the line cards when a recovery is attempted, an alarm is triggered to indicate that connectivity loss has occurred. In this second phase, three steps are taken:
  1. All the line cards that have destination errors on a PFE are turned offline.
  2. The fabric planes are turned offline and brought back online, one by one, starting with the spare plane.
  3. The line cards that were turned offline are brought back online.
3. Line card offline phase: The system waits for the second phase to be completed before examining the system state again. Connectivity loss is limited by turning the line cards offline and by turning off interfaces because previous attempts at recovery have failed. If the problem is not resolved by restarting the line cards or if the problem recurs within 10 minutes after restarting the line cards, this phase is performed.

The three phases are controlled by timers. During these phases, if an event (such as offlining/onlining line cards or fabric planes) times out, then the phase skips that event and proceeds to the next event. The timer control has a timeout value of 10 minutes. If the first fabric error occurs in a system with two or more line cards, the fabric planes are restarted. If another fabric error occurs within the next 10 minutes, the fabric planes and line cards are restarted. However, if the second fabric error occurs outside of the timeout period of 10 minutes, then the first phase is performed, which is the restart of only the fabric planes.

In cases where all the destination timeouts are traced to a certain line card, for example, one source line card or one destination line card, only that line card is turned offline and online. The fabric planes are not turned offline and online. If another fabric fault occurs within the period of 10 minutes, the line card is turned offline.

By default, the system limits connectivity loss time by detecting severely degraded fabric. No user interaction is necessary.

## Line Cards with Degraded Fabric

You can configure a line card with degraded fabric to be moved to the offline state. On an MX960, MX480, or MX240 router, you can configure link errors or bad fabric planes. This configuration is particularly useful in partial connectivity loss scenarios where bringing the line card offline results in faster re-routing. To configure this option on a line card, use the **offline-on-fabric-bandwidth-reduction** statement at the **[edit chassis fpc slot-number]** hierarchy level. For more information, see [“Detection and Corrective Actions of Line Cards with Degraded Fabric on MX Series Routers” on page 140](#).

## Connectivity Loss Towards a Single Destination Only

In certain deployments, a line card indicates a complete connectivity loss towards a single destination only, but it functions properly for other destinations. Such cases are

identified and the affected line card is recovered. Consider a sample scenario in which the active planes are 0,1,2,3 and the spare planes are 4,5,6,7 in the connection between line card 0 and line card 1. If line card 0 has single link failures for planes 0 and 1 and if line card 1 has single link failures for planes 2 and 3, a complete connectivity loss occurs between the two line cards. Both line card 0 and line card 1 undergo a phased mode of recovery and fabric healing takes place.

## Redundancy Fabric Mode on Active Control Boards

You can configure the active control board to be in redundancy mode or in increased fabric bandwidth mode. To configure redundancy mode for the active control board, use the **redundancy-mode redundant** statement at the **[edit chassis fabric]** hierarchy level. In redundancy mode, all the line cards use 4 fabric planes as active planes, regardless of the type of the line card. You can enable increased fabric bandwidth of active control boards for optimal and efficient performance and traffic handling. On an MX960, MX480, or MX240 router, you can use the **redundancy-mode increased-bandwidth** statement at the **[edit chassis fabric]** hierarchy level to enable increased fabric bandwidth mode for the active control board to cause all the available fabric planes to be used. In this mode, the maximum number of available fabric planes are used for MX routers and the MPC3E. On MX960 routers with active control boards, 6 active planes are used, and on MX240 and MX480 routers with active control boards, 8 active planes are used.

Increased fabric bandwidth mode is enabled by default on MX routers with Switch Control Board (SCB). On MX routers with Enhanced SCB—SCBE—and the MPC3E, redundancy mode is enabled by default. For more information, see [“Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers” on page 145](#).

### Related Documentation

- [Detection and Corrective Actions of Line Cards with Degraded Fabric on MX Series Routers on page 140](#)
- [Detection and Recovery of Fabric-Related Failures Caused by Loss of Connectivity on MX Series Routers on page 135](#)
- [redundancy-mode on page 761](#)
- [show chassis fabric redundancy-mode on page 1553](#)
- [Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 145](#)

## Detection and Corrective Actions of Line Cards with Degraded Fabric on MX Series Routers

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You can configure a line card with degraded fabric to be moved to the offline state on an MX960, MX480, or MX240 router. Configuring this feature does not affect the system. You can configure this feature without restarting the line card or restarting the system.

The following scenarios can occur when you configure the feature to disable line cards with degraded fabric:

- If a line card has degraded fabric bandwidth and if you configure this capability to turn off such a line card after it has been operating with degraded fabric for some time, the corrective action is still taken.
- If a line card has been brought offline because of fabric errors and this functionality to move the line card to offline state is disabled, the line card is transitioned to the online state automatically.
- If a line card has been brought offline because of fabric errors and this functionality to move the line card to offline state is disabled or configured for some other line card, the line card that was turned offline is transitioned to the online state automatically.
- All the line cards that were brought offline because of degraded fabric, when you configured this setting, are brought back online when you commit any configuration under the **[edit chassis]** hierarchy level. Similarly, a restart of the chassis daemon or the Graceful Routing Engine switchover (GRES) operation also causes the line card that is disabled because of degraded fabric to be moved to the online state.

Degraded fabric indicates that a line card is operating with less than the required number of active fabric planes. If an line card is operating with less than four planes, it is considered to be degraded. This rule applies to all types of line cards and fabric. Degraded condition denotes that good fabric traffic exists at a reduced bandwidth.

The following conditions can result in degradation of fabric:

- The fabric control boards go offline as a result of an unintentional, abrupt power shutdown.
- An application-specific integrated circuit (ASIC) error, which causes a plane of a control board to be automatically turned offline.
- Manually bringing the fabric plane or the control board to the offline state.
- Removal of the control board
- Self-ping failure on any plane.
- HSL2 training failure for active plane.
- If a spare fabric plane has CRC errors, and this spare plane is made online, the link with the CRC error is disabled. This mechanism might cause a degradation in fabric in one direction and might cause a traffic black hole in the other direction.
- When a self-ping or HSL2 training failure occurs, the fabric plane is disabled for a particular line card and it is online for other line cards. This condition can also cause a traffic black hole.

If you need to remove the control board or move a fabric plane to the offline state during a system maintenance, you must enable the functionality to turn the line cards with degraded bandwidth to the offline state (by using the **offline-on-fabric-bandwidth-reduction** statement at the **[edit chassis fpc slot-number]** hierarchy level).

The following corrective actions are performed when a traffic black hole or fabric degradation occurs:

- Regardless of whether a spare control board is available or not, self-ping state for each line card is monitored at intervals of 5 seconds at the Routing Engine. Fabric manager uses the following rule to determine the presence of a spare control board:
  - MX960 routers with I-chip or I-chip and Trio-chip-based line cards that contain three control boards
  - MX240 or MX480 routers with I-chip or I-chip and Trio-chip-based line cards that contain two control boards
  - MX960, MX480, or MX240 routers that contain only Trio-based line cards are not considered to contain a spare control board

If during any such interval of 5 seconds, two line cards indicate a failure for the same plane, a switchover to the spare control board. In this case, the control board that reported errors is turned offline and the spare control board is turned online.

- If a spare control board is available, and if you configure the functionality to disable line cards with degraded fabric, self-ping state for each line card is monitored at intervals of 5 seconds at the Routing Engine. The following conditions can occur:
  - During any 5-second interval, if only one line card indicates a failure for a plane, the fabric Manager waits for the next interval. During the subsequent interval, if no other line card indicates a failure for the same plane, switchover of the control board is performed.
  - During any 5-second interval, if multiple line cards show failures for multiple control boards, the fabric manager waits for the next interval. During the subsequent interval, if the same condition remains, all the failing line cards are turned offline even if the spare control board is present.
  - During any 5-second interval, if any line card shows a failure for multiple planes on multiple control boards, the fabric manager waits for the next interval. During the subsequent interval, if the same condition persists, the line card is turned offline even if the spare control board is present.
- If spare planes are not available, the line card is turned offline when it displays a failure for a single plane or multiple planes. The line card is brought offline only if you previously configured the **offline-on-fabric-bandwidth-reduction** statement at the **[edit chassis fpc slot-number]** hierarchy level.

**Related  
Documentation**

- [Detection and Recovery of Fabric-Related Failures Caused by Loss of Connectivity on MX Series Routers on page 135](#)
- [MX Series Routers Fabric Resiliency on page 138](#)
- [redundancy-mode on page 761](#)
- [show chassis fabric redundancy-mode on page 1553](#)



## Managing Bandwidth Degradation

Certain errors result in packets being dropped by a system without notification. Other connected systems continue to forward traffic to the affected system, impacting network performance. A severely degraded fabric plane can be one of the reasons here.

By default, Juniper Networks routers attempt to start healing from such situations when the system detects issues with Packet Forwarding Engines. If the healing fails, the system turns off the interfaces, thereby preventing further escalations.

Junos OS software has the ability and the flexibility where a **bandwidth-degradation** configuration is available to detect and respond to fabric plane degradation in ways the user deems fit. Users can configure the router to specify which healing actions the router should take once such a condition is detected.

The **bandwidth-degradation** statement is configured with a percentage and an action. The **percent-age** value can range from 1 to 99, and it represents the percentage of fabric degradation needed to trigger a response from the line card. The **action** attribute determines the type of response the line card performs once fabric degradation reaches the configured percentage.

The statement is only configured with an **action** attribute, which triggers when the percentage of fabric degradation reaches 100 percent.

The following actions can be applied to either configuration statement:

- **log-only:** A message gets logged in the chassisd and message files when the fabric degradation threshold is reached. No other actions are taken.
- **restart:** The line card with a degraded fabric plane is restarted once the threshold is reached.
- **offline:** The line card with a degraded fabric plane is taken offline once the threshold is reached. The line card requires manual intervention to be brought back online. This is the default action if no action attribute configured.
- **restart-then-offline:** The line card with a degraded fabric plane is restarted once the threshold is reached, and if fabric plane degradation is detected again within 10 minutes, the line card is taken offline. The line card requires manual intervention to be brought back online.



**NOTE:** This feature is available in the Junos OS Release 15.1R1.

Related  
Documentation

- [bandwidth-degradation on page 608](#)

## Disabling Line Card Restart to Limit Recovery Actions from Degraded Fabric Conditions

You can disable line card restarts to limit recovery actions from a degraded fabric condition. On T640 and T1600 routers, only the fabric plane is restarted. On PTX Series routers, only the Switch Interface Boards (SIBs) are restarted. To disable the restarting of line cards, use the **action-fpc-restart-disable** statement at the **[edit chassis fabric degraded]** hierarchy level:

```
[edit chassis fabric]
degraded {
  action-fpc-restart-disable;
}
```

Whenever a line card restart is disabled, an alarm is raised when there are unreachable destinations present in the router, and you must restart the line cards manually.

To ensure that both the fabric planes (T640 and T1600 routers) or the SIBs (PTX Series routers) and the line cards are restarted during the recovery process, do not configure the **action-fpc-restart-disable** statement at the **[edit chassis fabric degraded]** hierarchy level.

**Related Documentation**

- [Fabric Resiliency and Degradation on page 132](#)

## Disabling an FPC with Degraded Fabric Bandwidth

You can bring an FPC with degraded fabric bandwidth offline to avoid causing a traffic black hole in the chassis for an extended time. To configure the option to disable an FPC with degraded bandwidth, use the **offline-on-fabric-bandwidth-reduction** statement at the **[edit chassis fpc slot-number]** hierarchy level:

```
[edit chassis]
fpc slot-number {
  offline-on-fabric-bandwidth-reduction;
}
```

The fabric manager checks the number of current active planes periodically. If the number of active planes is lower than the required number of active planes for a particular router, the system waits 10 seconds before it takes any corrective action. If the reduced bandwidth condition persists for an FPC and if this feature has been configured for the FPC, the system brings the FPC offline.

**Related Documentation**

- [offline-on-fabric-bandwidth-reduction on page 723](#)
- [Fabric Resiliency and Degradation on page 132](#)

## Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers

You can configure the active control board to be in redundancy mode or in increased fabric bandwidth mode. You can enable increased fabric bandwidth of active control boards for optimal and efficient performance and traffic handling by configuring the active control boards to be in redundancy mode. To configure redundancy mode for the active control board, use the **redundancy-mode redundant** statement at the **[edit chassis fabric]** hierarchy level:

```
[edit chassis fabric]
redundancy-mode {
  redundant;
}
```

When you configure this option, all the FPCs use 4 fabric planes as active planes, regardless of the type of the FPC.

To configure increased bandwidth mode for the active control board, use the **redundancy-mode increased-bandwidth** statement at the **[edit chassis fabric]** hierarchy level:

```
[edit chassis fabric]
redundancy-mode {
  increased-bandwidth;
}
```

In increased fabric bandwidth mode, MX Series routers will use 6 active planes. MX240 and MX480 routers will also use 2 spare planes in addition to the 6 active planes.

Increased fabric bandwidth mode is enabled by default on MX routers with Switch Control Board (SCB). On MX routers with Enhanced SCB—SCBE, regardless of the type of MPC or DPC installed on it, redundancy mode is enabled by default.

Configuring this feature does not affect the system. You can configure this feature without restarting the FPC or restarting the system.

- Related Documentation**
- [redundancy-mode on page 761](#)
  - [show chassis fabric redundancy-mode on page 1553](#)

## Understanding Fabric Grant Bypass

Module Port Concentrators (MPCs) contain one, two, or four Packet Forwarding Engines. Each Packet Forwarding Engine handles its forwarding decisions independently. Also, each Packet Forwarding Engine implements fabric queuing and flow control features required to communicate with other Packet Forwarding Engines on the same chassis. Packet Forwarding Engines use the fabric grant bypass feature to communicate with each other. For instance, when a Packet Forwarding Engine wants to send a packet to another Packet Forwarding Engine (on the same MPC or on a different MPC), a request is sent to the Packet Forwarding Engine across the fabric plane. After the request is granted, the source Packet Forwarding Engine sends the packet to the destination Packet Forwarding Engine.

On MX240, MX480, and MX960 routers with Switch Control Boards (SCB, SCBE, and SCBE2), the fabric grant bypass feature is disabled for all MPCs by default. On MX2010 and MX2020 routers with the Switch Fabric Board SFB2, the fabric grant bypass feature is disabled, by default, for all MPCs except MPC1 (MX-MPC1-3D), MPC2 (MX-MPC2-3D), and the 16-port 10-Gigabit Ethernet MPC (MPC-3D-16xGE-SFPP). On MX2010 and MX2020 routers with the Switch Fabric Board SFB, the fabric grant bypass feature is enabled for all MPCs by default. When the fabric grant bypass feature is enabled by default, the source Packet Forwarding Engine has to wait for the fabric plane to grant the request before the packet can be sent to the destination Packet Forwarding Engine. Waiting for the request to be granted can impact system behavior and performance.

Table 22 on page 146 describes the fabric grant bypass behavior on MX Series routers.

**Table 22: Fabric Grant Bypass Behavior on MX Series Routers**

MX Series Routers	Switch Control Board	Switch Fabric Board	Default Fabric Grant Bypass Behavior
MX240, MX480, and MX960	SCB, SCBE, MX-SCBE2	-	Disabled for all MPCs.
MX2010 and MX2020	-	SFB	Enabled for all MPCs.
MX2010 and MX2020	-	SFB2	Enabled for MPC1 (MX-MPC1-3D), MPC2 (MX-MPC2-3D), and 16-port 10-Gigabit Ethernet MPC (MPC-3D-16xGE-SFPP). Disabled for all other MPCs.

Starting in Junos OS Release 16.1, you can disable the fabric grant bypass feature on the MX2020 and MX2010 routers with SFBs. Disabling the default fabric grant bypass feature controls congestion and thus improves system behavior and performance on these routers. After disabling the feature, you must reboot the router for the changes to take effect.



**NOTE:** After you disable the fabric grant bypass feature and reboot the router, existing MPCs where the fabric grant bypass feature is enabled by default—such as MPC1 (MX-MPC1-3D), MPC2 (MX-MPC2-3D), and the 16-port 10-Gigabit Ethernet MPC (MPC-3D-16xGE-SFPP)—do not power on.

You can re-enable the fabric grant bypass feature on the MX2020 and MX2010 routers. After enabling the feature, you must reboot the router for the changes to take effect. If the router has existing MPCs where the fabric grant bypass feature is enabled by default—such as MPC1 (MX-MPC1-3D), MPC2 (MX-MPC2-3D), and the 16-port 10-Gigabit Ethernet MPC (MPC-3D-16xGE-SFPP)—these MPCs power on after the reboot.

**Related Documentation**

- [Disabling Fabric Grant Bypass to Control Congestion and Improve Performance on page 147](#)
- [disable-grant-bypass on page 633](#)

## Disabling Fabric Grant Bypass to Control Congestion and Improve Performance

You can disable the fabric grant bypass feature on the MX2020 and MX2010 routers with SFBs. Disabling the default fabric grant bypass feature controls congestion and thus improves system behavior and performance on MX2010 and MX2020 routers. After disabling the feature, you must reboot the router for the changes to take effect.



**NOTE:** After you disable the fabric grant bypass feature and reboot the router, existing MPCs on the router where the fabric grant bypass feature is enabled by default—such as MPC1 (MX-MPC1-3D), MPC2 (MX-MPC2-3D), and the 16-port 10-Gigabit Ethernet MPC (MPC-3D-16xGE-SFPP)—do not power on.

To disable fabric grant bypass to control congestion and improve system behavior and performance:

1. Disable fabric grant bypass by including the **fabric disable-grant-bypass** statement at the **[edit chassis]** hierarchy level.

```
[edit chassis]
user@host# set fabric disable-grant-bypass
```

2. After disabling fabric grant bypass, commit the configuration.

```
[edit chassis]
user@host# commit
```



**NOTE:** After you disable fabric grant bypass and commit the configuration, the router displays the following warning message:

[edit]

'chassis'

**WARNING:** Chassis configuration for fabric grant bypass has been changed. A system reboot is mandatory. Please reboot the system NOW. Continuing without a reboot might result in unexpected system behavior. commit complete

3. Reboot the router for the configuration to take effect.

```
user@host> request system reboot
```

To re-enable fabric grant bypass feature on the MX2020 and MX2010 routers, use the **delete chassis fabric disable-grant-bypass** command. After enabling the feature, you must reboot the router for the changes to take effect. If the router has existing MPCs where the fabric grant bypass feature is enabled by default—such as MPC1 (MX-MPC1-3D), MPC2 (MX-MPC2-3D), and the 16-port 10-Gigabit Ethernet MPC (MPC-3D-16xGE-SFPP)—these MPCs power on after the reboot.

#### Related Documentation

- [Understanding Fabric Grant Bypass on page 146](#)
- [disable-grant-bypass on page 633](#)
- [Re-Enabling Fabric Grant Bypass on page 148](#)

## Re-Enabling Fabric Grant Bypass

After you disable the fabric grant bypass feature, you can re-enable the feature on the MX2020 and MX2010 routers with SFBs. This is the default behavior on these routers.



**NOTE:** After you enable the fabric grant bypass feature and reboot the router, existing MPCs on the router where the fabric grant bypass feature is enabled by default—such as MPC1 (MX-MPC1-3D), MPC2 (MX-MPC2-3D), and the 16-port 10-Gigabit Ethernet MPC (MPC-3D-16XGE-SFPP)—power on.

To re-enable fabric grant bypass:

1. Use the **delete** statement with the **fabric disable-grant-bypass** statement at the [edit chassis] hierarchy level to enable fabric grant bypass.

```
[edit chassis]
user@host# delete fabric disable-grant-bypass
```

2. After enabling fabric grant bypass, commit the configuration.

```
[edit chassis]
user@host# commit
```



**NOTE:** After you enable fabric grant bypass and commit the configuration, the router displays the following warning message:

```
[edit]
```

```
'chassis'
```

**WARNING:** Chassis configuration for fabric grant bypass has been changed. A system reboot is mandatory. Please reboot the system NOW. Continuing without a reboot might result in unexpected system behavior. commit complete

3. Reboot the router for the configuration to take effect.

```
user@host> request system reboot
```

To disable fabric grant bypass feature on the MX2020 and MX2010 routers, use the **set chassis fabric disable-grant-bypass** command. After disabling the feature, you must reboot the router for the changes to take effect. If the router has existing MPCs where the fabric grant bypass feature is enabled by default—such as MPC1 (MX-MPC1-3D), MPC2 (MX-MPC2-3D), and the 16-port 10-Gigabit Ethernet MPC (MPC-3D-16xGE-SFPP)—these MPCs do not power on after the reboot.

#### Related Documentation

- [Understanding Fabric Grant Bypass on page 146](#)
- [disable-grant-bypass on page 633](#)
- [Disabling Fabric Grant Bypass to Control Congestion and Improve Performance on page 147](#)

## Understanding the Smooth Upgrade Process

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The MX2000 line of routers support Switch Fabric Board (SFB; model number: MX2000-SFB) and the enhanced Switch Fabric Board (SFB2; model number: MX2000-SFB-S). SFB2 is designed to support higher bandwidth than that provided by SFB on the MX2000 line of routers. For instance, the MX2000 line of routers with SFB support fabric bandwidth of 800 Gbps. However, the MX2000 line of routers with SFB2 can support fabric bandwidth of 1.92 Tbps. A smooth upgrade enables you to upgrade from SFB to SFB2 with minimal traffic impact on the MX2000 line of routers.



**NOTE:** If you have installed the Junos Continuity software package, you cannot perform a smooth upgrade from Switch Fabric Board (SFB) to Enhanced Switch Fabric Board (SFB2) on MX2010 and MX2020 routers.

This topic explains the smooth upgrade process that takes place when you upgrade from Switch Fabric Board (SFB) to enhanced Switch Fabric Board (SFB2) on MX2000 line of routers.



**NOTE:** The MX2000 line of routers support either SFB or SFB2 only. The MX2000 line of routers do not support SFB and SFB2 at the same time. However, during an upgrade from SFB to SFB2, the MX2000 line of routers support both SFB and SFB2 at the same time for the duration of the upgrade. But, you must upgrade all 8 SFBs to 8 SFB2s. You cannot replace 4 SFBs with 4SFB2s and retain the other SFBs.

The process of smooth upgrade from SFB and SFB2 includes the following steps:

1. Initiating the smooth upgrade process. When you initiate smooth upgrade, the router can support both SFB and SFB2 at the same time.
2. Performing the smooth upgrade. This step consists of replacing all SFBs with SFB2s.
3. Terminating the smooth upgrade. When you terminate the smooth upgrade process, the router stops supporting SFB and SFB2 at the same time.

A smooth upgrade provides the following benefits:

- The smooth upgrade eliminates network downtime during the smooth upgrade window because of 7+1 fabric redundancy. When one SFB is being upgraded to SFB2, the other seven SFBs are available to handle the traffic.



**NOTE:** If multiple SFBs are upgraded at the same time, multiple fabric planes are down at any specified time and so traffic is impacted.



- When multiple fabric boards and planes come online at the same time, you can batch them together and train. This reduces the booting up time and the time taken for the plane to come online.
- On MX2000 line of routers with SFB, fabric grant bypass is enabled by default. Disabling fabric grant bypass helps control congestion and improves performance. On MX2000 line of routers with SFB, you can disable fabric grant bypass by default, fabric grant bypass is disabled for all MPCs on MX2000 line of routers when they connect to SFB2. Fabric grant bypass is enabled by default on MPC1 (MX-MPC1-3D), MPC2 (MX-MPC2-3D), and the 16-port 10-Gigabit Ethernet MPC (MPC-3D-16xGE-SFPP). When fabric grant bypass is enabled by default, when those MPCs connect to SFB2, fabric grant bypass continues to be enabled and cannot be disabled.

To quickly access the information you need, click the links in [Table 23 on page 151](#).

**Table 23: Locating the Information You Need to Work on Smooth Upgrade Process**

Task You Need to Perform	Where The Information Is Located
Before You begin	<a href="#">“Before you Begin the Smooth Upgrade Process” on page 151</a>
Perform a Smooth Upgrade	<a href="#">“Performing a Smooth Upgrade to Enhanced Switch Fabric Board (SFB2) with Minimal Impact on Traffic” on page 160</a>

**Related Documentation**

- [Understanding Fabric Grant Bypass on page 146](#)
- [Disabling Fabric Grant Bypass to Control Congestion and Improve Performance on page 147](#)
- [Before you Begin the Smooth Upgrade Process on page 151](#)
- [Performing a Smooth Upgrade to Enhanced Switch Fabric Board \(SFB2\) with Minimal Impact on Traffic on page 160](#)

**Before you Begin the Smooth Upgrade Process**

Before you begin the smooth upgrade from Switch Fabric Board (SFB) to enhanced Switch Fabric Board (SFB2), complete the following tasks:



**NOTE:** If you have installed the Junos Continuity software package, you cannot perform a smooth upgrade from Switch Fabric Board (SFB) to Enhanced Switch Fabric Board (SFB2) on MX2010 and MX2020 routers.

- Prepare the router and install the version of Junos OS Release (16.1R1 or later) that supports the smooth upgrade process. For more information about how to install or upgrade the version of Junos OS Release, see *Installing the Software Package on a Router with Redundant Routing Engines*.
- Verify that the Switch Fabric Boards and fabric planes are online and operational. At this time, the line cards are connected to SFB.

1. To verify that all the switch fabric boards (SFBs) are online and operational, issue the following command:

```
user@host> show chassis hardware
```

```
Hardware inventory:
```

Item	Version	Part number	Serial number	Description
Chassis			JN11E0A50AFJ	MX2020
Midplane	REV 01	711-032387	abcd1111	Lower Backplane
Midplane 1	REV 04	711-032386	ABAB9191	Upper Backplane
PMP 1	REV 05	711-032428	ACAJ1526	Upper Power Midplane
PMP 0	REV 04	711-032426	ACAJ1585	Lower Power Midplane
FPM Board	REV 06	760-040242	ABBT8836	Front Panel Display
PSM 0	REV 01	740-050037	1EDB32101E3	DC 52V Power Supply
Module				
PSM 1	REV 01	740-033727	1E012130107	DC 52V Power Supply
Module				
PSM 2	REV 01	740-050037	1EDB3210162	DC 52V Power Supply
Module				
PSM 3	REV 01	740-050037	1EDB32000R6	DC 52V Power Supply
Module				
PSM 4	REV 01	740-050037	1EDB313005M	DC 52V Power Supply
Module				
PSM 5	REV 01	740-050037	1EDB321016G	DC 52V Power Supply
Module				
PSM 6	REV 01	740-050037	1EDB313005F	DC 52V Power Supply
Module				
PSM 7	REV 01	740-050037	1EDB313009X	DC 52V Power Supply
Module				
PSM 8	REV 01	740-050037	1EDB3130082	DC 52V Power Supply
Module				
PSM 9	REV 01	740-050037	1EDB32101HH	DC 52V Power Supply
Module				
PSM 10	REV 01	740-050037	1EDB321015G	DC 52V Power Supply
Module				
PSM 11	REV 01	740-050037	1EDB32101JW	DC 52V Power Supply
Module				
PSM 12	REV 01	740-045050	1E02224000N	DC 52V Power Supply
Module				
PSM 13	REV 01	740-050037	1EDB321015C	DC 52V Power Supply
Module				
PSM 14	REV 01	740-050037	1EDB321015J	DC 52V Power Supply
Module				
PSM 15	REV 01	740-045050	1E022240015	DC 52V Power Supply
Module				
PSM 16	REV 01	740-045050	1E02224000L	DC 52V Power Supply
Module				
PSM 17	REV 01	740-050037	1EDB32101EP	DC 52V Power Supply
Module				
PDM 1	REV 03	740-045234	1EFA3230588	DC Power Dist Module
PDM 2	REV 03	740-045234	1EFA3230508	DC Power Dist Module
Routing Engine 0	REV 02	740-041821	9009115214	RE-S-1800x4
Routing Engine 1	REV 02	740-041821	9009099720	RE-S-1800x4
CB 0	REV 23	750-040257	CAAR5968	Control Board
CB 1	REV 12	750-040257	CAAD9498	Control Board
SPMB 0	REV 02	711-041855	ABCC1066	PMB Board
SPMB 1	REV	711-041855	ABBS1488	PMB Board
SFB 0	REV 06	711-044466	ABCD4944	Switch Fabric Board
SFB 1	REV 06	711-044466	ABCD4938	Switch Fabric Board
SFB 2	REV 06	711-044466	ABCD5175	Switch Fabric Board
SFB 3	REV 06	711-044466	ABCD5160	Switch Fabric Board

SFB 4	REV 06	711-044466	ABCD4997	Switch Fabric Board
SFB 5	REV 06	711-044466	ABCD5013	Switch Fabric Board
SFB 6	REV 06	711-044466	ABCD5267	Switch Fabric Board
SFB 7	REV 06	711-044466	ABCD4968	Switch Fabric Board
FPC 0	REV 23	750-054901	CAEH6678	MPC3E NG HQoS
CPU	REV 11	711-045719	CAEA4592	RMPC PMB
MIC 0	REV 26	750-028392	ZM0999	3D 20x 1GE(LAN) SFP
PIC 0		BUILTIN	BUILTIN	10x 1GE(LAN) SFP
Xcvr 0	REV 01	740-031469	17T446600017	SFP-LX10
Xcvr 1	REV 01	740-031469	17T446600120	SFP-LX10
Xcvr 2	REV 01	740-031469	19T446600010	SFP-LX10
Xcvr 3	REV 01	740-031469	0ZT446600018	SFP-LX10
Xcvr 4	REV 01	740-031469	19T446600007	SFP-LX10
Xcvr 5	REV 01	740-031469	18T446600081	SFP-LX10
Xcvr 6	REV 01	740-031469	18T446600088	SFP-LX10
Xcvr 7	REV 01	740-031469	18T446600049	SFP-LX10 Xcvr 8
REV 01	740-031469	18T446600002	SFP-LX10	
Xcvr 9	REV 01	740-031469	19T446600008	SFP-LX10
PIC 1		BUILTIN	BUILTIN	10x 1GE(LAN) SFP
Xcvr 0	REV 01	740-031469	18T446600032	SFP-LX10
Xcvr 1	REV 01	740-031469	09T446600025	SFP-LX10
Xcvr 2	REV 01	740-031469	19T446600004	SFP-LX10
Xcvr 3	REV 01	740-031469	18T446600084	SFP-LX10
Xcvr 4	REV 01	740-031469	18T446600060	SFP-LX10
Xcvr 5	REV 01	740-031469	17T446600085	SFP-LX10
Xcvr 6	REV 01	740-031469	17T446600014	SFP-LX10
Xcvr 7	REV 01	740-031469	17T446600315	SFP-LX10
Xcvr 8	REV 01	740-031469	18T446600043	SFP-LX10
Xcvr 9	REV 01	740-031469	0ZT446600017	SFP-LX10
MIC 1	REV 19	750-033199	CAAJ1818	1X100GE CFP
PIC 2		BUILTIN	BUILTIN	1X100GE CFP
FPC 1	REV 32	750-028467	ZR1986	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ZT7025	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	AMH0285	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 1	REV 01	740-031980	AHK011H	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	APK0569	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
FPC 2	REV 04	750-044444	ZA7865	MPCE Type 2 3D P
CPU	REV 02	711-038484	ZB2728	MPCE PMB 2G
MIC 0	REV 07	750-028390	XY2158	3D 40x 1GE(LAN) RJ45
PIC 0		BUILTIN	BUILTIN	10x 1GE(LAN) RJ45
PIC 1		BUILTIN	BUILTIN	10x 1GE(LAN) RJ45
PIC 2		BUILTIN	BUILTIN	10x 1GE(LAN) RJ45
PIC 3		BUILTIN	BUILTIN	10x 1GE(LAN) RJ45
MIC 1				
QXM 0	REV 05	711-028408	ZC3420	MPC QXM
QXM 1	REV 05	711-028408	ZC3350	MPC QXM
FPC 3	REV 22	750-054564	CADG6972	MPC5E 3D 2CGE+4XGE
CPU	REV 11	711-045719	CADC7599	RMPC PMB
PIC 0		BUILTIN	BUILTIN	2X10GE SFPP OTN
Xcvr 0	REV 01	740-031980	193363A00483	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	1YT517101829	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	1X100GE CFP2 OTN
Xcvr 0	REV 01	740-052505	XUF0GPX	CFP2-100G-SR10
PIC 2		BUILTIN	BUILTIN	2X10GE SFPP OTN
PIC 3		BUILTIN	BUILTIN	1X100GE CFP2 OTN

FPC 6	REV 11	750-045372	CABT0840	MPCE Type 3 3D
CPU	REV 08	711-035209	CABL0889	HMPC PMB 2G
MIC 0	REV 27	750-028392	CABR4723	3D 20x 1GE(LAN) SFP
PIC 0		BUILTIN	BUILTIN	10x 1GE(LAN) SFP
Xcvr 0	REV 01	740-011782	P9229UM	SFP-SX
Xcvr 1	REV 01	740-011782	P9P0X6V	SFP-SX
Xcvr 2	REV 01	740-011613	PCE01W5	SFP-SX
Xcvr 4	REV 01	740-011613	PD63DEN	SFP-SX
Xcvr 5	REV 02	740-011613	PG12FSF	SFP-SX
Xcvr 7	REV 01	740-011782	PCL3UDY	SFP-SX
Xcvr 8	REV 01	740-011613	PE713Z9	SFP-SX
Xcvr 9	REV 01	740-011613	AM0846SAQA5	SFP-SX
PIC 1		BUILTIN	BUILTIN	10x 1GE(LAN) SFP
Xcvr 0	REV 01	740-011613	P9F16KE	SFP-SX
Xcvr 1	REV 01	740-031851	AM1045SU91U	SFP-SX
Xcvr 4	REV 01	740-011613	PAJ4SY8	SFP-SX
Xcvr 5	REV 01	740-011782	P9228K7	SFP-SX
MIC 1	REV 27	750-028392	CABT5724	3D 20x 1GE(LAN) SFP
PIC 2		BUILTIN	BUILTIN	10x 1GE(LAN) SFP
Xcvr 0	REV 02	740-011613	AM0925SBG5T	SFP-SX
Xcvr 1		NON-JNPR	P7K1PUX	SFP-SX
Xcvr 2	REV 01	740-011613	PFF2DHH	SFP-SX
Xcvr 4	REV 01	740-011613	PD63DF2	SFP-SX
Xcvr 5	REV 02	740-011613	AM1033SH3DH	SFP-SX
Xcvr 6	REV 01	740-011613	PE70W8W	SFP-SX
Xcvr 9	REV 01	740-011613	PD62W9W	SFP-SX
PIC 3		BUILTIN	BUILTIN	10x 1GE(LAN) SFP
Xcvr 0	REV 02	740-013111	9154876	SFP-T
Xcvr 2	REV 01	740-011613	AM0846SAQ9H	SFP-SX
Xcvr 5	REV 01	740-011613	AM0820S9T2C	SFP-SX
Xcvr 9	REV 01	740-011613	AM0805S8LGQ	SFP-SX
FPC 7	REV 27	750-033205	ZL6014	MPCE Type 3 3D
CPU	REV 07	711-035209	ZK9068	HMPC PMB 2G
MIC 0	REV 04	750-028392	JR6231	3D 20x 1GE(LAN) SFP
PIC 0		BUILTIN	BUILTIN	10x 1GE(LAN) SFP
Xcvr 0	REV 01	740-031851	AM1045SU93A	SFP-SX
PIC 1		BUILTIN	BUILTIN	10x 1GE(LAN) SFP
Xcvr 4	REV 01	740-011782	P9P1050	SFP-SX
Xcvr 9	REV 01	740-011613	PFF2K74	SFP-SX
MIC 1	REV 19	750-033199	CAAF0016	1X100GE CFP
PIC 2		BUILTIN	BUILTIN	1X100GE CFP
FPC 11	REV 16	750-037358	CAAL1014	MPC4E 3D 32XGE
CPU	REV 08	711-035209	CAAS2637	HMPC PMB 2G
PIC 0				
PIC 1				
PIC 2				
PIC 3			FPC 12	REV 29 750-031090
ZA1887		MPC Type 2 3D EQ		
CPU	REV 06	711-030884	YR6876	MPC PMB 2G
FPC 13	REV 36	750-056519	CAFW4205	MPC7E 3D
MRATE-12xQSFP-XGE-XLGE-CGE				
CPU	REV 16	750-057177	CAFY5688	SMPC PMB
PIC 0		BUILTIN	BUILTIN	
MRATE-6xQSFP-XGE-XLGE-CGE				
Xcvr 0	REV 01	740-054053	QF3208FT	QSFP+-4X10G-SR
Xcvr 3	REV 01	740-032986	QB171000	QSFP+-40G-SR4
Xcvr 5	REV 01	740-058732	1CJQA10700C	QSFP-100GBASE-LR4
PIC 1		BUILTIN	BUILTIN	
MRATE-6xQSFP-XGE-XLGE-CGE				
Xcvr 0	REV 01	740-054053	QF3208G2	QSFP+-4X10G-SR

Xcvr 1	REV 01	740-054053	QF3208G3	QSFP+-4X10G-SR
Xcvr 2		NON-JNPR	F2M2010439	QSFP-100GBASE-LR4
Xcvr 3	REV 01	740-046565	QF3300ZQ	QSFP+-40G-SR4
Xcvr 5	REV 01	740-058734	1ACQ104202U	QSFP-100GBASE-SR4
FPC 14	REV 68	750-044130	ABDC2916	MPC6E 3D
CPU	REV 12	711-045719	ABDC2710	RMPC PMB
FPC 16	REV 22	750-037355	CABW1289	MPC4E 3D 2CGE+8XGE
CPU	REV 08	711-035209	CABR9796	HMPC PMB 2G
PIC 0		BUILTIN	BUILTIN	4x10GE SFPP
PIC 1		BUILTIN	BUILTIN	1X100GE CFP
PIC 2		BUILTIN	BUILTIN	4x10GE SFPP
PIC 3		BUILTIN	BUILTIN	1X100GE CFP
FPC 17	REV 23	750-037355	CACL2280	MPC4E 3D 2CGE+8XGE
CPU	REV 10	711-035209	CACK9073	HMPC PMB 2G
PIC 0		BUILTIN	BUILTIN	4x10GE SFPP
PIC 1		BUILTIN	BUILTIN	1X100GE CFP
PIC 2		BUILTIN	BUILTIN	4x10GE SFPP
PIC 3		BUILTIN	BUILTIN	1X100GE CFP
FPC 18	REV 23	750-054901	CAEV3700	MPC3E NG HQoS
CPU	REV 12	711-045719	CAFK4017	RMPC PMB
MIC 0	REV 19	750-033199	CAAJ9717	1X100GE CFP
PIC 0		BUILTIN	BUILTIN	1X100GE CFP
MIC 1	REV 15	750-033199	ZP6432	1X100GE CFP
PIC 2		BUILTIN	BUILTIN	1X100GE CFP
FPC 19	REV 29	750-063414	CAEJ2194	MPC9E 3D
CPU	REV 02	750-057177	CACN2561	SMPC PMB
MIC 0	REV 01	750-055992	CADV4595	
MRATE-12xQSFP-XGE-XLGE-CGE				
PIC 0		BUILTIN	BUILTIN	
MRATE-12xQSFP-XGE-XLGE-CGE				
Xcvr 0	REV 01	740-046565	QF3300ZG	QSFP+-40G-SR4
Xcvr 1	REV 01	740-046565	QF330122	QSFP+-40G-SR4
Xcvr 2	REV 01	740-046565	QF33011P	QSFP+-40G-SR4
Xcvr 3	REV 01	740-046565	QF3300ZU	QSFP+-40G-SR4
Xcvr 4	REV 01	740-046565	QF3300ZS	QSFP+-40G-SR4
Xcvr 5	REV 01	740-046565	QF3300ZN	QSFP+-40G-SR4
Xcvr 6	REV 01	740-046565	QF3300ZP	QSFP+-40G-SR4
Xcvr 7	REV 01	740-046565	QF3300ZT	QSFP+-40G-SR4
Xcvr 8	REV 01	740-046565	QF3300ZM	QSFP+-40G-SR4
Xcvr 9	REV 01	740-046565	QF3300ZR	QSFP+-40G-SR4
Xcvr 10	REV 01	740-046565	QF330105	QSFP+-40G-SR4
Xcvr 11	REV 01	740-046565	QF3300ZK	QSFP+-40G-SR4
MIC 1	REV 08	750-055992	CAEX1421	
MRATE-12xQSFP-XGE-XLGE-CGE				
PIC 1		BUILTIN	BUILTIN	
MRATE-12xQSFP-XGE-XLGE-CGE				
Xcvr 6	REV 01	740-046565	QF330100	QSFP+-40G-SR4
ADC 0	REV 19	750-043596	ABCK6658	Adapter Card
ADC 1	REV 17	750-043596	ABCB7201	Adapter Card
ADC 2	REV 05	750-043596	CAAC2076	Adapter Card
ADC 3	REV 13	750-043596	ABBX5549	Adapter Card
ADC 6	REV 17	750-043596	ABCB7226	Adapter Card
ADC 7	REV 01	750-043596	ZV4079	Adapter Card
ADC 11	REV 17	750-043596	ABCD5472	Adapter Card
ADC 12	REV 17	750-043596	ABCB7147	Adapter Card
ADC 13	REV 17	750-043596	ABCD5410	Adapter Card
ADC 16	REV 17	750-043596	ABCB7047	Adapter Card
ADC 17	REV 17	750-043596	ABCD5525	Adapter Card
ADC 18	REV 17	750-043596	ABCD5391	Adapter Card
Fan Tray 0	REV 01	760-042349	ACAY4801	FanTray v2

Fan Tray 1	REV 01	760-042349	ACAY4802	FanTray v2
Fan Tray 2	REV 01	760-042349	ACAY4803	FanTray v2
Fan Tray 3	REV 01	760-042349	ACAY4800	FanTray v2

- To verify that all the fabric planes are available and operational, issue the following command:

```
user@host> show chassis fabric plane
```

```
Fabric management PLANE state
```

```
Plane 0
```

```
Plane state: ACTIVE
```

```
FPC 0
```

```
PFE 0 :Links ok
```

```
FPC 1
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
PFE 2 :Links ok
```

```
PFE 3 :Links ok
```

```
FPC 2
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
FPC 3
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
FPC 6
```

```
PFE 0 :Links ok
```

```
FPC 7
```

```
PFE 0 :Links ok
```

```
FPC 11
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
FPC 12
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
FPC 13
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
FPC 14
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
PFE 2 :Links ok
```

```
PFE 3 :Links ok
```

```
FPC 16
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
FPC 17
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
FPC 18
```

```
PFE 0 :Links ok
```

```
FPC 19
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
PFE 2 :Links ok
```

```
PFE 3 :Links ok
```

```
Plane 1
```

```
Plane state: ACTIVE
```

```
FPC 0
```

```
    PFE 0 :Links ok
FPC 1
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 2
    PFE 0 :Links ok
    PFE 1 :Links ok
FPC 3
    PFE 0 :Links ok
    PFE 1 :Links ok
FPC 6
    PFE 0 :Links ok
FPC 7
    PFE 0 :Links ok
FPC 11
    PFE 0 :Links ok
    PFE 1 :Links ok
FPC 12
    PFE 0 :Links ok
    PFE 1 :Links ok
FPC 13
    PFE 0 :Links ok
    PFE 1 :Links ok
FPC 14
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 16
    PFE 0 :Links ok
    PFE 1 :Links ok
FPC 17
    PFE 0 :Links ok
    PFE 1 :Links ok
FPC 18
    PFE 0 :Links ok
FPC 19
    PFE 0 :Links ok
PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
...
Plane 7
Plane state: ACTIVE
FPC 0
    PFE 0 :Links ok
FPC 1
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 2
    PFE 0 :Links ok
    PFE 1 :Links ok
FPC 3
    PFE 0 :Links ok
    PFE 1 :Links ok
```

```
FPC 6
  PFE 0 :Links ok
FPC 7
  PFE 0 :Links ok
FPC 11
  PFE 0 :Links ok
  PFE 1 :Links ok
FPC 12
  PFE 0 :Links ok
  PFE 1 :Links ok
FPC 13
  PFE 0 :Links ok
  PFE 1 :Links ok
FPC 14
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 16
  PFE 0 :Links ok
  PFE 1 :Links ok
FPC 17
  PFE 0 :Links ok
  PFE 1 :Links ok
FPC 18
  PFE 0 :Links ok
FPC 19
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
```

3. To verify that the state of the electrical switch fabric links between the Flexible PIC Concentrators (FPCs) and the Switch Fabric Boards (SFBs) are eligible for carrying traffic, issue the following command:

```
user@host>show chassis fabric fpcs
```

```
Fabric management FPC state:
```

```
FPC 0
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
FPC 1
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
```



```
PFE #1
  Plane 0: Plane enabled
  Plane 1: Plane enabled
  Plane 2: Plane enabled
  Plane 3: Plane enabled
  Plane 4: Plane enabled
  Plane 5: Plane enabled
  Plane 6: Plane enabled
  Plane 7: Plane enabled
PFE #2
  Plane 0: Plane enabled
  Plane 1: Plane enabled
  Plane 2: Plane enabled
  Plane 3: Plane enabled
  Plane 4: Plane enabled
  Plane 5: Plane enabled
  Plane 6: Plane enabled
  Plane 7: Plane enabled
PFE #3
  Plane 0: Plane enabled
  Plane 1: Plane enabled
  Plane 2: Plane enabled
  Plane 3: Plane enabled
  Plane 4: Plane enabled
  Plane 5: Plane enabled
  Plane 6: Plane enabled
  Plane 7: Plane enabled
FPC 2
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
...
FPC 19
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
```

```

Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #2
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #3
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled

```

4. To verify the state of all fabric planes and the elapsed time, issue the following command:

```
user@host> show chassis fabric summary
```

Plane	State	Uptime
0	Online	11 hours, 13 minutes, 27 seconds
1	Online	11 hours, 13 minutes, 6 seconds
2	Online	11 hours, 12 minutes, 45 seconds
3	Online	11 hours, 12 minutes, 24 seconds
4	Online	11 hours, 12 minutes, 2 seconds
5	Online	11 hours, 11 minutes, 41 seconds
6	Online	11 hours, 11 minutes, 20 seconds
7	Online	11 hours, 10 minutes, 59 seconds

Note: For extended summary, use  
show chassis fabric summary extended

- Related Documentation**
- [Understanding the Smooth Upgrade Process on page 150](#)
  - [Performing a Smooth Upgrade to Enhanced Switch Fabric Board \(SFB2\) with Minimal Impact on Traffic on page 160](#)

## Performing a Smooth Upgrade to Enhanced Switch Fabric Board (SFB2) with Minimal Impact on Traffic

This example shows how to perform a smooth upgrade from the Switch Fabric Board (SFB) to the enhanced Switch Fabric Board (SFB2) on the MX2000 line of routers. A smooth upgrade helps reduce network downtime because of 7+1 fabric redundancy.

When one SFB is being upgraded to SFB2, the other 7 SFBs are available to handle the traffic.



**NOTE:** On MX2010 and MX2020 routers, if you have installed the Junos Continuity software package or if the router is not configured to allow multiple versions of the SFBs to coexist, you cannot perform a smooth upgrade from SFB to SFB2.

When not using a smooth upgrade, use one of the following methods to upgrade to SFB2:

- Power off the router, replace the SFB with SFB2, and then power on the router.
- Take both the Routing Engines offline, replace the SFB with SFB2, and then bring both the Routing Engines online.

- [Requirements on page 161](#)
- [Overview on page 161](#)
- [Configuration on page 162](#)
- [Verification on page 164](#)

## Requirements

This example uses the following hardware and software components:

- MX2020 router with dual Routing Engines
- 8 Switch Fabric Boards (SFBs)
- 8 enhanced Switch Fabric Boards (SFB2s)
- Junos OS Release 16.1R1 or later release

Before you begin the smooth upgrade, ensure that you:

- Prepare the router and install the version of Junos OS Release that supports the enhanced Switch Fabric Board (SFB2).
- Verify that the existing SFBs are online and operational and also check the status of the fabric planes.

For more information about what you must do before you commence smooth upgrade, see [“Before you Begin the Smooth Upgrade Process” on page 151](#).

## Overview

The smooth upgrade process is used to upgrade from Switch Fabric Board (SFB) to enhanced Switch Fabric Board (SFB2) with minimal traffic impact. The existing SFBs are replaced one by one, in any order, by the new SFB2s. Because you are replacing a single SFB at a time, the remaining SFBs handle the traffic and so there is minimal impact to traffic. SFB2 is supported only on MX2020 and MX2010 routers.

## Topology

---

This example shows how to perform a smooth upgrade on an MX2020 router that has eight SFBs. The 8 SFBs are replaced with 8 enhanced switch fabric boards (SFB2). First, initiate the smooth upgrade process and then take a single SFB offline. Replace the SFB with an SFB2, and then bring the SFB2 online. You can then repeat the steps for the other seven SFBs.

After you upgrade all the SFBs to SFB2s, the fabric bandwidth per slot of MPC8E and MPC9E on the MX2020 router is increased from 11 Gbps to 25 Gbps. However, the upgrade does not impact the fabric bandwidth per slot of MPC7.

## Configuration

To upgrade from SFB to SFB2, perform the following tasks:

- [Initiating the Smooth Upgrade Process on page 162](#)
- [Performing the Smooth Upgrade on page 163](#)
- [Terminating the Smooth Upgrade Process on page 164](#)

### Initiating the Smooth Upgrade Process

---

#### Step-by-Step Procedure

By default, the MX2000 line of routers do not support both SFB and SFB2 at the same time. However, when you initiate the smooth upgrade process, the router can support both SFB and SFB2 at the same time. So, before you replace an SFB with an SFB2, you must initiate the smooth upgrade process.

1. In configuration mode, at the **[edit]** hierarchy level, Initiate the smooth upgrade process for the SFBs.

```
[edit]
user@host# set chassis state sfb-upgrade on
```

2. Commit the changes by using the **commit** statement and exit the configuration mode.

```
[edit]
user@host# commit
```

3. In operational mode, verify that you have initiated the smooth upgrade process.

```
user@host> show configuration chassis
state {
  sfb-upgrade on;
}
```

## Performing the Smooth Upgrade

### Step-by-Step Procedure

1. In operational mode, take the SFBs offline. There is no specific order that needs to be maintained. In this example, you start with the SFB in slot 7 first.

```
user@host> request chassis sfb slot 7 offline
```

2. Verify that the SFB is offline.

```
user@host> show chassis sfb
```

Slot	State	Uptime
0	Online	1 day, 12 hours, 6 minutes, 59 seconds
1	Online	1 day, 12 hours, 6 minutes, 37 seconds
2	Online	1 day, 12 hours, 6 minutes, 16 seconds
3	Online	1 day, 12 hours, 5 minutes, 55 seconds
4	Online	1 day, 12 hours, 5 minutes, 33 seconds
5	Online	1 day, 12 hours, 5 minutes, 12 seconds
6	Online	1 day, 12 hours, 4 minutes, 51 seconds
7	Offline	--- Offlined by cli command ---

3. Replace the SFB that is offline with the enhanced SFB (SFB2). Minimal traffic loss is expected as only a single SFB is replaced and other seven SFBs are operational and handle the traffic.

4. In operational mode, bring the SFB2 online.

```
user@host> request chassis sfb slot 7 online
```

5. Verify that the SFB2 is online.

```
user@host> show chassis sfb
```

Slot	State	Uptime
0	Online	1 day, 12 hours, 16 minutes, 38 seconds
1	Online	1 day, 12 hours, 16 minutes, 16 seconds
2	Online	1 day, 12 hours, 15 minutes, 55 seconds
3	Online	1 day, 12 hours, 15 minutes, 34 seconds
4	Online	1 day, 12 hours, 15 minutes, 12 seconds
5	Online	1 day, 12 hours, 14 minutes, 51 seconds
6	Online	1 day, 12 hours, 14 minutes, 30 seconds
7	Online	38 seconds

6. Repeat Step 3 through Step 5 for upgrading the other SFBs. We recommend that you upgrade fabric boards one at a time for minimal traffic impact.

## Terminating the Smooth Upgrade Process

---

### Step-by-Step Procedure

After all the SFBs are upgraded to the enhanced SFB (SFB2), you can terminate the smooth upgrade process. When the smooth upgrade process is initiated, SFB and SFB2 can coexist on the same router. When you terminate the smooth upgrade process, the router can have only SFB or SFB2 and not both at the same time.

1. In configuration mode, at the **[edit]** hierarchy level, terminate the smooth upgrade process.



**NOTE:** You can also use the `delete chassis state sfb-upgrade` command to terminate the smooth upgrade process.

```
[edit]
user@host# set chassis state sfb-upgrade off
```

2. Commit the changes by using the **commit** statement and exit configuration mode.

```
[edit]
user@host# commit
```

3. In operational mode, verify that you have initiated the smooth upgrade process.

```
user@host> show configuration chassis
state {
  sfb-upgrade off;
}
```

## Verification

To confirm that you have upgraded SFB to SFB2 on the MX2020 router, perform these tasks:

- [Verifying That the Switch Fabric Board \(SFB\) is Offline on page 164](#)
- [Verifying That the Enhanced Switch Fabric Board \(SFB2\) is Online on page 167](#)

### Verifying That the Switch Fabric Board (SFB) is Offline

---

**Purpose** To verify that the SFB on a particular slot, for instance slot 1, is offline.

**Action** From operational mode, enter the **show chassis fabric fpcs** command.

```
user@host> show chassis fabric fpcs
```

```
Fabric management FPC state:
```

```
FPC 2
```

```
PFE #0
```

```
Plane 0: Plane enabled
Plane 1: Plane disabled >>>>>
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
```

```
FPC 4
```

```
PFE #0
```

```
Plane 0: Plane enabled
Plane 1: Plane disabled >>>>>>
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
```

```
PFE #1
```

```
Plane 0: Plane enabled
Plane 1: Plane disabled >>>>
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
```

```
PFE #2
```

```
Plane 0: Plane enabled
Plane 1: Plane disabled >>>>
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
```

```
PFE #3
```

```
Plane 0: Plane enabled
Plane 1: Plane disabled >>>>>
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
```

```
FPC 6
```

```
PFE #0
```

```
Plane 0: Plane enabled
Plane 1: Plane disabled >>>>>
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
```

```

    Plane 6: Plane enabled
    Plane 7: Plane enabled
PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane disabled  >>>>>
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
FPC 7
PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane disabled  >>>>>
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane disabled  >>>>>
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
PFE #2
    Plane 0: Plane enabled
    Plane 1: Plane disabled  >>>>>
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
PFE #3
    Plane 0: Plane enabled
    Plane 1: Plane disabled  >>>>>>
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled

```

From operational mode, enter the **show chassis fabric summary** command.

```
user@host> show chassis fabric summary
```

Plane	State	Uptime
0	Online	3 minutes, 14 seconds
1	Offline	
2	Online	1 hour, 56 minutes, 53 seconds
3	Online	1 hour, 56 minutes, 39 seconds



```
4      Online  1 hour, 56 minutes, 25 seconds
5      Online  1 hour, 56 minutes, 11 seconds
6      Online  1 hour, 55 minutes, 56 seconds
7      Online  1 hour, 42 minutes, 28 seconds
```

Note: For extended summary, use  
show chassis fabric summary extended

**Meaning** The SFB in Slot 1 has been taken offline.

### Verifying That the Enhanced Switch Fabric Board (SFB2) is Online

**Purpose** To verify that the enhanced switch fabric board (SFB2) inserted in the same slot (slot 1) is online.

**Action** From operational mode, enter the **show chassis fabric fpcs** command.

```
user@host> show chassis fabric fpcs
```

```
Fabric management FPC state:
```

```
FPC 2
```

```
PFE #0
```

```
Plane 0: Plane enabled
Plane 1: Plane enabled >>>>>
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
```

```
FPC 4
```

```
PFE #0
```

```
Plane 0: Plane enabled
Plane 1: Plane enabled >>>>>
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
```

```
PFE #1
```

```
Plane 0: Plane enabled
Plane 1: Plane enabled >>>>
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
```

```
PFE #2
```

```
Plane 0: Plane enabled
Plane 1: Plane enabled >>>>
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
```

```
PFE #3
```

```
Plane 0: Plane enabled
Plane 1: Plane enabled >>>>>
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
```

```
FPC 6
```

```
PFE #0
```

```
Plane 0: Plane enabled
Plane 1: Plane enabled >>>>>
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
```

```

Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled >>>>>
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
FPC 7
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled >>>>>
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled >>>>>
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #2
Plane 0: Plane enabled
Plane 1: Plane enabled >>>>>
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #3
Plane 0: Plane enabled
Plane 1: Plane enabled >>>>>>
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled

```

From operational mode, enter the **show chassis fabric summary** command.

```
user@host> show chassis fabric summary
```

```

Plane  State      Uptime
0       Online    6 minutes, 38 seconds
1       Online    2 minutes, 12 seconds >>>>
2       Online    2 hours, 17 seconds
3       Online    2 hours, 3 seconds

```

4	Online	1 hour, 59 minutes, 49 seconds
5	Online	1 hour, 59 minutes, 35 seconds
6	Online	1 hour, 59 minutes, 20 seconds
7	Online	1 hour, 45 minutes, 52 seconds

**Meaning** The SFB2 that replaced the SFB on slot 1 is online and operational.

**Related Documentation**

- [Understanding the Smooth Upgrade Process on page 150](#)
- [Before you Begin the Smooth Upgrade Process on page 151](#)

## Understanding Fabric Fault Handling on Enhanced Switch Fabric Board (SFB2)

The MX2000 line of routers support Switch Fabric Boards (SFBs) and enhanced SFBs (SFB2s) but not both at the same time. The SFB and SFB2 host three fabric planes each. So, the chassis supports a total of 24 planes. Junos OS Release 15.1F6 and 16.1R1 support fabric fault handling for each plane in both SFB and SFB2. In earlier releases, fabric fault handling is supported for each SFB, not for each plane.

[Table 24 on page 170](#) lists the differences between fabric fault handling per plane and per SFB.

*Table 24: SFB Versus SFB2 Fabric Fault Handling*

SFB Level (SFB)	Plane Level (SFB and SFB2)
Cyclic redundancy check(CRC) errors on any link on the SFB are indicated on the SFB.	CRC errors on any link on the SFB or SFB2 are indicated on the plane.
On encountering destination errors, the line card isolates the SFB (all 3 planes).	On encountering destination errors, the line card isolates the corresponding plane. Other planes continue to operate.

Fabric fault handling per-plane provides the following benefits:

- Increased granularity, which helps identify, isolate, and repair faults.
- Alarms and log messages provide fault information per plane instead of per SFB, which makes debugging easier.
- If an SFB has a single faulty plane, the other two planes can continue to operate. There is no need to take the entire SFB offline.
- In case of transient errors, while repairing you can isolate a single plane instead of isolating the bouncing the SFB.

To view fabric fault handling information for all 24 planes, use the **extended** option with the existing fabric commands.

- Related Documentation
- [show chassis fabric destinations on page 1372](#)
  - [show chassis fabric fpcs on page 1412](#)
  - [show chassis fabric plane on page 1487](#)
  - [show chassis fabric plane-location on page 1542](#)
  - [show chassis fabric reachability on page 1554](#)
  - [show chassis fabric summary on page 1576](#)

## Fabric Management on MPC7E Overview

The two variants of MPC7E—MPC7E-MRATE and MPC7E 10G—provide scalability in bandwidth and services capability of routers. The two MPCs are supported on MX240, MX480, and MX960 routers. The MPCs plug into the chassis and provide the fabric interface.



**NOTE:** The MPC7E-MRATE and MPC7E-10G MPCs are supported only on MX-SCBE2.

An MX960 router can support three Enhanced Switch Control Boards (SCBE2s)—two planes on each SCB and make up a total of six fabric planes. MX240 and MX480 routers can support up to two SCBE2—four fabric planes on each SCBE2 make up a total of eight planes. However, the MX240 and MX480 routers have only six active planes. The remaining two are redundant.

By default, MX240, MX480, and MX960 routers support four active fabric planes each. However, this default fabric redundancy mode, also known as *redundant fabric mode*, makes the MPC run in reduced bandwidth state. In *increased bandwidth mode*, the MX240, MX480, and MX960 routers support six active fabric planes each. You can increase the number of active fabric planes by changing the mode from *redundant fabric mode* to *increased bandwidth mode*. To configure the MPC7E to function in increased bandwidth mode, use the existing **redundancy-mode increased-bandwidth** statement at the **[edit chassis fabric]** hierarchy level. An MPC working with reduced fabric bandwidth can affect the routing process, resulting in reduced throughput. You can enable increased fabric bandwidth of the active SCBE2 for optimal and efficient performance and traffic handling.

On MX240 and MX480 routers, if the fabric redundancy mode is not configured, then fabric planes 0, 1, 2, and 3 are online and active and fabric planes 4, 5, 6, and 7 are redundant. If you configure the increased bandwidth mode, then the fabric planes 0, 1, 2, 3, 4, and 6 are active and fabric planes 5 and 7 are redundant.

On MX960 routers with MPC7E, if you configure increased bandwidth mode, then fabric planes 0, 1, 2, 3, 4, and 5 are active.

The following sections describe the fabric management features supported on the MPC7E MPCs in MX240, MX480, and MX960 routers.

- [Fabric Hardening on page 172](#)
- [Limiting Traffic Disruption by Detecting Packet Forwarding Engine Destinations That Are Unreachable over the Fabric on page 172](#)

## Fabric Hardening

Fabric hardening is the process of controlling bandwidth degradation to prevent traffic black hole. Fabric hardening can be configured with two CLI configuration statements, **per fpc bandwidth-degradation** and **per fpc blackhole-action**. The two statements give you more control over what threshold of bandwidth degradation to react to, and what corrective action to take. The **per fpc bandwidth-degradation** statement determines how the MPC reacts when it reaches a specified bandwidth degradation percentage. The **per fpc blackhole-action** statement determines how the MPC responds to a 100 percent fabric degradation scenario. This statement is optional and overrides the default fabric hardening procedures.

## Limiting Traffic Disruption by Detecting Packet Forwarding Engine Destinations That Are Unreachable over the Fabric

The router is able to detect unreachable destination Packet Forwarding Engines and limit the time for which traffic is disrupted. The router signals neighboring routers when it cannot carry traffic because of the inability of some or all source Packet Forwarding Engines to forward traffic to some or all destination Packet Forwarding Engines on any fabric plane, after interfaces have been created. This inability to forward traffic results in a traffic disruption by the router. When the router detects unreachable Packet Forwarding Engine destinations, it attempts to recover from the condition causing the disruption. If the recovery attempt fails, the system turns off the interfaces, thereby ending the disruption and initiating the recovery process.

The recovery process consists of the following steps:

1. Fabric plane restart phase: The MPC restarts the fabric planes one by one.
2. Fabric plane and MPC restart phase: The router restarts both the fabric planes and the MPCs. If there are unreachable MPCs that are unable to initiate high-speed links to the fabric after reboot, traffic disruption is limited because no interfaces are created for these MPCs.
3. MPC offline phase: When previous attempts at recovery fail, the router makes the MPCs that contribute to the traffic black-hole condition offline and turns off the interfaces.

### Related Documentation

- [redundancy-mode on page 761](#)
- [bandwidth-degradation on page 608](#)
- [offline-on-fabric-bandwidth-reduction on page 723](#)
- [blackhole-action on page 609](#)

- [Detection and Recovery of Fabric-Related Failures Caused by Loss of Connectivity on MX Series Routers on page 135](#)
- [Managing Bandwidth Degradation on page 143](#)





## CHAPTER 6

# Configuring Rate Selectability

- [Understanding Rate Selectability on page 176](#)
- [Guidelines for Configuring Rate Selectability on page 179](#)
- [Understanding Interface Naming Convention for MPC7E-MRATE on page 180](#)
- [Understanding Interface Naming Conventions for MIC-MRATE on page 182](#)
- [Understanding Interface Naming Conventions for MX10003 MPC on page 185](#)
- [Understanding Interface Naming Conventions for JNP10K-LC2101 on page 187](#)
- [Supported Active Physical Ports for Configuring Rate Selectability to Prevent Oversubscription on page 189](#)
- [Supported Active Physical Ports for Configuring Rate Selectability to Prevent Oversubscription on MX10003 MPC on page 192](#)
- [Supported Active Physical Rate-Selectable Ports to Prevent Oversubscription on MX204 Router on page 193](#)
- [Configuring Rate Selectability on MIC-MRATE to Enable Different Port Speeds on page 196](#)
- [Configuring Rate Selectability on MPC7E \(Multi-Rate\) to Enable Different Port Speeds on page 201](#)
- [MX10003 MPC Rate-Selectability Overview on page 205](#)
- [MX204 Router Rate-Selectability Overview on page 210](#)
- [Configuring Rate Selectability on MX10003 MPC to Enable Different Port Speeds on page 216](#)
- [Configuring Rate Selectability on MX204 to Enable Different Port Speeds on page 220](#)
- [Configuring Rate Selectability on JNP10K-2101 MPC to Enable Different Port Speeds on page 223](#)

## Understanding Rate Selectability

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The maximum amount of data that can be transmitted through a port at any given second either by a network device or by a component of the network device (such as a line card) is known as the port speed. Port speed is measured in kilobits per second (Kbps), gigabits per second (Gbps), and terabits per second (Tbps). If a port can be configured to support both single and multiple speeds, the port is known as a *rate-selectable* port. Because the port is part of a network device (router or switch) or a network component (such as MPC, MIC) the component is known as a rate-selectable component. For instance, if a Modular Port Concentrator (MPC) supports multiple speeds, it is known as a rate-selectable MPC. If a Modular Interface Card (MIC) supports multiple speeds, it is known as a rate-selectable MIC. The term *multi-rate* in the name of a component also indicates support for more than one speed.

Rate selectability enables you to configure the port speed either at the port level or at the PIC or MIC level. To configure all ports to operate at the same speed, you configure rate selectability at the MIC or PIC level. To configure different port speeds for each port, you configure rate selectability at the port level, in which case only the ports that are configured are enabled.

When you configure rate selectability at the MIC or PIC level, all the ports of the MIC or PIC that support the configured speed operate at that speed. To prevent switch fabric interface oversubscription—for example, with the Switch Fabric Board SFB or SFB2—and to ensure a guaranteed bandwidth, you can specify the number of active ports that operate at the configured speed. For instance, on a router with SFB, if you want only eight ports of the MIC to operate at 40 Gbps, you can configure the MIC to operate at 40 Gbps and enable the eight ports that you want to operate at that speed. The remaining ports of the MIC are automatically disabled. For example, on MPC8E with MIC-MRATE, you can configure four 100-Gigabit Ethernet interfaces and two 40-Gigabit Ethernet interfaces per MIC. All other interfaces are automatically disabled. Configuring rate selectability at the MIC level helps you configure the operating speed of the MIC easily.



**NOTE:** The total port speed of the MIC cannot exceed the forwarding capacity of the Packet Forwarding Engine.

---

Configuring rate selectability at the port level provides you the flexibility of operating the ports of the MIC at different supported speeds. For example, you can configure four 10-Gigabit Ethernet interfaces on port 0, one 40-Gigabit Ethernet interface on port 1, and one 100-Gigabit Ethernet interface on port 2.



**NOTE:** When you configure rate selectability at the port level, ensure that you plug in transceivers to the ports according to the speeds that you configure. For instance, use 4x duplex LC breakout transceivers to configure 10-Gigabit Ethernet interfaces, fiber-optic 40-gigabit QSFP+ transceivers to configure 40-Gigabit Ethernet interfaces, and fiber-optic 100-gigabit QSFP28 transceivers to configure 100-Gigabit Ethernet interfaces.

---

## Rate Selectability on MPC7E-MRATE

MPC7E (MPC7E-MRATE) is a fixed-configuration MPC and is supported on MX240, MX480, MX960, MX2010, and MX2020 routers. MPC7E-MRATE contains two built-in PICs, PIC 0 and PIC 1. Each PIC has six physical ports that support quad small form-factor pluggable plus (QSFP+) transceivers. The default port speed is 10 Gbps for all ports. Each of the six ports of PIC 0 and PIC 1 supports speeds of 10 Gbps and 40 Gbps. However, only ports 2 and 5 on both the PICs support 100 Gbps speed.

MPC7E-MRATE has an aggregate forwarding capacity of 480 Gbps and a forwarding capacity of 240 Gbps on each Packet Forwarding Engine. Oversubscription of Packet Forwarding Engine capacity is not supported. The demand on each Packet Forwarding Engine must be less than or equal to its forwarding capacity. For instance, for MPC7E-MRATE, the demand on each Packet Forwarding Engine must be less than or equal to 240 Gbps.

For information about the naming conventions for interfaces on MPC7E-MRATE MPC, see [“Understanding Interface Naming Convention for MPC7E-MRATE” on page 180](#).

## Rate Selectability on MIC-MRATE

MPC8E (MX2K-MPC8E) and MPC9E (MX2K-MPC9E) support two separate slots for MICs as field replaceable units (FRUs). Each of the MIC slots supports only one MIC—MIC-MRATE. MIC-MRATE consists of 12 physical ports that support QSFP+ transceivers and multiple port speeds of 100 Gbps, 40 Gbps, and 10 Gbps. You can configure a port to operate in a specific speed based on your requirement. The default port speed is 10 Gbps for all ports. MIC-MRATE also supports breakout transceivers, which you can use to split a 40-Gigabit Ethernet port into four 10-Gigabit Ethernet ports. MIC-MRATE ports can be split into a maximum of 48 10-Gigabit Ethernet interfaces.

MPC8E has an aggregate forwarding capacity of 960 Gbps and a forwarding capacity of 240 Gbps on each Packet Forwarding Engine. MPC9E has an aggregate forwarding capacity of 1600 Gbps and a forwarding capacity of 400 Gbps on each Packet Forwarding Engine. Oversubscription of Packet Forwarding Engine capacity is not supported. The demand on each Packet Forwarding Engine must be less than or equal to its forwarding capacity. For instance, for MPC8E, the demand on each Packet Forwarding Engine must be less than or equal to 240 Gbps and for MPC9E, the demand per Packet Forwarding Engine must be less than or equal to 400 Gbps.

On MPC8E with MIC-MRATE, you can configure four 100-Gigabit Ethernet interfaces and two 40-Gigabit Ethernet interfaces per MIC. All other interfaces are automatically disabled. On MPC9E with MIC-MRATE, you can configure eight ports as 100-Gigabit Ethernet interfaces and the other ports can be configured only as 40-Gigabit Ethernet interfaces or 10-Gigabit Ethernet interfaces.

For information about the naming conventions for interfaces on MPC8E and MPC9E, see [“Understanding Interface Naming Conventions for MIC-MRATE” on page 182](#).

## Rate Selectability on JNP10K-LC2101

JNP10K-LC2101 is a fixed-configuration MPC and is supported on MX10008 routers. JNP10K-LC2101 contains six built-in PICs, PIC 0 to PIC 5. Each PIC has four physical ports that support quad small form-factor pluggable plus (QSFP+) transceivers. The default port speed is 10 Gbps for all ports. Each of the four ports of PIC 0 to PIC 5 supports speeds of 10 Gbps (using breakout cables), 40 Gbps, and 100 Gbps.

MX10008 routers support eight JNP10K-LC2101 MPCs. By default, each JNP10K-LC2101 MPC provides a maximum bandwidth of 1.44 Tbps. JNP10K-LC2101 has six Packet Forwarding Engines, each providing a maximum bandwidth of up to 240 Gbps, which cannot be oversubscribed. You can configure JNP10K-LC2101 to provide an increased bandwidth of 2.4 Tbps. The demand on each Packet Forwarding Engine must be less than or equal to its forwarding capacity. For instance, by default, for JNP10K-LC2101, the demand on each Packet Forwarding Engine must be less than or equal to 240 Gbps. However, if you have configured JNP10K-LC2101 to provide an increased bandwidth of 2.4 Tbps, the demand on each Packet Forwarding Engine must be less than or equal to 480 Gbps.

For information about the naming conventions for interfaces on JNP10K-LC2101 MPC, see [“Understanding Interface Naming Conventions for JNP10K-LC2101” on page 187](#).

## Rate Selectability on MIC-MACSEC-20GE

The MIC-MACSEC-20GE MIC provides 128-bit and 256-bit MACsec encryption on all the twenty 1GE and on the two 10GE ports in the following hardware configuration:

- Installed directly on the MX80 and MX104 routers
- Installed on MPC1, MPC2, MPC3, MPC2E, MPC3E, MPC2E-NG, and MPC3E-NG line cards on the MX240, MX480, and MX960 routers

By default, 128-bit MACsec encryption is supported.

The twenty 1-Gigabit Ethernet SFP ports distributes the ports across PIC0 and PIC1, that are logical PICs on the physical MIC. The two 10-Gigabit Ethernet SFP+ ports are physically located on PIC1. But, the 10-Gigabit interfaces are created by distributing the ports in either of the PICs. For information about the naming conventions for interfaces on MIC-MACSEC-20GE, see [“Understanding Interface Naming Conventions for MIC-MACSEC-20GE” on page 22](#).



### NOTE:

- When the pic-mode is changed from 1-Gbps to 10-Gbps or vice versa, the Flexible PIC Concentrator (FPC) in MX240, MX480, MX960 routers and the Forwarding Engine Board (FEB) in MX80, MX104 routers undergoes an automatic bounce or reboot.
  - When the MIC-MACSEC-20GE is operating in the 10-Gbps mode, all the other 1-Gbps ports are disabled.
-

- Related Documentation**
- [Configuring Rate Selectability on MPC7E \(Multi-Rate\) to Enable Different Port Speeds on page 201](#)
  - [Configuring Rate Selectability on MIC-MRATE to Enable Different Port Speeds on page 196](#)
  - [Guidelines for Configuring Rate Selectability on page 179](#)
  - *Junos Continuity Software User Guide (Junos OS Release 14.1R4 and Later Releases)*
  - [Supported Active Physical Ports for Configuring Rate Selectability to Prevent Oversubscription on page 189](#)
  - [Understanding Interface Naming Conventions for MIC-MRATE on page 182](#)
  - [Understanding Rate Selectability on page 176](#)

## Guidelines for Configuring Rate Selectability

This topic describes the guidelines to consider when configuring rate selectability at the port level or the PIC or MIC level.

- If rate selectability is not configured, all ports of the MIC-MRATE MIC and MPC7E-MRATE MPC operate as four 10-Gigabit Ethernet interfaces by default. Therefore, when booting the MPC:
  - If rate selectability is not configured or if invalid port speeds are configured, an alarm is generated to indicate that the configuration is invalid. All the ports operate as four 10-Gigabit Ethernet interfaces.
  - If valid port speeds are configured, the PIC and MIC operate at the configured speed.
- When you change an existing port speed configuration at the port level, you must reset the MPC7E-MRATE PIC for the configuration to take effect.

Similarly, when you change an existing port speed configuration at the port level for MPC8E or MPC9E, you must reset the MIC for the configuration to take effect. You can use the **request chassis mic mic-slot mic-slot-number fpc-slot fpc-slot-number (offline | online)** command to reset the MIC and apply your configuration changes.

An alarm is generated indicating the change in port speed configuration.

- When you change an existing port speed configuration with an *invalid* port speed configuration, an alarm is generated indicating that the port speed configuration is invalid. For example, on the MPC7E-MRATE, if you configure the port speed of port 3 as 100 Gbps, it is an invalid configuration. MPC7E -MRATE supports 100 Gbps only on ports 2 and 5. The MPC continues to operate using the existing port speed configuration or the default port speed.
- You cannot configure rate selectability at the PIC level and the port level simultaneously. Error messages are displayed when you try to commit such configurations.
- When you configure rate selectability at the port level, only the configured ports are enabled. Other ports are disabled.

## Guidelines for Configuring Rate Selectability for JNP10K-LC2101

This topic describes the guidelines to consider when configuring rate selectability at the port level or the PIC level for JNP10K-LC2101:

- Each port on the JNP10K-LC2101 MPC supports speeds of 10 Gbps (using breakout cables), 40 Gbps, and 100 Gbps. However, JNP10K-LC2101 MPC does not support bandwidth oversubscription. So, when you configure the ports on all PICs, ensure that the demand on each Packet Forwarding Engine is less than or equal to its forwarding capacity. The default port speed for all PICs is 10G.
- When you change an existing port speed configuration at the port level, you must reset the PIC for the configuration to take effect. When you change an existing port speed configuration at the PIC level, the JNP10K-LC2101 automatically resets the PIC.
- When you change the number of active ports using the **number-of-ports** command, you must reset the PIC for the configuration to take effect. Interfaces are created only for active ports. Only the ports you configure are known as the active ports. The number of active ports enables you to handle bandwidth oversubscription.



**NOTE:** You cannot configure the number of active ports at the port level. If you attempt to configure the number of active ports at the port level, an error message is displayed.

- You cannot configure rate selectability at the PIC level and the port level simultaneously. Error messages are displayed when you try to commit such configurations.
- When you change an existing port speed configuration with an *invalid* port speed configuration, an alarm is generated indicating that the port speed configuration is invalid. The MPC continues to operate using the existing port speed configuration or the default port speed.

### Related Documentation

- [Configuring Rate Selectability on MPC7E \(Multi-Rate\) to Enable Different Port Speeds on page 201](#)
- [Configuring Rate Selectability on MIC-MRATE to Enable Different Port Speeds on page 196](#)
- [Understanding Rate Selectability on page 176](#)

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## Understanding Interface Naming Convention for MPC7E-MRATE

MPC7E (MPC7E-MRATE) is a fixed-configuration MPC and contains two built-in PICs, PIC 0 and PIC 1. Each of the six ports of PIC 0 and PIC 1 support multiple port speeds of 100 Gbps, 40 Gbps, and 10 Gbps and can be configured as 10-Gigabit Ethernet and 40-Gigabit Ethernet interfaces. However, you can configure only ports 2 and 5 on both the PICs as 100-Gigabit Ethernet interfaces.

MPC7E-MRATE has an aggregate forwarding capacity of 480 Gbps and a forwarding capacity of 240 Gbps on each Packet Forwarding Engine. Oversubscription of Packet Forwarding Engine capacity is not supported. The demand on each Packet Forwarding Engine must be less than or equal to its forwarding capacity. For instance, for MPC7E-MRATE, the demand on each Packet Forwarding Engine must be less than or equal to 240 Gbps.

The 40-Gigabit Ethernet and 100-Gigabit Ethernet interfaces configured on the MPC7E-MRATE MPC follow the naming convention **et-fpc-slot/pic-slot/port-number**. The 10-Gigabit Ethernet interfaces configured on the MPC7E-MRATE MPC follow the naming convention **xe-fpc-slot/pic-slot/port-number:[logical-port-number]**.

For example, **et-0/0/2** indicates either a 40-Gigabit Ethernet or a 100-Gigabit Ethernet interface configured on port 2 of PIC 0 of the MPC7E-MRATE MPC that is installed in the MPC slot 0. **xe-0/0/1:3** indicates a 10-Gigabit Ethernet interface configured on logical port 3 of physical port 1 of the MPC7E-MRATE MPC that is installed in the MPC slot 0.

Table 25 on page 181 lists the naming conventions for interfaces on MPC7E-MRATE for MX240, MX480, MX960, MX2010, and MX2020 routers.

**Table 25: Interface Naming Convention for MPC7E-MRATE**

Packet Forwarding Engine	10-Gigabit Ethernet Interface	40-Gigabit Ethernet Interface	100-Gigabit Ethernet Interface
0	xe-x/0/0/[0-3]	et-x/0/0	-
	xe-x/0/1:[0-3]	et-x/0/1	-
	xe-x/0/2:[0-3]	et-x/0/2	et-x/0/2
	xe-x/0/3:[0-3]	et-x/0/3	-
	xe-x/0/4:[0-3]	et-x/0/4	-
	xe-x/0/5:[0-3]	et-x/0/5	et-x/0/5
1	xe-x/1/0:[0-3]	et-x/1/0	-
	xe-x/1/1:[0-3]	et-x/1/1	-
	xe-x/1/2:[0-3]	et-x/1/2	et-x/1/2
	xe-x/1/3:[0-3]	et-x/1/3	-
	xe-x/1/4:[0-3]	et-x/1/4	-
	xe-x/1/5:[0-3]	et-x/1/5	et-x/1/5

#### Related Documentation

- [Configuring Rate Selectability on MPC7E \(Multi-Rate\) to Enable Different Port Speeds on page 201](#)
- [Supported Active Physical Ports for Configuring Rate Selectability to Prevent Oversubscription on page 189](#)
- [Understanding Rate Selectability on page 176](#)

## Understanding Interface Naming Conventions for MIC-MRATE

MIC-MRATE consists of twelve ports that support multiple port speeds of 100 Gbps, 40 Gbps, and 10 Gbps. MIC-MRATE is supported on MPC8E (MX2K-MPC8E) and MPC9E (MX2K-MPC9E) on MX2000 line of routers.

Starting with Junos OS Release 17.3R1, MIC-MRATE is supported on MX10003 MPC on MX10003 routers.



**NOTE:** By default, the MIC-MRATE ports are configured as 10-Gigabit Ethernet ports.

MPC8E has a forwarding capacity of 240 Gbps for each Packet Forwarding Engine. In Junos OS Release 16.1R1 and later, you can upgrade MPC8E to provide an increased bandwidth of 1600 Gbps (1.6 Tbps), by using an add-on license. After you configure the **bandwidth 1.6T** statement, MPC8E provides an increased bandwidth of 1.6 Tbps. The forwarding capacity is increased to 400 Gbps for each Packet Forwarding Engine.

MPC9E has a forwarding capacity of 400 Gbps for each Packet Forwarding Engine. Packet Forwarding Engine oversubscription is not supported. So, demand on each Packet Forwarding Engine should be less than or equal to its forwarding capacity. For MPC8E, demand on each Packet Forwarding Engine should be less than or equal to 240 Gbps and for MPC9E, demand on each Packet Forwarding Engine should be less than or equal to 400 Gbps.



**NOTE:** On MPC8E with MIC-MRATE, you can configure four ports as 100-Gigabit Ethernet interfaces. On MPC9E with MIC-MRATE and on MPC8E configured to operate at 1.6 Tbps by using an add-on license, you can configure eight ports as 100-Gigabit Ethernet interfaces.

The 40-Gigabit Ethernet and 100-Gigabit Ethernet interfaces configured on the MIC-MRATE MIC follow the naming convention **et-fpc-slot/pic-slot/port-number**. The 10-Gigabit Ethernet interfaces configured on the MIC-MRATE MIC follow the naming convention **xe-fpc-slot/pic-slot/port-number:[logical-port-number]**.

For example, **xe-0/0/1:3** indicates a 10-Gigabit Ethernet interface configured on logical port 3 of physical port 1 of the MIC-MRATE MIC that is installed in the MPC slot 0. The interface name **et-0/0/2** indicates either a 40-Gigabit Ethernet interface or a 100-Gigabit



Ethernet interface configured on port 2 of MIC-MRATE MIC that is installed in the MPC slot 0.

Table 26 on page 183 lists the naming conventions used for interfaces on MIC-MRATE when installed on slot 0 of MPC8E and MPC9E. Table 27 on page 184 lists the naming conventions used for interfaces on MIC-MRATE when installed on slot 1 of MPC8E and MPC9E. MPC8E and MPC9E support two MIC-MRATE MICs each.



**NOTE:** The x in et-x/0/0 and xe-x/0/0:[0-3] refers to the MPC slot number.

**Table 26: Interface Naming Convention for MIC-MRATE Installed on Slot 0 of MPC8E and MPC9E**

Packet Forwarding Engine	10-Gigabit Ethernet Interface	40-Gigabit Ethernet Interface	100-Gigabit Ethernet Interface
0	xe-x/0/0:[0-3]	et-x/0/0	et-x/0/0
	xe-x/0/1:[0-3]	et-x/0/1	et-x/0/1
	xe-x/0/2:[0-3]	et-x/0/2	et-x/0/2
	xe-x/0/3:[0-3]	et-x/0/3	et-x/0/3
	xe-x/0/4:[0-3]	et-x/0/4	-
	xe-x/0/5:[0-3]	et-x/0/5	-
1	xe-x/0/6:[0-3]	et-x/0/6	et-x/0/6
	xe-x/0/7:[0-3]	et-x/0/7	et-x/0/7
	xe-x/0/8:[0-3]	et-x/0/8	et-x/0/8
	xe-x/0/9:[0-3]	et-x/0/9	et-x/0/9
	xe-x/0/10:[0-3]	et-x/0/10	-
	xe-x/0/11:[0-3]	et-x/0/11	-

**Table 27: Interface Naming Convention for MIC-MRATE Installed on Slot 1 of MPC8E and MPC9E**

Packet Forwarding Engine	10-Gigabit Ethernet Interface	40-Gigabit Ethernet Interface	100-Gigabit Ethernet Interface
2	xe-x/1/0:[0-3]	et-x/1/0	et-x/1/0
	xe-x/1/1:[0-3]	et-x/1/1	et-x/1/1
	xe-x/1/2:[0-3]	et-x/1/2	et-x/1/2
	xe-x/1/3:[0-3]	et-x/1/3	et-x/1/3
	xe-x/1/4:[0-3]	et-x/1/4	-
	xe-x/1/5:[0-3]	et-x/1/5	-
3	xe-x/1/6:[0-3]	et-x/1/6	et-x/1/6
	xe-x/1/7:[0-3]	et-x/1/7	et-x/1/7
	xe-x/1/8:[0-3]	et-x/1/8	et-x/1/8
	xe-x/1/9:[0-3]	et-x/1/9	et-x/1/9
	xe-x/1/10:[0-3]	et-x/1/10	-
	xe-x/1/11:[0-3]	et-x/1/11	-

Table 28 on page 184 lists the naming conventions used for interfaces on MIC-MRATE when installed on slot 0 of MX10003 MPC.

**Table 28: Interface Naming Convention for MIC-MRATE Installed on Slot 0 of Mx10003MPC**

Packet Forwarding Engine	10-Gigabit Ethernet Interface	40-Gigabit Ethernet Interface	100-Gigabit Ethernet Interface
0	xe-x/0/0:[0-3]	et-x/0/0	et-x/0/0
	xe-x/0/1:[0-3]	et-x/0/1	et-x/0/1
	xe-x/0/2:[0-3]	et-x/0/2	et-x/0/2
	xe-x/0/3:[0-3]	et-x/0/3	et-x/0/3
	xe-x/0/4:[0-3]	et-x/0/4	-
	xe-x/0/5:[0-3]	et-x/0/5	-

Table 28: Interface Naming Convention for MIC-MRATE Installed on Slot 0 of Mx10003MPC (continued)

Packet Forwarding Engine	10-Gigabit Ethernet Interface	40-Gigabit Ethernet Interface	100-Gigabit Ethernet Interface
1	xe-x/0/6:[0-3]	et-x/0/6	et-x/0/6
	xe-x/0/7:[0-3]	et-x/0/7	et-x/0/7
	xe-x/0/8:[0-3]	et-x/0/8	et-x/0/8
	xe-x/0/9:[0-3]	et-x/0/9	et-x/0/9
	xe-x/0/10:[0-3]	et-x/0/10	-
	xe-x/0/11:[0-3]	et-x/0/11	-

#### Related Documentation

- [Configuring Rate Selectability on MIC-MRATE to Enable Different Port Speeds on page 196](#)
- [Supported Active Physical Ports for Configuring Rate Selectability to Prevent Oversubscription on page 189](#)
- [Understanding Rate Selectability on page 176](#)

## Understanding Interface Naming Conventions for MX10003 MPC

The MX10003 MPC supports a Multi-Rate 12xQSFP28 Ethernet MIC (model numbers: JNP-MIC1 and JNP-MIC1-MACSEC) and the fixed-port PIC (6xQSFP).

Each of the 6 ports of the PIC supports 10-Gigabit Ethernet and 40-Gigabit Ethernet interfaces. Each of the 12 ports of the modular MIC supports 10-Gigabit Ethernet, 40-Gigabit Ethernet, and 100-Gigabit Ethernet interfaces. All the ports of the modular MIC can be configured as 100-Gigabit Ethernet interfaces.

The 40-Gigabit Ethernet and 100-Gigabit Ethernet interfaces configured on the MX10003 MPC follow the naming convention **et-fpc-slot/pic-slot/port-number**. The 10-Gigabit Ethernet interfaces follow the naming convention **xe-fpc-slot/pic-slot/port-number:[logical-port-number]**.

For example, **xe-0/0/1:3** indicates a 10-Gigabit Ethernet interface configured on logical port 3 of physical port 1 of the modular MIC that is installed in the MPC slot 1. The interface name **et-0/0/2** indicates either a 40-Gigabit Ethernet interface or a 100-Gigabit Ethernet interface configured on port 2 of modular MIC that is installed in the MPC slot 1.

[Table 7 on page 22](#) lists the naming conventions used for interfaces on the fixed-port PIC when installed in slot 1 of the MX10003 MPC. [Table 30 on page 186](#) lists the naming conventions used for interfaces on the modular MIC when installed in slot 1 of the MPC.



**NOTE:** The x in et-x/0/0 and xe-x/0/0:[0-3] refers to the MPC slot number.

**Table 29: Interface Naming Convention for the Fixed-Port PIC Installed in Slot 1 of MX10003 MPC**

Packet Forwarding Engine	10-Gigabit Ethernet Interface	40-Gigabit Ethernet Interface	100-Gigabit Ethernet Interface
0	xe-x/0/0:[0-3]	et-x/0/0	—
	xe-x/0/1:[0-3]	et-x/0/1	—
1	xe-x/0/2:[0-3]	et-x/0/2	—
	xe-x/0/3:[0-3]	et-x/0/3	—
2	xe-x/0/4:[0-3]	et-x/0/4	—
	xe-x/0/5:[0-3]	et-x/0/5	—

**Table 30: Interface Naming Convention for Modular MIC Installed in Slot 1 of MX10003 MPC**

Packet Forwarding Engine	10-Gigabit Ethernet Interface	40-Gigabit Ethernet Interface	100-Gigabit Ethernet Interface
0	xe-x/1/0:[0-3]	et-x/1/0	et-x/1/0
	xe-x/1/1:[0-3]	et-x/1/1	et-x/1/1
	xe-x/1/2:[0-3]	et-x/1/2	et-x/1/2
	xe-x/1/3:[0-3]	et-x/1/3	et-x/1/3
1	xe-x/1/4:[0-3]	et-x/1/4	et-x/1/4
	xe-x/1/5:[0-3]	et-x/1/5	et-x/1/5
	xe-x/1/6:[0-3]	et-x/1/6	et-x/1/6
	xe-x/1/7:[0-3]	et-x/1/7	et-x/1/7
2	xe-x/1/8:[0-3]	et-x/1/8	et-x/1/8
	xe-x/1/9:[0-3]	et-x/1/9	et-x/1/9
	xe-x/1/10:[0-3]	et-x/1/10	et-x/1/10
	xe-x/1/11:[0-3]	et-x/1/11	et-x/1/11

- Related Documentation**
- [Supported Active Physical Ports for Configuring Rate Selectability to Prevent Oversubscription on MX10003 MPC on page 192](#)
  - [MX10003 MPC on MX10003 Router Overview on page 43](#)

## Understanding Interface Naming Conventions for JNP10K-LC2101

JNP10K-LC2101 is a fixed-configuration MPC and contains six built-in PICs, PIC 0 to PIC 5. Each PIC supports 4 ports. All ports support multiple port speeds of 100 Gbps, 40 Gbps, and 10 Gbps and can be configured as 10-Gigabit Ethernet, 40-Gigabit Ethernet, and 100-Gigabit Ethernet interfaces.

JNP10K-LC2101 has a forwarding capacity of 240 Gbps for each Packet Forwarding Engine. JNP10K-LC2101 has six Packet Forwarding Engines. In Junos OS Release 18.2R1 and later, you can upgrade JNP10K-LC2101 to provide an increased bandwidth of 2400 Gbps (2.4 Tbps), by using an add-on license. After you configure the [bandwidth 2.4T](#) statement, JNP10K-LC2101 provides an increased bandwidth of 2.4 Tbps. The forwarding capacity is increased to 400 Gbps for each Packet Forwarding Engine. Packet Forwarding Engine oversubscription is not supported. So, demand on each Packet Forwarding Engine should be less than or equal to its forwarding capacity.

The 40-Gigabit Ethernet and 100-Gigabit Ethernet interfaces configured on the JNP10K-LC2101 MPC follow the naming convention **et-fpc-slot/pic-slot/port-number**. The 10-Gigabit Ethernet interfaces configured on the JNP10K-LC2101 MPC follow the naming convention **xe-fpc-slot/pic-slot/port-number:[logical-port-number]**.

For example, **xe-0/0/1:3** indicates a 10-Gigabit Ethernet interface configured on logical port 3 of physical port 1 of the JNP10K-LC2101 MPC that is installed in the MPC slot 0. The interface name **et-0/0/2** indicates either a 40-Gigabit Ethernet interface or a 100-Gigabit Ethernet interface configured on port 2 of the JNP10K-LC2101 MPC that is installed in the MPC slot 0.



**NOTE:** Each Packet Forwarding Engine maps to a single built-in PIC on the JNP10K-LC2101.

[Table 31 on page 188](#) lists the naming conventions used for interfaces on JNP10K-LC2101 for MX10008 routers. MX10008 routers support 8 JNP10K-LC2101 MPCs.



**NOTE:** The *x* in **et-x/0/0** and **xe-x/0/0:[0-3]** refers to the MPC slot number.

Table 31: Interface Naming Convention for JNP10K-LC2101 MPC

Packet Forwarding Engine	10-Gigabit Ethernet Interface	40-Gigabit Ethernet Interface	100-Gigabit Ethernet Interface
0	xe-x/0/0:[0-3]	et-x/0/0	et-x/0/0
	xe-x/0/1:[0-3]	et-x/0/1	et-x/0/1
	xe-x/0/2:[0-3]	et-x/0/2	et-x/0/2
	xe-x/0/3:[0-3]	et-x/0/3	et-x/0/3
1	xe-x/1/0:[0-3]	et-x/1/0	et-x/1/0
	xe-x/1/1:[0-3]	et-x/1/1	et-x/1/1
	xe-x/1/2:[0-3]	et-x/1/2	et-x/1/2
	xe-x/1/3:[0-3]	et-x/1/3	et-x/1/3
2	xe-x/2/0:[0-3]	et-x/2/0	et-x/2/0
	xe-x/2/1:[0-3]	et-x/2/1	et-x/2/1
	xe-x/2/2:[0-3]	et-x/2/2	et-x/2/2
	xe-x/2/3:[0-3]	et-x/2/3	et-x/2/3
3	xe-x/3/0:[0-3]	et-x/3/0	et-x/3/0
	xe-x/3/1:[0-3]	et-x/3/1	et-x/3/1
	xe-x/3/2:[0-3]	et-x/3/2	et-x/3/2
	xe-x/3/3:[0-3]	et-x/3/3	et-x/3/3
4	xe-x/4/0:[0-3]	et-x/4/0	et-x/4/0
	xe-x/4/1:[0-3]	et-x/4/1	et-x/4/1
	xe-x/4/2:[0-3]	et-x/4/2	et-x/4/2
	xe-x/4/3:[0-3]	et-x/4/3	et-x/4/3

Table 31: Interface Naming Convention for JNP10K-LC2101 MPC (continued)

Packet Forwarding Engine	10-Gigabit Ethernet Interface	40-Gigabit Ethernet Interface	100-Gigabit Ethernet Interface
5	xe-x/5/0:[0-3]	et-x/5/0	et-x/5/0
	xe-x/5/1:[0-3]	et-x/5/1	et-x/5/1
	xe-x/5/2:[0-3]	et-x/5/2	et-x/5/2
	xe-x/5/3:[0-3]	et-x/5/3	et-x/5/3

- Related Documentation**
- [Understanding Rate Selectability on page 176](#)
  - [JNP10K-LC2101 MPC on MX10008 Routers Overview on page 44](#)

## Supported Active Physical Ports for Configuring Rate Selectability to Prevent Oversubscription

MPC7E-MRATE has an aggregate forwarding capacity of 480 Gbps and a forwarding capacity of 240 Gbps on each Packet Forwarding Engine. Oversubscription of Packet Forwarding Engine capacity is not supported. The demand on each Packet Forwarding Engine must be less than or equal to its forwarding capacity. For instance, on MPC7E-MRATE, the demand on each Packet Forwarding Engine must be less than or equal to 240 Gbps.



**NOTE:** By default, the MPC7E-MRATE ports are configured as 10-Gigabit Ethernet ports.

When you configure rate selectability at the MIC level, all the ports supporting that port speed are enabled by default. This can lead to fabric oversubscription in certain cases. To prevent fabric oversubscription, you can configure the number of active ports that operate at the configured speed by using the **number-of-ports** **number-of-active-physical-ports** configuration statement. Additionally, interfaces are created only for the active ports.



**NOTE:** You cannot configure the number of active ports when you configure rate selectability at the port level.

Table 32 on page 190 lists the active physical ports on MPC7E-MRATE.

**Table 32: Active Physical Ports on MPC7E-MRATE MPC for Configuring Rate Selectability at PIC Level**

Ports Configured (number-of-ports Statement)	Active Physical Ports for Different Configured Speeds		
	10-Gigabit Ethernet	40-Gigabit Ethernet	100-Gigabit Ethernet
1	0	0	2
2	0, 1	0, 1	2, 5
3	0, 1, 2	0, 1, 2	2, 5
4	0, 1, 2, 3	0, 1, 2, 3	2, 5
5	0, 1, 2, 3, 4	0, 1, 2, 3, 4	2, 5
6	0, 1, 2, 3, 4, 5	0, 1, 2, 3, 4, 5	2, 5

MPC8E has a forwarding capacity of 240 Gbps for each Packet Forwarding Engine. MPC9E has a forwarding capacity of 400 Gbps for each Packet Forwarding Engine.

Oversubscription of Packet Forwarding Engine capacity is not supported. The demand on each Packet Forwarding Engine must be less than or equal to its forwarding capacity. For instance, on MPC8E, the demand on each Packet Forwarding Engine must be less than or equal to 240 Gbps and on MPC9E, the demand on each Packet Forwarding Engine must be less than or equal to 400 Gbps.



**NOTE:** By default, the MIC-MRATE ports are configured as 10-Gigabit Ethernet ports.

Table 33 on page 190, Table 34 on page 191 list the active physical ports on MPC8E and MPC9E.

**Table 33: Active Physical Ports on MIC-MRATE on MPC8E MPC for Configuring Rate Selectability at MIC Level**

Ports Configured (number-of-ports Statement)	Active Physical Ports for Different Configured Speeds		
	10-Gigabit Ethernet	40-Gigabit Ethernet	100-Gigabit Ethernet
1	0	0	0
2	0, 6	0, 6	0, 6
3	0, 1, 6	0, 1, 6	0, 1, 6
4	0, 1, 6, 7	0, 1, 6, 7	0, 1, 6, 7
5	0, 1, 2, 6, 7	0, 1, 2, 6, 7	0, 1, 6, 7
6	0, 1, 2, 6, 7, 8	0, 1, 2, 6, 7, 8	0, 1, 6, 7



**Table 33: Active Physical Ports on MIC-MRATE on MPC8E MPC for Configuring Rate Selectability at MIC Level (continued)**

Ports Configured (number-of-ports Statement)	Active Physical Ports for Different Configured Speeds		
	10-Gigabit Ethernet	40-Gigabit Ethernet	100-Gigabit Ethernet
7	0, 1, 2, 3, 6, 7, 8	0, 1, 2, 3, 6, 7, 8	0, 1, 6, 7
8	0, 1, 2, 3, 6, 7, 8, 9	0, 1, 2, 3, 6, 7, 8, 9	0, 1, 6, 7
9	0, 1, 2, 3, 4, 6, 7, 8, 9	0, 1, 2, 3, 4, 6, 7, 8, 9	0, 1, 6, 7
10	0, 1, 2, 3, 4, 6, 7, 8, 9, 10	0, 1, 2, 3, 4, 6, 7, 8, 9, 10	0, 1, 6, 7
11	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10	0, 1, 6, 7
12	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11	0, 1, 6, 7

**Table 34: Active Physical Ports on MIC-MRATE on MPC9E MPC and MPC8E MPC in 1.6T Mode for Configuring Rate Selectability at MIC Level**

Ports Configured (number-of-ports Statement)	Active Physical Ports for Different Configured Speeds		
	10-Gigabit Ethernet	40-Gigabit Ethernet	100-Gigabit Ethernet
1	0	0	0
2	0, 6	0, 6	0, 6
3	0, 1, 6	0, 1, 6	0, 1, 6
4	0, 1, 6, 7	0, 1, 6, 7	0, 1, 6, 7
5	0, 1, 2, 6, 7	0, 1, 2, 6, 7	0, 1, 2, 6, 7
6	0, 1, 2, 6, 7, 8	0, 1, 2, 6, 7, 8	0, 1, 2, 6, 7, 8
7	0, 1, 2, 3, 6, 7, 8	0, 1, 2, 3, 6, 7, 8	0, 1, 2, 3, 6, 7, 8
8	0, 1, 2, 3, 6, 7, 8, 9	0, 1, 2, 3, 6, 7, 8, 9	0, 1, 2, 3, 6, 7, 8, 9
9	0, 1, 2, 3, 4, 6, 7, 8, 9	0, 1, 2, 3, 4, 6, 7, 8, 9	0, 1, 2, 3, 6, 7, 8, 9
10	0, 1, 2, 3, 4, 6, 7, 8, 9, 10	0, 1, 2, 3, 4, 6, 7, 8, 9, 10	0, 1, 2, 3, 6, 7, 8, 9
11	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10	0, 1, 2, 3, 6, 7, 8, 9
12	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11	0, 1, 2, 3, 6, 7, 8, 9

**Related Documentation**

- [Configuring Rate Selectability on MPC7E \(Multi-Rate\) to Enable Different Port Speeds on page 201](#)
- [Configuring Rate Selectability on MIC-MRATE to Enable Different Port Speeds on page 196](#)
- [Understanding Rate Selectability on page 176](#)

## Supported Active Physical Ports for Configuring Rate Selectability to Prevent Oversubscription on MX10003 MPC

When you configure rate selectability at the MIC level, all the ports supporting that port speed are enabled by default. This can lead to fabric oversubscription in certain cases. To prevent fabric oversubscription, you can configure the number of active ports that operate at the configured speed by using the **number-of-ports** **number-of-active-physical-ports** configuration statement. Additionally, interfaces are created only for the active ports.



**NOTE:** You cannot configure the number of active ports when you configure rate selectability at the port level.

Starting in Junos OS Release 17.3R1, the MX10003 MPC supports rate selectability to prevent oversubscription of the Packet Forwarding Engine bandwidth.

[Table 35 on page 192](#) lists the active physical ports on MX10003 MPC for Configuring Rate Selectability at the MIC Level.

**Table 35: Active Physical Ports on the MX10003 MPC for configuring rate selectability at the MIC level**

Ports Configured (number-of-ports Statement)	Active Physical Ports for Different Configured Speeds		
	10-Gigabit Ethernet	40-Gigabit Ethernet	100-Gigabit Ethernet
1	0	0	0
2	0, 4	0, 4	0, 4
3	0, 4, 8	0, 4, 8	0, 4, 8
4	0, 1, 4, 8	0, 1, 4, 8	0, 1, 4, 8
5	0, 1, 4, 5, 8	0, 1, 4, 5, 8	0, 1, 4, 5, 8
6	0, 1, 4, 5, 8, 9	0, 1, 4, 5, 8, 9	0, 1, 4, 5, 8, 9
7	0, 1, 2, 4, 5, 8, 9	0, 1, 2, 4, 5, 8, 9	0, 1, 2, 4, 5, 8, 9
8	0, 1, 2, 4, 5, 6, 8, 9	0, 1, 2, 4, 5, 6, 8, 9	0, 1, 2, 4, 5, 6, 8, 9

**Table 35: Active Physical Ports on the MX10003 MPC for configuring rate selectability at the MIC level (continued)**

Ports Configured (number-of-ports Statement)	Active Physical Ports for Different Configured Speeds		
	10-Gigabit Ethernet	40-Gigabit Ethernet	100-Gigabit Ethernet
9	0, 1, 2, 4, 5, 6, 8, 9, 10	0, 1, 2, 4, 5, 6, 8, 9, 10	0, 1, 2, 4, 5, 6, 8, 9, 10
10	0, 1, 2, 3, 4, 5, 6, 8, 9, 10	0, 1, 2, 3, 4, 5, 6, 8, 9, 10	0, 1, 2, 3, 4, 5, 6, 8, 9, 10
11	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
12	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

[Table 36 on page 193](#) list the active physical ports on MX10003 MPC for Configuring Rate Selectability at PIC Level.

**Table 36: Active Physical Ports on MX10003 MPC for configuring rate selectability at the PIC level**

Ports Configured (number-of-ports Statement)	Active Physical Ports for Different Configured Speeds	
	10-Gigabit Ethernet	40-Gigabit Ethernet
1	0	0
2	0, 2	0, 2
3	0, 2, 4	0, 2, 4
4	0, 1, 2, 4	0, 1, 2, 4
5	0, 1, 2, 3, 4	0, 1, 2, 3, 4
6	0, 1, 2, 3, 4, 5	0, 1, 2, 3, 4, 5

- Related Documentation**
- [Understanding Rate Selectability on page 176](#)
  - [MX10003 MPC on MX10003 Router Overview on page 43](#)

## Supported Active Physical Rate-Selectable Ports to Prevent Oversubscription on MX204 Router

The maximum capacity of an MX204 router is 400 Gbps, which cannot be oversubscribed. In MX204, the network ports are available in two groups (referred to as PICs), with restrictions around the number and type of ports that can be configured without oversubscription.

Starting in Junos OS Release 17.4R1, the MX204 supports rate selectability to prevent oversubscription of the Packet Forwarding Engine bandwidth. The MX204 Packet Forwarding Engine has four 100-Gigabit Ethernet QSFP28 ports (referred to as PIC 0 ports) and eight 10-Gigabit Ethernet ports (referred to as PIC 1 ports). Each of the PIC 0 ports can be used as either a 100-Gigabit Ethernet QSFP28 port or a 40-Gigabit Ethernet QSFP28 port, or they can be configured as four 10-Gigabit Ethernet ports (using a breakout cable).

If you configure rate selectability at the PIC level, all the ports supporting that port speed are enabled by default. This can lead to oversubscription in certain cases. To prevent the oversubscription, you can configure the number of active ports that operate at the configured speed by using the **number-of-ports number-of-active-physical-ports** configuration statement. Additionally, interfaces are created only for the active ports.

**NOTE:**

- You cannot configure the number of active ports when you configure rate selectability at the port level.
- 

## Invalid Port Configuration

You must try to avoid configuring ports that can lead to oversubscription.

Following is an example of an invalid configuration:

```
4x100GE + 8X10GE
```

If you try to commit an invalid configuration, the configuration gets committed, but the port is not activated. This is because Junos OS allows you to configure a port before a line card is inserted. You will get an error message in the output of the **show chassis alarms** command and also in the log messages.



**NOTE:** When you are in port configuration mode, all the ports are configured as 10-Gigabit Ethernet.

---

## Configuring Active Ports on MX204 Router with Rate Selectability

Table 37 on page 195 summarizes the active ports with **number-of-ports** configured but without any rate selectability configuration for an MX204 router. Because there is no rate selectability configured, the default speed is used in these cases.

**Table 37: Active Physical Ports on the MX204 Router for Configuring Rate Selectability at PIC level**

PIC	Number of Ports (number-of-ports Statement)	Active Ports		
		PIC Level 10-Gigabit Ethernet Profile	PIC Level 40-Gigabit Ethernet Profile	PIC Level 100-Gigabit Ethernet Profile
PIC 0	0	-	-	-
	1	0	-	-
	2	0, 1	-	-
	3	0, 1, 2	-	-
	4	0, 1, 2, 3	-	-
PIC 1	0	-	-	-
	1	0	-	-
	2	0, 1	-	-
	3	0, 1, 2	-	-
	4	0, 1, 2, 3	-	-
	5	0, 1, 2, 3, 4	-	-
	6	0, 1, 2, 3, 4, 5	-	-
	7	0, 1, 2, 3, 4, 5, 6	-	-
	8	0, 1, 2, 3, 4, 5, 6, 7	-	-

Table 38 on page 195 summarizes the active ports without **number-of-ports** configured but with rate selectability at PIC-level configuration for an MX204 router.

**Table 38: Without number-of-ports But with Rate Selectability at PIC Level for MX204 Router**

PIC	Active Ports		
	PIC-Level 10-Gigabit Ethernet	PIC-Level 40-Gigabit Ethernet	PIC-Level 100-Gigabit Ethernet
PIC 0	0-3	0-3	0-3
PIC 1	0-7	-	-

Table 39 on page 196 summarizes the active ports with **number-of-ports** configured and rate selectability at PIC-level configuration for an MX204 router.

Table 39: With number-of-ports Rate Selectability at PIC level for MX204 Router

PIC	Number of Ports (number-of-ports Statement)	Active Ports		
		PIC-Level 10-Gigabit Ethernet	PIC-Level 40-Gigabit Ethernet	PIC-Level 100-Gigabit Ethernet
PIC 0	0	-	-	-
	1	0	0	0
	2	0, 1	0, 1	0, 1
	3	0, 1, 2	0, 1, 2	0, 1, 2
	4	0, 1, 2, 3	0, 1, 2, 3	0, 1, 2, 3
PIC 1	0	-	-	-
	1	0	-	-
	2	0, 1	-	-
	3	0, 1, 2	-	-
	4	0, 1, 2, 3	-	-
	5	0, 1, 2, 3, 4	-	-
	6	0, 1, 2, 3, 4, 5	-	-
	7	0, 1, 2, 3, 4, 5, 6	-	-
	8	0, 1, 2, 3, 4, 5, 6, 7	-	-

**Related Documentation**

- [MX204 Router Overview on page 45](#)
- [MX204 Router Rate-Selectability Overview on page 210](#)
- [Configuring Rate Selectability on MX204 to Enable Different Port Speeds on page 220](#)

## Configuring Rate Selectability on MIC-MRATE to Enable Different Port Speeds

Rate selectability enables you to configure the port speed either at the port level or at the MIC level. To configure all ports to operate at the same speed, you configure rate selectability at the MIC level, in which case you cannot configure the speed of individual ports. To configure rate selectability at the MIC level, use the **pic-mode** statement and specify the port speed. To configure different port speeds for each port, you configure rate selectability at the port level, in which case only the ports that are configured are enabled. To configure rate selectability at the port level, use the **speed** statement to

specify the speed of individual ports. This topic describes how to configure port speeds at the port level and at the MIC level.



**NOTE:** The *pic* in the configuration commands refers to the MRATE MIC. To specify *pic-number*, specify the MRATE MIC slot. For instance, when you use the `edit chassis fpc fpc-slot-number pic pic-slot-number` statement, specify the MPC slot number and the MIC-MRATE slot number.

- [Configuring Rate Selectability on MIC-MRATE at MIC Level on page 197](#)
- [Configuring Rate Selectability on MIC-MRATE at Port Level on page 199](#)

## Configuring Rate Selectability on MIC-MRATE at MIC Level

To configure all ports to operate at the same speed, you configure rate selectability at the MIC level. The default port speed is 10 Gbps for all ports. When you configure rate selectability at the MIC level, all the ports of the MIC that support the configured speed operate at that speed. To prevent oversubscription and ensure a guaranteed bandwidth, you can specify the number of active ports that operate at the configured speed by using the `number-of-ports number-of-active-physical-ports` statement. MIC-MRATE supports port speeds of 10 Gbps, 40 Gbps, and 100 Gbps.

For MPC8E, you can only configure 4 ports of the 12 MIC-MRATE ports with 100 Gbps port speed and the other ports are disabled. So, if you configure **100G** as the operating speed for ports 0, 1, 6, and 7, then the other ports are disabled on MPC8E. Similarly, when you configure the port speed as 100 Gbps at the MIC level on MPC9E, you can only configure 8 ports of the 12 MIC-MRATE ports to operate with that speed. So, if you configure **100G** as the operating speed for ports 0, 1, 2, 3, 6, 7, 8, and 9, then the other ports can support only 40 Gbps or 10 Gbps. However, enabling port speed of 40 Gbps or 10 Gbps at the MIC level, enables all ports and sets the desired port speed on all ports.

To configure rate selectability at the MIC level:

1. In configuration mode, navigate to the `[edit chassis fpc fpc-slot pic pic-number]` hierarchy level.

```
[edit ]
user@host# edit chassis fpc fpc-slot pic pic-number
```

For example:

```
[edit ]
user@host# edit chassis fpc 4 pic 0
```

2. Configure the `pic-mode pic-speed` statement to set the operating speed for the MIC. All ports of the MIC that support the configured speed operate at the configured speed. Values for the `pic-speed` option include: **10G**, **40G**, and **100G**.

```
[edit chassis fpc fpc-slot pic pic-number]
user@host# set pic-mode pic-speed
```

For example:

```
[edit chassis fpc 4 pic 0]
user@host# set pic-mode 10G
```

3. (Optional) To prevent oversubscription, you can choose to configure the number of active ports that operate at the port speed configured in Step 2. For information about the number of active ports and specific port numbers on MPC7E-MRATE, MPC8E, and MPC9E see [“Supported Active Physical Ports for Configuring Rate Selectability to Prevent Oversubscription”](#) on page 189.

```
[edit chassis fpc fpc-slot pic pic-number]
user@host# set number-of-ports number-of-active-physical-ports
```

For example:

```
[edit chassis fpc 4 pic 0]
user@host# set number-of-ports 8
```

4. Verify the configuration.

```
[edit chassis fpc 4 pic 0]
user@host# show
pic-mode 10G;
number-of-ports 8;
```

5. Commit your configuration changes.

In this example, you have configured 8 ports on MIC-MRATE with port speed of 10 Gbps. The other ports are disabled.



## Configuring Rate Selectability on MIC-MRATE at Port Level

To configure different port speeds for each port, you configure rate selectability at the port level. Only the ports that are configured are enabled. Other ports are automatically disabled. Configuring rate selectability at the port level provides you the flexibility of operating individual ports of the MIC at different supported speeds. For example, on MPC9E with MIC-MRATE, you can configure four 100-Gigabit Ethernet interfaces on ports 0, 1, 6, and 7 and two 40-Gigabit Ethernet interfaces on ports 3 and 8. You can use breakout transceivers to configure each 40-Gigabit Ethernet interfaces as four 10-Gigabit Ethernet interfaces.



**NOTE:** When you change the port speed at the port level, you must reset the MPC for the configuration to take effect. Because resetting the MPC takes several minutes and since it affects all the PFEs, you can choose to use the `request chassis mic mic-slot mic-slot-number fpc-slot fpc-slot-number (offline | online)` command to reset the MIC and apply your configuration changes. An alarm is generated indicating the change in port speed. For guidelines on configuring rate selectability, see [“Guidelines for Configuring Rate Selectability” on page 179](#).

To configure rate selectability at the port level:

1. In configuration mode, navigate to the `[edit chassis fpc fpc-slot pic pic-number]` hierarchy level.

```
[edit ]
user@host# edit chassis fpc fpc-slot pic pic-number
```

For example:

```
[edit ]
user@host# edit chassis fpc 4 pic 0
```

2. To indicate the speed at which the ports operate, configure the **speed** statement for the desired ports. According to your requirements, you can choose the **10G**, **40G**, or **100G** speed options.

```
[edit chassis fpc fpc-slot pic pic-number]
user@host# set port port-number speed (10G | 40G | 100G)
```

For example:

```
[edit chassis fpc 4 pic 0]
user@host# set port 0 speed 100G
user@host# set port 1 speed 100G
user@host# set port 3 speed 40G
user@host# set port 6 speed 100G
user@host# set port 7 speed 100G
```

```
user@host# set port 8 speed 40g
```



**NOTE:** All the twelve ports of MIC-MRATE support 10-Gbps and 40-Gbps port speeds. On MPC8E with MIC-MRATE, you can configure 4 ports out of the twelve MIC-MRATE ports with a port speed of 100 Gbps. On MPC9E with MIC-MRATE, you can configure 8 ports out of the twelve MIC-MRATE ports with a port speed of 100 Gbps.

3. Verify the configuration.

```
[edit chassis fpc 4 pic 0]
user@host# show
port 0 {
    speed 100g;
}
port 1 {
    speed 100g;
}
port 3 {
    speed 40g;
}
port 6 {
    speed 100g;
}
port 7 {
    speed 100g;
}
port 8 {
    speed 40g;
}
```

4. Commit your configuration changes.

In this example, you have configured 4 ports on MIC-MRATE with port speed of 100 Gbps and 2 ports with port speed of 40 Gbps. The total capacity per MIC, based on this configuration, is 480 Gbps. MIC-MRATE has two Packet Forwarding Engines. The forwarding capacity for each Packet Forwarding Engine is 400 Gbps for MPC9E and 240 Gbps for MPC8E. The configured value does not exceed the forwarding capacity and so is a valid configuration.

**Related  
Documentation**

- [number-of-ports on page 721](#)
- [pic-mode on page 739](#)
- [speed on page 784](#)
- [Supported Active Physical Ports for Configuring Rate Selectability to Prevent Oversubscription on page 189](#)
- [Understanding Rate Selectability on page 176](#)

## Configuring Rate Selectability on MPC7E (Multi-Rate) to Enable Different Port Speeds

Each of the six ports of PIC 0 and PIC 1 of an MPC7E-MRATE MPC supports port speeds of 10 Gbps and 40 Gbps. However, only ports 2 and 5 of both the PICs support port speed of 100 Gbps. Because the MPC7E-MRATE MPC is rate-selectable, you can choose to configure all supported ports of the MPC to operate at the same supported speed or configure all the ports at different supported speeds.

You configure rate selectability at the PIC level if you intend to operate all the ports of the MPC7E-MRATE MPC at the same speed. That is, you can choose to configure the PIC to operate at a supported speed, and then all the *supported ports* of the PIC operate at the configured speed. For example, if you choose to configure PIC 0 at 100-Gbps speed, only ports 2 and 5 of PIC 0 operate at 100-Gbps speed, while the other ports of the PIC are disabled. Similarly, if you choose to configure PIC 0 at 10-Gbps or 40-Gbps speed, all the ports of the PIC are enabled to operate at those speeds. Additionally, you can prevent oversubscription by specifying the number of active physical ports that operate at 10-Gbps, 40-Gbps, and 100-Gbps speeds.

You configure rate selectability at the port level if you intend to operate different ports of the MPC7E-MRATE MPC at different supported speeds. That is, you configure each port to operate at a supported speed.



**NOTE:** The MPC7E-MRATE MPC supports an aggregate bandwidth of 480 Gbps, and each of the two PICs supports a bandwidth limit of 240 Gbps. If the aggregate port capacity configured exceeds 240 Gbps per PIC, the configuration is not supported.

- [Configuring Rate Selectability at PIC Level on page 201](#)
- [Configuring Rate Selectability at Port Level on page 203](#)

### Configuring Rate Selectability at PIC Level

To configure rate selectability at the PIC level:

1. In configuration mode, navigate to the `[edit chassis fpc fpc-slot pic pic-number]` hierarchy level.

```
[edit ]
user@host# edit chassis fpc fpc-slot pic pic-number
```

For example:

```
[edit ]
user@host# edit chassis fpc 4 pic 0
```

2. Configure the **pic-mode** statement to set the operating speed for the PIC's ports. According to your requirements, you can choose from the options **10G**, **40G**, or **100G**.

```
[edit chassis fpc fpc-slot pic pic-number]
user@host# set pic-mode pic-speed
```

For example:

```
[edit chassis fpc 4 pic 0]
user@host# set pic-mode 10G
```

- (Optional) To prevent oversubscription, you can choose to configure the number of ports that operate at the mode configured in Step 2.

```
[edit chassis fpc fpc-slot pic pic-number]
user@host# set number-of-ports number-of-active-physical-ports
```

For example:

```
[edit chassis fpc 4 pic 0]
user@host# set number-of-ports 6
```

- Verify the configuration.

```
[edit chassis fpc 4 pic 0]
user@host# show
pic-mode 10G;
number-of-ports 6;
```

- Commit your configuration changes.

If the **number-of-ports** statement is *not* configured, all the ports that support the speed configured in Step 2 are enabled. That is, depending on that selection, ports 0 through 5 are enabled for speeds of 10-gigabit or 40-gigabit, while ports 2 and 5 are enabled for 100-gigabit. [Table 32 on page 190](#) lists the physical ports that are enabled when the **number-of-ports** statement is configured.

**Table 40: Active Physical Ports on MPC7E-MRATE MPC Based on the number-of-ports Configuration**

Ports Configured (number-of-ports Statement)	Active Physical Ports for Different Configured Speeds		
	10-Gigabit	40-Gigabit	100-Gigabit
1	0	0	2
2	0, 1	0, 1	2, 5
3	0, 1, 2	0, 1, 2	2, 5
4	0, 1, 2, 3	0, 1, 2, 3	2, 5
5	0, 1, 2, 3, 4	0, 1, 2, 3, 4	2, 5

Table 40: Active Physical Ports on MPC7E-MRATE MPC Based on the number-of-ports Configuration (continued)

Ports Configured (number-of-ports Statement)	Active Physical Ports for Different Configured Speeds		
	10-Gigabit	40-Gigabit	100-Gigabit
6	0, 1, 2, 3, 4, 5	0, 1, 2, 3, 4, 5	2, 5

## Configuring Rate Selectability at Port Level

To configure rate selectability at the port level:

1. In configuration mode, navigate to the `[edit chassis fpc fpc-slot pic pic-number]` hierarchy level.

```
[edit ]
user@host# edit chassis fpc fpc-slot pic pic-number
```

For example:

```
[edit ]
user@host# edit chassis fpc 4 pic 0
```

2. To indicate the speed at which the ports operate, configure the **speed** statement for the desired ports. According to your requirements, you can choose the **10g**, **40g**, or **100g** speed options.

```
[edit chassis fpc fpc-slot pic pic-number]
user@host# set port port-number speed (10g | 40g | 100g)
```

For example:

```
[edit chassis fpc 4 pic 0]
user@host# set port 0 speed 10g
user@host# set port 1 speed 10g
user@host# set port 2 speed 100g
user@host# set port 3 speed 40g
```



**NOTE:** All the six ports of PIC 0 and PIC 1 of an MPC7E-MRATE MPC support 10-Gbps and 40-Gbps port speeds. However, only ports 2 and 5 of both the PICs support 100-Gbps speed.

3. Verify the configuration.

```
[edit chassis fpc 4 pic 0]
user@host# show
port 0 {
    speed 10g;
}
```

```
port 1 {  
    speed 10g;  
}  
port 2 {  
    speed 100g;  
}  
port 3 {  
    speed 40g;  
}
```

4. Commit your configuration changes.



---

**NOTE:**

Note the following when configuring rate selectability on an MPC7E-MRATE MPC:

- If rate selectability is not configured, all ports of the MPC7E-MRATE MPC operate as four 10-Gigabit Ethernet interfaces by default. Therefore, when booting the MPC:
    - If rate selectability is not configured or if invalid port speeds are configured, each port operates as four 10-Gigabit Ethernet interfaces. An alarm is generated to indicate that the ports of the MPC7E-MRATE MPC are operating as four 10-Gigabit Ethernet interfaces.
    - If valid port speeds are configured, the MPC PICs operate at the configured speed.
  - When you change an existing port speed configuration, you must reset the MPC for the configuration to take effect. Because resetting the MPC takes several minutes and as it affects all the Packet Forwarding Engines, you can choose to use the request chassis pic pic-slot *pic-slot-number* fpc-slot *fpc-slot-number* (online | offline) command to apply your configuration changes quickly. An alarm is generated indicating the change in port speed configuration.
  - When you change an existing port speed configuration with an *invalid* port speed configuration, an alarm is generated indicating that the port speed configuration is invalid. The MPC continues to operate using the previously configured valid port speed configuration. However, if the MPC or PIC is restarted with the committed invalid port configuration, all ports of the MPC operate as four 10-Gigabit Ethernet interfaces by default.
  - You cannot configure rate selectability at the PIC level and the port level simultaneously. Error messages are displayed when you try to commit such configurations.
  - When you configure rate selectability at the port level, only the configured ports are enabled. Other ports are disabled.
  - Logical interfaces can be created only on ports that are enabled.
-

- Related Documentation**
- [MPC7E \(Multi-Rate\) on MX Series Routers Overview on page 33](#)
  - [pic-mode on page 739](#)
  - [speed on page 784](#)
  - [number-of-ports on page 721](#)

## MX10003 MPC Rate-Selectability Overview

MX10003 MPC supports a Multi-Rate 12xQSFP28 Ethernet Modular Interface Card (MIC) and a fixed-port PIC (6xQSFP). The MX10003 Packet Forwarding Engine has 6x40GE QSFP ports on the fixed-port PIC and 12x100GE QSFP28 ports on the MIC. For more information see *MX10003 MPC (Multi-Rate)*. Rate selectability enables you to configure the port speed either at the port level or at the MIC level. To configure all ports to operate at the same speed, you configure rate selectability at the MIC or PIC level. For more information see “[Configuring Rate Selectability on MX10003 MPC at MIC/PIC Level](#)” on [page 217](#). To configure different port speeds for each port, you configure rate selectability at the port level, in which case only the ports that are configured are enabled. For more information see “[Configuring Rate Selectability on MX10003 MPC at Port Level](#)” on [page 218](#).

The ports on the MX10003 MPC are called rate-selectable or multirate ports as they support multiple port speeds. You can choose to configure all supported ports of the fixed port PIC or the MIC to operate at the same speed or configure all the ports at different supported speeds. However, all the PIC or MIC ports do not support all the port speeds. For example, you can choose to configure:

- A port in 4x10GE mode using QSFP-4x10GE optics and 4x10GE breakout cables.
- A port in 40GE mode using QSFP optics.
- A port in 100GE mode using QSFP28 optics.
- A port in 1GE mode (for the ports that is already operating in 10GE mode only) using QSFP-4x10GE optics on fixed PIC and non-MacSEC MIC.



### NOTE:

- You can use the [port-checker tool](#) to check whether the combination of ports you want to use is valid or not.
- You can use the [Hardware Compatibility Tool](#) to find information about the pluggable transceivers supported on MX10003 router.

The MX10003 MPC supports three Packet Forwarding Engines. The forwarding capacity of each Packet Forwarding Engine is 400Gbps which cannot be oversubscribed.

The MIC supports 12 ports. Each Packet Forwarding Engine is mapped to 4 ports of the MIC. Port 0 through port 3 are mapped to PFE0, port 4 through port 7 are mapped to PFE1, and port 8 through port 11 are mapped to PFE2. The fixed-port PIC supports 6 ports.

Each Packet Forwarding Engine is mapped to two ports of the fixed-port PIC. Port 0 and port 1 are mapped to PFE0, port 2 and port 3 are mapped to PFE1, and port 4 and port 5 are mapped to PFE2. You can use the command **show chassis pic fpc-slot slot-number pic-slot slot-number** to display Packet Forwarding Engine mapping information and port speed information.

[Table 41 on page 206](#) summarizes the Packet Forwarding Engine mapping and the supported port speeds.

**Table 41: Rate Selectability of MX10003 MPC**

PIC	Port Number	Port Speed Supported
PIC 0 (Fixed-port PIC)	0–5	40-Gigabit Ethernet 4x10-Gigabit Ethernet  <b>NOTE:</b> You can configure one or all 10G port operating in 4X10-Gigabit Ethernet mode to operate in 1-Gigabit Ethernet mode.
PIC 1 (Multi-Rate MIC)	0–11	100-Gigabit Ethernet 40-Gigabit Ethernet 4x10-Gigabit Ethernet  <b>NOTE:</b> On non-MACsec MIC, you can configure one or all the 4X10-Gigabit Ethernet port to 1-Gigabit Ethernet mode.

Starting with Junos OS Release 18.1R1, the non-MACsec MIC on the MX10003 routers support 1-Gigabit Ethernet mode also on 10-Gigabit Ethernet mode ports.

Each of the 100-Gigabit Ethernet or 40-Gigabit Ethernet port can be split to four 10-Gigabit Ethernet ports that can be configured to operate as 1-Gigabit Ethernet port. You can also use 4x10GE LR breakout optics (QSFP-4X10GE-LR) at the MX10003 end and 1-Gigabit Ethernet EX optics at the remote end. It is only optional to use Juniper optics (SFP-GE40KM) at the remote end, as any vendor's EX (not SX or LX) optics can be used. Refer to [Hardware Compatibility Tool](#) for the list of pluggable transceivers supported on MX10003 router.

On MX10003 routers, when the port operates in 10-Gbps speed, you can change the operating speed to 1Gbps using the configuration **speed 1G** as follows:

```
set interfaces interface-name gigether-options speed 1g
```

Refer [speed \(Gigabit Ethernet interface\)](#) for more details.

Once you commit this configuration, the operating speed of the 10-Gbps port changes to 1-Gbps speed, but the **show interface** command displays for the field **Physical interface** (that is, the interface name prefix) as **XE/\_/\_** and the **Speed Configuration** (that is, operating port speed) as **1GE**. On fixed-port PIC and non-MACsec MIC, you can configure one or all 10-Gbps port operating in 4X10-Gbps speed to operate in 1-Gbps speed.

1-Gbps speed is only supported in non-autonegotiation mode.





## NOTE:

- Any interface operating at 10-Gigabit Ethernet mode can be independently converted to 1-Gigabit Ethernet mode. For example, in multi-rate connections through split cables, when one of the ports operates at 1GE mode, the other three ports can still be configured in 1GE or 10GE mode.
- The MACsec MIC does not support 1-Gbps speed.
- The rate selectability at PIC level and port level does not support 1-Gbps speed. But you can configure the port configured at 10-Gbps speed to operate at 1-Gbps speed using the `speed (Gigabit Ethernet interface)` configuration statement at Gigabit Ethernet interface level.
- The 1-Gbps operation mode is only supported in non-autonegotiation mode.
- ISSU is not supported for the interfaces that are configured with 1-Gigabit Ethernet mode. If ISSU upgrade is carried out in 1-Gigabit Ethernet mode, then the behavior is unexpected and traffic loss can be expected. Refer *request vmhost software in-service-upgrade* for more details.

To view the speed configured for the interface, execute the `show interfaces extensive` command. The **Speed Configuration** output parameter in the command output indicates the current operation speed of the interface. If the interface is configured with 1-Gbps speed, then **Speed Configuration** displays **1G**; if the interface is configured with 10-Gbps speed, **Speed Configuration** displays **AUTO**.

For example:

```
user@host>show interfaces xe-0/1/11:0 extensive
Physical interface: xe-0/1/11:0, Enabled, Physical link is Up
Interface index: 284, SNMP ifIndex: 609, Generation: 383
Link-level type: Ethernet, MTU: 9192, MRU: 9200, LAN-PHY mode, Speed: 10Gbps,

  BPDU Error: None, Loop Detect PDU Error: None, MAC-REWRITE Error: None,
  Loopback: None, Source filtering: Disabled, Flow control: Enabled,
  Speed Configuration: 1G
...
```

In this example, the **Speed Configuration** output parameter displays 1G, which means the operation speed of xe-0/1/11:0 interface is 1-Gbps speed.

MX10003 MPC has an aggregate forwarding capacity of 1.2 Tbps and a forwarding capacity of 400 Gbps on each Packet Forwarding Engine. Oversubscription of Packet Forwarding Engine capacity is not supported. The demand on each Packet Forwarding Engine must be less than or equal to its forwarding capacity. For more information see, [“Supported Active Physical Ports for Configuring Rate Selectability to Prevent Oversubscription on MX10003 MPC” on page 192](#). For instance, for MX10003 MPC, the demand on each Packet Forwarding Engine must be less than or equal to 400 Gbps.

For example, on the fixed-port PIC, if you configure the port speed on one ports as 40 Gbps or on two port as 40 Gbps, then you can configure the ports on the MIC in one of the following ways:

- Three 100-Gigabit Ethernet interfaces
- Two 100-Gigabit Ethernet and two 40-Gigabit Ethernet interfaces
- Two 100-Gigabit Ethernet and eight 10-Gigabit Ethernet interfaces

The same rule is applicable to all Packet Forwarding Engines independently.



**NOTE:** Only the Interface that is already operating at 10GE mode can be configured to operate at 1GE mode using `speed (Gigabit Ethernet interface)` configuration statement as follows:

`set interfaces interface-name gigether-options speed lg`

Table 42 on page 208 summarizes the port mode configuration at the Packet Forwarding Engine level.

**Table 42: PFE Based Port Mode Configuration**

Port Speed configuration on PIC1(Gbps)				Port speed configuration on PIC0(Gbps)	
100	100	100	100	0	0
100	100	100	10/40	0	0
100	100	100	0	10/40	10/40
100	100	10/40	10/40	10/40	10/40
100	10/40	10/40	10/40	10/40	10/40
10/40	10/40	10/40	0	10/40	10/40
10/40	10/40	10/40	10/40	0	0

Table 43 on page 208 summarizes the PIC mode configuration.

**Table 43: PIC Mode Configuration**

Port Speed configuration on PIC1(Gbps)	Port speed configuration on PIC0(Gbps)
100	0 Configure the number of ports to 0.
10	10
40	40

Note the following caveats while configuring rate selectability on the MX10003 MPC:

- By default, the MX10003 router comes up with the PIC mode where all the interface operates at the same speed of 10-Gbps. That is, by default, both the PICs (PIC 0 and PIC 1) operate at 10-Gbps speed. To use different port speeds, you must first switch to the port mode and then change the default speed.

To change the default speed, you must select a port and configure a different port speed on it and reset both the PICs for the configuration to take effect. For example, select 40GE or 100GE on PIC 1 and 10GE on PIC 0. For this configuration to take effect, you must reset both PICs.

- Regardless of the line card— MIC (PIC1) or fixed-port PIC (PIC0) installed —you must configure *both the PICs and all the associated ports*, under the **[edit chassis]** hierarchy. Configuring ports on only one of the PICs results in an invalid configuration.
- The port speed configuration on the fixed-port PIC and the MIC must be homogenous. However, at port level you can configure port speeds in heterogeneous mode. For more information, see *Configuring Rate Selectability on MX10003 MPC at Port Level*.

For example, if you want to configure the port speed as 10 Gbps, the port speed of the fixed-port PIC and the MIC should be configured to 10 Gbps. If you want to configure the port speed as 40 Gbps, the port speed of the fixed-port PIC and the MIC should be configured to 40 Gbps. However, if you choose to configure all ports of the MX10003 MPC to operate as 100-Gigabit Ethernet interfaces, the ports on the MIC have to be configured to 100 Gbps and the **number-of-ports number-of-active-physical-ports** statement on the fixed-port PIC must be set to 0.

- When you configure rate selectability at the port level, only the configured ports are active. Other ports are disabled.
- When you choose an existing port speed configuration with an *invalid* port speed configuration, an alarm is generated indicating that the port speed configuration is invalid.
- You cannot configure the ports which will oversubscribe the Packet Forwarding Engine. For example, a combination of eleven 100-Gigabit Ethernet interfaces on the MIC and ten 10-Gigabit Ethernet interfaces on the fixed-port PIC will result in an invalid configuration. If you try to commit an invalid configuration, the configuration will get committed. However, the port will not be activated. You can execute the **show chassis alarms** to display the error message.
- You cannot configure rate selectability at the PIC level and the port level simultaneously. Error messages are displayed when you try to commit such configurations.

## Invalid Port Configuration

You cannot configure the ports which will oversubscribe the Packet Forwarding Engine.

For example, a combination of eleven 100-Gigabit Ethernet interfaces on the MIC and ten 10-Gigabit Ethernet interfaces on the fixed-port PIC will result in an invalid configuration. If you try to commit an invalid configuration, the configuration will get committed. However, the port will not be activated. You can execute the **show chassis alarms** to display the error message. The valid configuration in this case would be eleven

100-Gigabit Ethernet interfaces on the MIC and eight 10-Gigabit Ethernet interfaces on the fixed-port PIC.

#### Release History Table

Release	Description
18.1R1	Starting with Junos OS Release 18.1R1, the non-MACsec MIC on the MX10003 routers support 1-Gigabit Ethernet mode also on 10-Gigabit Ethernet mode ports.

#### Related Documentation

- [MX10003 MPC on MX10003 Router Overview on page 43](#)
- [Supported Active Physical Ports for Configuring Rate Selectability to Prevent Oversubscription on MX10003 MPC on page 192](#)
- [Configuring Rate Selectability on MX10003 MPC to Enable Different Port Speeds on page 216](#)
- [speed \(Gigabit Ethernet interface\) on page 786](#)

## MX204 Router Rate-Selectability Overview

The maximum amount of data that can be transmitted through a port at any given second either by a network device or by a component of the network device (such as a line card) is known as the port speed. Port speed is measured in kilobits per second (Kbps), gigabits per second (Gbps), and terabits per second (Tbps). If a port can be configured to support both single and multiple speeds, the port is known as a rate-selectable port. Because the port is part of a network device (router or switch) or a network component (such as MPC, MIC) the component is known as a rate-selectable component. Rate selectability enables you to configure different port speeds at the port level or at the PIC level.

The MX204 has four rate-selectable ports (referred to as PIC 0 ports) that can be configured as 100-Gigabit Ethernet ports or 40-Gigabit Ethernet port, or each port can be configured as four 10-Gigabit Ethernet ports (by using a breakout cable). The MX204 also has eight 10-Gigabit Ethernet ports (referred to as PIC 1 ports). On PIC 0 and PIC 1, you can configure the 10-Gigabit Ethernet port(s) to operate in 1-Gigabit Ethernet mode (using [speed \(Gigabit Ethernet interface\)](#) command). The four rate-selectable ports supports QSFP28/QSFP+ transceivers, whereas the eight 10-Gigabit Ethernet ports supports SFP+ transceivers. Knowing the exact details of the port speeds for the PICs helps you to choose the speeds to configure on the ports or on the PICs. You can view the port speeds of the PIC by executing [show chassis pic](#) command. For more information, see [“MX204 Router Overview” on page 45](#) and [“Supported Active Physical Rate-Selectable Ports to Prevent Oversubscription on MX204 Router” on page 193](#).

**NOTE:**

- By default, the MX204 router comes up with the PIC mode where all the interface operates at the same speed of 10-Gbps. that is, by default, both the PICs (PIC 0 and PIC 1) operate at 10-Gbps speed. To use different port speeds, you must first switch to the port mode and then change the default speed.

To change the default speed, you must select a port and configure a different port speed on it and reset both the PICs for the configuration to take effect. For example, select 40GE or 100GE on PIC 0 and 10GE on PIC 1. For this configuration to take effect, you must reset both PICs.

- You can use the [port-checker tool](#) to check whether the combination of ports you want to use is valid or not.
- You can use the [Hardware Compatibility Tool](#) to find information about the pluggable transceivers supported on MX204 router.

The MX204 router supports two types of rate selectability configuration options:

- **PIC Level Configuration:** To configure all ports to operate at the same speed, you configure rate selectability at the PIC level.
- **Port Level Configuration:** To configure different port speeds for each port, you configure rate selectability at the port level, in which case only the ports that are configured are enabled.

To configure all ports to operate at the same speed, configure rate selectability at the PIC level, in which case you cannot configure the speed of individual ports. To configure rate selectability at the PIC level, use the [pic-mode](#) statement and specify the port speed. To configure different port speeds for each port, configure rate selectability at the port level, in which case only the ports that are configured are enabled. To configure rate selectability at the port level, use the [speed](#) statement to specify the speed of individual ports.

The examples below show the sample CLI command output of the port speed capability of the 4-port PIC 0 with QSFP+ transceivers and the 8-port PIC 1 with SFP+ transceivers on the MX204 router.

```
user@host> show chassis pic fpc-slot 0 pic-slot 0
...
Port Speed Information:

  Port  Capable Port Speeds
  0     4x10GE, 40GE, 100GE
  1     4x10GE, 40GE, 100GE
  2     4x10GE, 40GE, 100GE
  3     4x10GE, 40GE, 100GE
...
user@host> show chassis pic fpc-slot 0 pic-slot 1
...
Port Speed Information:
```

Port	Capable Port Speeds
0	10GE
1	10GE
2	10GE
3	10GE
4	10GE
5	10GE
6	10GE
7	10GE
...	

Table 41 on page 206 summarizes the rate selectability of the MX204 routers.

**Table 44: Rate Selectability of MX204 Routers**

PIC	Port Number	Port Speed Supported
PIC 0	0–3	100-Gigabit Ethernet 40-Gigabit Ethernet 4x10-Gigabit Ethernet  <b>NOTE:</b> <ul style="list-style-type: none"> <li>Default port speed is 4x10 Gigabit Ethernet.</li> <li>Supports 1-Gbps speed on 10 Gigabit Ethernet ports.</li> </ul>
PIC 1	0–7	10 Gigabit Ethernet  <b>NOTE:</b> Supports 1-Gbps speed on 10 Gigabit Ethernet ports.

Starting with Junos OS Release 18.1R1, the 10-Gbps port can operate in 1-Gbps mode also.

Each of the four 100-Gigabit Ethernet or 40-Gigabit Ethernet port can be split to four 10-Gigabit Ethernet ports that can be configured to operate as 1-Gigabit Ethernet port. You can also use 4x10GE LR breakout optics (QSFP-4X10GE-LR) at the MX204 end and 1-Gigabit Ethernet EX optics at the remote end. It is only optional to use Juniper optics (SFP-GE40KM) at the remote end, as any vendor's EX (not SX or LX) optics can be used. Refer to [Hardware Compatibility Tool](#) for the list of pluggable transceivers supported on MX204 router.

MX204 router also support 1-Gigabit Ethernet port on the fixed 10-Gigabit Ethernet SFP ports with 1GE SFPs in it.

On MX204 routers, when the port is operating in 10-Gbps speed, you can change the operating speed to 1Gbps using the configuration statement **Speed 1G** as follows:

```
set interfaces interface-name gigether-options speed 1g
```

Refer [speed \(Gigabit Ethernet interface\)](#) for more details.

Once you commit this configuration, the operating speed of the 10-Gbps port changes to 1-Gbps speed, but the **show interface** command displays for the field **Physical interface** (that is, the interface name prefix) as **XE /\_/\_** and the **Speed Configuration** (that is, operating port speed) as **1GE**.

On MRATE PIC, each channel per port can be configured individually as 1-Gigabit Ethernet port.



#### NOTE:

- The interface name prefix must be **xe**.
- The rate selectability at PIC level and port level does not support 1-Gbps speed. But you can configure the port configured at 10-Gbps speed to operate at 1-Gbps speed using the **speed (Gigabit Ethernet interface)** configuration statement at Gigabit Ethernet interface level.
- The 1-Gbps operation mode is supported with **speed 1g** configuration. For optics other than SFP-T, in 1G mode, the peer interfaces must be configured to non-autonegotiation mode.

To view the speed configured for the interface, execute the **show interfaces extensive** command. The **Speed Configuration** output parameter in the command output indicates the current operation speed of the interface. If the interface is configured with 1-Gbps speed, then **Speed Configuration** displays 1G; if the interface is configured with 10-Gbps speed, Speed Configuration displays AUTO.

For example:

```
user@host>show interfaces xe-0/1/11:0 extensive
Physical interface: xe-0/1/11:0, Enabled, Physical link is Up
Interface index: 284, SNMP ifIndex: 609, Generation: 383
Link-level type: Ethernet, MTU: 9192, MRU: 9200, LAN-PHY mode, Speed: 10Gbps,

  BPDU Error: None, Loop Detect PDU Error: None, MAC-REWRITE Error: None,
  Loopback: None, Source filtering: Disabled, Flow control: Enabled,
  Speed Configuration: 1G
...
```

In this example, the **Speed Configuration** output parameter displays 1G, which means the operation speed of xe-0/1/11:0 interface is 1-Gbps speed.

## User-Configurable Rate Selectability of MX204 Routers

You can also configure rate selectability on MX204 routers.

[Table 45 on page 214](#) summarizes the user-configurable rate selectability of MX204 routers.

Table 45: Configurable Rate Selectability of MX204 Router

Port Speed Configuration on PIC 0 (Gbps)	Port Speed Configuration on PIC 1 (Gbps)
100	0 Configure the number of active ports to 0.
10	10
40	0 Configure the number of active ports to 0.

Only the Interface that is already operating at 10GE mode can be configured to operate at 1GE mode using `speed (Gigabit Ethernet interface)` configuration statement as follows:

**set interfaces *interface-name* gigether-options speed *lg***



**NOTE:** The MX204 router does not support heterogeneous mode. That is, in PIC mode if 40-Gbps or 100-Gbps speed is configured on PIC 0, then the `number-of-ports` on PIC 1 must be configured to 0 only.

## Maximum number of 10/40/100GE ports Configurable at PIC and Port Mode

Following table summarizes the maximum number of 10/40/100 Gigabit Ethernet ports per PIC configurable at PIC and port levels:

Table 46: Maximum number of 10/40/100 Gigabit Ethernet ports Configurable at PIC and Port Level

Maximum Ports	Maximum Ports configurable at PIC Mode (on both PIC0 and PIC1)	Maximum Ports Configurable at Port Mode (on both PIC0 and PIC1)
10/1 Gigabit Ethernet Ports	24  Which means 16 ports from PIC 0 and 8 Ports from PIC 1.	20  Which means 12 ports from PIC 0 and 8 Ports from PIC 1.
40 Gigabit Ethernet Ports	4  Only 4 ports from PIC 0 as PIC 1 supports only 10 Gbps Speed.	4
100 Gigabit Ethernet Ports	4  Only 4 ports from PIC 0 as PIC 1 supports only 10 Gbps Speed.	4

## Port Configuration - PIC Level

On PIC 0, if each of the four ports is configured to operate at 100-Gbps speed, then you must configure all the 8 ports at PIC 1 to 0 (using `number-of-ports` statement). On PIC



0, if ports 0, 1, and 2 are set to 100-Gbps, and port 3 is set to 10-Gbps or 40-Gbps, then you should configure all the 8 ports at PIC 1 to 0 (using **number-of-port** statement), and so on as listed in the below table.

The following table only lists few valid combination of port speeds on PIC 0 and PIC1 of MX204 router. You are not limited to configure only the below mentioned example port configurations. For more valid port configuration values, refer [port-checker tool](#).

Table 47: Port Configuration at PIC Level in MX204 Routers

Port Mode											
PIC 0				PIC 1							
100	100	100	100	0							
Configure the number of active ports to 0.											
100	100	100	10/40	0							
Configure the number of active ports to 0.											
100	100	10/40	10/40	10	10	10	10	10	10	10	10
100	10/40	10/40	10/40	10	10	10	10	10	10	10	10
10/40	10/40	10/40	10/40	0							
Configure the number of ports to 0.											
PIC Mode											
PIC 0 (with four rate-selectable ports)							PIC 1 (with eight 10-Gigabit Ethernet ports)				
100	100		100	100			0				
							Configure the number of active ports to 0.				
40	40		40	40			0				
							Configure the number of active ports to 0.				
10	10		10	10			10				
							Configure all the eight 10-Gigabit Ethernet ports to 10.				



**NOTE:** Only the Interface that is already operating at 10GE mode can be configured to operate at 1GE mode using **speed (Gigabit Ethernet interface)** configuration statement as follows:

```
set interfaces interface-name gigether-options speed lg
```

#### Release History Table

Release	Description
18.1R1	Starting with Junos OS Release 18.1R1, the 10-Gbps port can operate in 1-Gbps mode also.

#### Related Documentation

- [Supported Active Physical Rate-Selectable Ports to Prevent Oversubscription on MX204 Router on page 193](#)
- [Configuring Rate Selectability on MX204 to Enable Different Port Speeds on page 220](#)
- [speed on page 784](#)
- [speed \(Gigabit Ethernet interface\) on page 786](#)
- [show chassis pic on page 2019](#)
- [number-of-ports on page 721](#)
- [pic-mode on page 739](#)

## Configuring Rate Selectability on MX10003 MPC to Enable Different Port Speeds

Rate selectability enables you to configure the port speed either at the port level or at the MIC level. To configure all ports to operate at the same speed, configure rate selectability at the MIC level, in which case you cannot configure the speed of individual ports. To configure rate selectability at the MIC level, use the **pic-mode** statement and specify the port speed. To configure different port speeds for each port, configure rate selectability at the port level, in which case only the ports that are configured are enabled. To configure rate selectability at the port level, use the **speed** statement to specify the speed of individual ports. This topic describes how to configure port speeds at the port level and at the MIC or PIC level.



**NOTE:** Regardless of the line card— MIC (PIC1) or fixed-port PIC (PIC0) installed—you must configure *both the PICs and all the associated ports*, under the [edit chassis] hierarchy. Configuring ports on only one of the PICs results in an invalid configuration.

- [Configuring Rate Selectability on MX10003 MPC at MIC/PIC Level on page 217](#)
- [Configuring Rate Selectability on MX10003 MPC at Port Level on page 218](#)

## Configuring Rate Selectability on MX10003 MPC at MIC/PIC Level

To configure all ports to operate at the same speed, configure rate selectability at the MIC or PIC level. When you configure rate selectability at the MIC or PIC level, all the ports of the MIC that support the configured speed operate at that speed. To prevent oversubscription and to ensure a guaranteed bandwidth, specify the number of active ports that operate at the configured speed by using the **number-of-ports** *number-of-active-physical-ports* statement. The MX10003 MPC supports port speeds of 10 Gbps, 40 Gbps, and 100 Gbps.

To configure rate selectability at the MIC/PIC level:

1. In configuration mode, navigate to the **[edit chassis fpc fpc-slot pic pic-number]** hierarchy level.

```
[edit ]
user@host# edit chassis fpc fpc-slot pic pic-number
```

For example:

```
[edit ]
user@host# edit chassis fpc 0 pic 0
```

2. Configure the **pic-mode pic-speed** statement to set the operating speed for the MIC. All ports of the MIC that support the configured speed operate at the configured speed. Values for the **pic-speed** option are 10G, 40G, and 100G.

```
[edit chassis fpc fpc-slot pic pic-number]
user@host# set pic-mode pic-speed
```

For example:

```
[edit chassis fpc 0 pic 0]
user@host# set pic-mode 10G
```

3. (Optional) To prevent oversubscription, you can choose to configure the number of active ports that operate at the port speed configured in Step 2. For information about the number of active ports and specific port numbers on the MX10003 MPC, see [“Supported Active Physical Ports for Configuring Rate Selectability to Prevent Oversubscription on MX10003 MPC”](#) on page 192.

```
[edit chassis fpc fpc-slot pic pic-number]
user@host# set number-of-ports number-of-active-physical-ports
```

For example:

```
[edit chassis fpc 0 pic 0]
user@host# set number-of-ports 8
```

4. Verify the configuration.

```
[edit chassis fpc 0 pic 0]
user@host# show
pic-mode 10G;
number-of-ports 8;
```

5. Commit your configuration changes.

In this example, you have configured 8 ports on the MPC with port speed of 10 Gbps. The other ports are disabled.

## Configuring Rate Selectability on MX10003 MPC at Port Level

To configure different port speeds for each port, you configure rate selectability at the port level. Only the ports that are configured are enabled. Other ports are automatically disabled. Configuring rate selectability at the port level provides you the flexibility of operating individual ports of the PIC at different supported speeds.

If you want to configure a port speed of 40 Gbps on the MIC and the fixed-port PIC, you can choose any of the following example configurations:

- Configure one port of the fixed-port PIC as a 40-Gigabit Ethernet interface and three ports of the MIC as 40-Gigabit Ethernet interfaces.
- Configure two ports of the fixed-port PIC as 40-Gigabit Ethernet interfaces and three ports of the MIC as 40-Gigabit Ethernet interfaces.
- Configure three ports of the MIC as 40-Gigabit Ethernet interfaces and two ports of the fixed-port PIC as 40-Gigabit Ethernet interfaces.
- Configure four ports of the MIC as 40-Gigabit Ethernet interfaces only.



**NOTE:** While configuring rate selectability, when you switch to PIC mode from port mode or vice-versa, the PIC is reset automatically. However, when you change the port speed at the port level, the PIC has to be reset by executing the `request chassis pic pic-slot mic-slot-number fpc-slot fpc-slot-number (offline | online)` command. For guidelines on configuring rate selectability, see [“Guidelines for Configuring Rate Selectability” on page 179](#).

To configure rate selectability at the port level:

1. In configuration mode, navigate to the `[edit chassis fpc fpc-slot pic pic-number]` hierarchy level.

```
[edit ]
user@host# edit chassis fpc fpc-slot pic pic-number
```

For example:

```
[edit ]
user@host# edit chassis fpc 0 pic 0
```

- To indicate the speed at which the ports operate, configure the **speed** statement for the desired ports. According to your requirements, you can choose the 10G, 40G, and 100G speed options.

```
[edit chassis fpc fpc-slot pic pic-number]
user@host# set port port-number speed (10G | 40G | 100G)
```

For example:

```
[edit chassis fpc 0 pic 0]
user@host# set port 0 speed 10G
user@host# set port 1 speed 10G
user@host# set port 3 speed 40G
```

- Verify the configuration.

```
[edit chassis fpc 0 pic 0]
user@host# show
port 0 {
    speed 10g;
}
port 1 {
    speed 10g;
}
port 3 {
    speed 40g;
}
```

- Commit your configuration changes.

In this example, you have configured 2 ports with port speed of 10 Gbps and 1 port with port speed of 40 Gbps.



**NOTE:** Starting in Junos OS Release 18.1R1, the 10-Gbps port can operate in 1-Gbps mode also using the [speed \(Gigabit Ethernet interface\)](#) configuration statement at Gigabit Ethernet interface level. Refer to “[MX10003 MPC Rate-Selectability Overview](#)” on page 205 for more details.

#### Related Documentation

- [number-of-ports on page 721](#)
- [pic-mode on page 739](#)
- [speed on page 784](#)
- [Understanding Rate Selectability on page 176](#)

## Configuring Rate Selectability on MX204 to Enable Different Port Speeds

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Rate selectability enables you to configure the port speed either at the port level or at the PIC level. To configure all ports to operate at the same speed, configure rate selectability at the PIC level, in which case you cannot configure the speed of individual ports. To configure rate selectability at the PIC level, use the `pic-mode` statement and specify the port speed. To configure different port speeds for each port, configure rate selectability at the port level, in which case only the ports that are configured are enabled. To configure rate selectability at the port level, use the `speed` statement to specify the speed of individual ports. This topic describes how to configure port speeds at the port level and at the PIC level.

Note the following caveats while configuring rate selectability on the MX204 routers:

- If rate selectability is not configured, all ports of the MX204 router operate as 10-Gigabit Ethernet interfaces.
- In PIC mode, the MX204 router does not support heterogeneous mode. That is, in PIC mode if 40-Gbps or 100-Gbps speed is configured on PIC 0, then the `number-of-ports` on PIC 1 must be configured to 0 only. For more information, see “MX204 Router Rate-Selectability Overview” on page 210.
- The heterogeneous mode is supported only on port mode.
- When you configure rate selectability at the port level, only the configured ports are active. Other ports are disabled.
- When you choose an existing port speed configuration with an *invalid* port speed configuration, an alarm is generated indicating that the port speed configuration is invalid.
- You cannot configure rate selectability at the PIC level and the port level simultaneously. Error messages are displayed when you try to commit such configurations.
- [Configuring Rate Selectability on MX204 at PIC Level on page 220](#)
- [Configuring Rate Selectability on MX204 at Port Level on page 222](#)

### Configuring Rate Selectability on MX204 at PIC Level

To configure all ports to operate at the same speed, you configure rate selectability at the PIC level. When you configure rate selectability at the PIC level, all the ports of the PIC that support the configured speed operate at that speed. To prevent oversubscription and ensure a guaranteed bandwidth, you can specify the number of active ports that operate at the configured speed by using the `number-of-ports` **`number-of-active-physical-ports`** statement. The MX204 has four rate-selectable ports (referred to as PIC 0 ports) that can be configured as 100-Gigabit Ethernet ports or 40-Gigabit Ethernet port, or each port can be configured as four 10-Gigabit Ethernet ports (by using a breakout cable). The MX204 also has eight 10-Gigabit Ethernet ports (referred to as PIC 1 ports).

To configure rate selectability at the PIC level:

1. In configuration mode, navigate to the `[edit chassis fpc fpc-slot pic pic-number]` hierarchy level.

```
[edit ]
user@host# edit chassis fpc fpc-slot pic pic-number
```

For example:

```
[edit ]
user@host# edit chassis fpc 0 pic 0
```

2. Configure the `pic-mode pic-speed` statement to set the operating speed for the PIC. All ports of the PIC that support the configured speed operate at the configured speed. Values for the `pic-speed` option are **10G**, **40G**, and **100G**.

```
[edit chassis fpc fpc-slot pic pic-number]
user@host# set pic-mode pic-speed
```

For example:

```
[edit chassis fpc 0 pic 0]
user@host# set pic-mode 10G
```

3. (Optional) To prevent oversubscription, you can choose to configure the number of active ports that operate at the port speed configured in Step 2. For information about the number of active ports and specific port numbers on the MX204 routers see [“Supported Active Physical Rate-Selectable Ports to Prevent Oversubscription on MX204 Router” on page 193](#).

```
[edit chassis fpc fpc-slot pic pic-number]
user@host# set number-of-ports number-of-active-physical-ports
```

For example:

```
[edit chassis fpc 0 pic 0]
user@host# set number-of-ports 4
```

4. Verify the configuration.

```
[edit chassis fpc 0 pic 0]
user@host# show
pic-mode 10G;
number-of-ports 4;
```

5. Commit your configuration changes.

In this example, you have configured 4 ports on the PIC0 with port speed of 10 Gbps.

## Configuring Rate Selectability on MX204 at Port Level

To configure different port speeds for each port, you configure rate selectability at the port level. Only the ports that are configured are enabled. Other ports are automatically disabled. Configuring rate selectability at the port level provides you the flexibility of operating individual ports of the PIC at different supported speeds.



**NOTE:** When you change the port speed at the port level, you must reset the PIC for the configuration to take effect. Resetting the PIC takes several minutes and affects all the Packet Forwarding Engines. To avoid this, use the `request chassis pic pic-slot pic-slot-number fpc-slot fpc-slot-number (offline | online)` command to reset the PIC and apply your configuration changes. An alarm is generated indicating the change in port speed. For guidelines on configuring rate selectability, see [“Guidelines for Configuring Rate Selectability” on page 179](#).

To configure rate selectability at the port level:

1. In configuration mode, navigate to the `[edit chassis fpc fpc-slot pic pic-number]` hierarchy level.

```
[edit ]
user@host# edit chassis fpc fpc-slot pic pic-number
```

For example:

```
[edit ]
user@host# edit chassis fpc 0 pic 0
```

2. To indicate the speed at which the ports operate, configure the **speed** statement for the desired ports. According to your requirements, you can choose the **10G**, **40G**, or **100G** speed options.

```
[edit chassis fpc fpc-slot pic pic-number]
user@host# set port port-number speed (10G | 40G | 100G)
```

For example:

```
[edit chassis fpc 0 pic 0]
user@host# set port 0 speed 100G
user@host# set port 1 speed 40G
user@host# set port 2 speed 40G
user@host# set port 3 speed 10G
```

3. Verify the configuration.

```
[edit chassis fpc 0 pic 0]
user@host# show
```



```

port 0 {
    speed 100g;
}
port 1 {
    speed 40g;
}
port 2 {
    speed 40g;
}
port 3 {
    speed 10g;
}
}

```

4. Commit your configuration changes.

In this example, you have configured 2 ports on the PICO with port speed of 40 Gbps, 1 port with port speed of 10 Gbps, and 1 port with port speed of 100 Gbps.



**NOTE:** Starting in Junos OS Release 18.1R1, the 10-Gbps port can operate in 1-Gbps mode also using the [speed \(Gigabit Ethernet interface\)](#) configuration statement at Gigabit Ethernet interface level. Refer to “[MX10003 MPC Rate-Selectability Overview](#)” on page 205 for more details.

#### Related Documentation

- [number-of-ports on page 721](#)
- [pic-mode on page 739](#)
- [speed on page 784](#)
- [Understanding Rate Selectability on page 176](#)
- [MX204 Router Overview on page 45](#)
- [MX204 Router Rate-Selectability Overview on page 210](#)
- [Supported Active Physical Rate-Selectable Ports to Prevent Oversubscription on MX204 Router on page 193](#)
- [request chassis pic on page 876](#)

## Configuring Rate Selectability on JNP10K-2101 MPC to Enable Different Port Speeds

Rate selectability enables you to configure the port speed either at the port level or at the PIC level. To configure all ports to operate at the same speed, configure rate selectability at the PIC level, in which case you cannot configure the speed of individual ports. To configure rate selectability at the PIC level, use the **pic-mode** statement and specify the port speed. To configure different port speeds for each port, configure rate selectability at the port level, in which case only the ports that are configured are enabled. To configure rate selectability at the port level, use the **speed** statement to specify the

speed of individual ports. This topic describes how to configure port speeds at the port level and at the PIC level.

- [Configuring Rate Selectability on JNP10K-2101 MPC at PIC Level on page 224](#)
- [Configuring Rate Selectability on JNP10K-LC2101 MPC at Port Level on page 225](#)

## Configuring Rate Selectability on JNP10K-2101 MPC at PIC Level

To configure all ports to operate at the same speed, configure rate selectability at the PIC level. When you configure rate selectability at the PIC level, all the ports of the PIC that support the configured speed operate at that speed. To prevent oversubscription and to ensure a guaranteed bandwidth, specify the number of active ports that operate at the configured speed by using the **number-of-ports** *number-of-active-physical-ports* statement. The JNP10K-LC2101 MPC supports port speeds of 10 Gbps, 40 Gbps, and 100 Gbps.

To configure rate selectability at the PIC level:

1. In configuration mode, navigate to the **[edit chassis fpc fpc-slot pic pic-number]** hierarchy level.

```
[edit ]
user@host# edit chassis fpc fpc-slot pic pic-number
```

For example:

```
[edit ]
user@host# edit chassis fpc 5 pic 2
```

2. Configure the **pic-mode** *pic-speed* statement to set the operating speed for the PIC. All ports of the PIC that support the configured speed operate at the configured speed. Values for the *pic-speed* option are 10G, 40G, and 100G.



**NOTE:** When you configure the **pic-mode** as 100 Gbps and the Packet Forwarding Engine bandwidth is 240 Gbps, only the first two ports support 100 Gbps. The other ports are disabled.

```
[edit chassis fpc fpc-slot pic pic-number]
user@host# set pic-mode pic-speed
```

For example:

```
[edit chassis fpc 5 pic 2]
user@host# set pic-mode 10G
```

3. (Optional) To prevent oversubscription, you can choose to configure the number of active ports that operate at the port speed configured in Step 2.

```
[edit chassis fpc fpc-slot pic pic-number]
user@host# set number-of-ports number-of-active-physical-ports
```

For example:

```
[edit chassis fpc 5 pic 2]
user@host# set number-of-ports 2
```

4. Verify the configuration.

```
[edit chassis fpc 5 pic 2]
user@host# show
pic-mode 10G;
number-of-ports 2;
```

5. Commit your configuration changes.

In this example, you have configured 2 ports on the MPC with port speed of 10 Gbps. The other ports are disabled.

## Configuring Rate Selectability on JNP10K-LC2101 MPC at Port Level

To configure different port speeds for each port, you configure rate selectability at the port level. Only the ports that are configured are enabled. Other ports are automatically disabled. Configuring rate selectability at the port level provides you the flexibility of operating individual ports of the PIC at different supported speeds.



**NOTE:** While configuring rate selectability, when you switch to PIC mode from port mode or vice-versa, the PIC is reset automatically. However, when you change the port speed at the port level, the PIC has to be reset by executing the `request chassis pic pic-slot pic-slot-number fpc-slot fpc-slot-number (offline | online)` command. For guidelines on configuring rate selectability for JNP10K-LC2101, see [“Guidelines for Configuring Rate Selectability” on page 179](#).

To configure rate selectability at the port level:

1. In configuration mode, navigate to the `[edit chassis fpc fpc-slot pic pic-number]` hierarchy level.

```
[edit ]
user@host# edit chassis fpc fpc-slot pic pic-number
```

For example:

```
[edit ]
user@host# edit chassis fpc 0 pic 0
```

- To indicate the speed at which the ports operate, configure the **speed** statement for the desired ports. According to your requirements, you can choose the 10G, 40G, and 100G speed options.



**NOTE:** If you configure the speed as 100 Gbps for 3 ports and the Packet Forwarding Engine bandwidth is 240 Gbps, an alarm is raised as it is an invalid configuration. The value of only the first two ports support 100 Gbps. The other ports are disabled.

```
[edit chassis fpc fpc-slot pic pic-number]
user@host# set port port-number speed (10G | 40G | 100G)
```

For example:

```
[edit chassis fpc 0 pic 0]
user@host# set port 0 speed 10G
user@host# set port 1 speed 10G
user@host# set port 3 speed 40G
```

- Verify the configuration.

```
[edit chassis fpc 0 pic 0]
user@host# show
port 0 {
    speed 10g;
}
port 1 {
    speed 10g;
}
port 3 {
    speed 40g;
}
```

- Commit your configuration changes.

In this example, you have configured 2 ports with port speed of 10 Gbps and 1 port with port speed of 40 Gbps.

#### Related Documentation

- [number-of-ports on page 721](#)
- [pic-mode on page 739](#)
- [speed on page 784](#)
- [Understanding Rate Selectability on page 176](#)

## CHAPTER 7

# Port Mirroring Instances Configuration Overview

- [Understanding Port-Mirroring Instances on Different Routers on page 227](#)
- [Configuring Port-Mirroring Instances on M320 Routers on page 228](#)
- [Configuring Port-Mirroring Instances on M120 Routers on page 228](#)
- [Configuring Port-Mirroring Instances on MX Series 5G Universal Routing Platforms on page 229](#)

## Understanding Port-Mirroring Instances on Different Routers

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You can configure port mirroring for IPv4 and IPv6 traffic on all M Series, T Series, and MX Series routers. In addition, on the M7i, M10i, M120, M320, and MX Series routers, you can configure port mirroring for Layer 2 VPLS traffic.

You configure global port mirroring by including the **port-mirroring** statement at the **[edit forwarding-options]** hierarchy level. Configuring port-mirroring properties globally results in the properties being applied system-wide to all the Packet Forwarding Engines and their respective ports.

On MX Series, M320, and M120 routers, you can configure named port-mirroring instances for Layer 2 VPLS traffic. Configuring port-mirroring instances enables you to customize each instance with different properties for input-sampling and port-mirroring output destinations, instead of having to use a single system-wide configuration for port mirroring.

You configure multiple port-mirroring instances by including the **instance port-mirroring-instance-name** statement at the **[edit forwarding-options port-mirroring]** hierarchy level. You can then associate individual port-mirroring instances with an FPC, PIC, or FEB (depending on the router).



**NOTE:** When you configure port-mirroring for the same traffic flow twice, for example, for family Inet and family VPLS, you must configure separate named port-mirror instances for each traffic flow. Inheriting port-mirroring parameters from another instance might result in unexpected behavior.

For more information about configuring port mirroring on all routers, see the *Routing Policies, Firewall Filters, and Traffic Policers Feature Guide*. For more information on configuring port mirroring for Layer 2 VPLS traffic on MX Series routers, see the *Junos OS Layer 2 Configuration Guide*.

- Related Documentation**
- [Configuring Port-Mirroring Instances on MX Series 5G Universal Routing Platforms on page 229](#)
  - [Configuring Port-Mirroring Instances on M320 Routers on page 228](#)
  - [Configuring Port-Mirroring Instances on M120 Routers on page 228](#)

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## Configuring Port-Mirroring Instances on M320 Routers

You can associate only one port-mirroring instance with a specific FPC on an M320 router.

To associate a port-mirroring instance with a specific FPC, include the **port-mirror-instance** *port-mirroring-instance-name* statement at the **[edit chassis fpc slot-number]** hierarchy level:

```
[edit chassis]
fpc slot-number {
  port-mirror-instance port-mirroring-instance-name;
}
```

The properties of the port-mirroring instance associated with an FPC override any global port-mirroring properties (configured by including the **port-mirroring** statement at the **[edit forwarding-options]** hierarchy level.)



NOTE:

- Layer 2 VPLS port mirroring is supported only for Enhanced III FPCs on M320 routers.
- Ensure that the *port-mirroring-instance-name* specified at the **[edit chassis fpc slot-number]** hierarchy level matches the *port-mirroring-instance-name* configured at the **[edit forwarding-options port-mirroring instance port-mirroring-instance-name]** hierarchy level.

- Related Documentation**
- [Understanding Port-Mirroring Instances on Different Routers on page 227](#)

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## Configuring Port-Mirroring Instances on M120 Routers

You can associate only one port-mirroring instance with a specific FEB on an M120 router.

To associate a port-mirroring instance with a FEB, include the **port-mirror-instance** *port-mirroring-instance-name* statement at the **[edit chassis feb slot-number]** hierarchy level:

```
[edit chassis]
feb slot-number {
  port-mirror-instance port-mirroring-instance-name;
}
```

The properties of the port-mirroring instance associated with the FEB override any global port-mirroring properties (configured by including the **port-mirroring** statement at the **[edit forwarding-options]** hierarchy level.)



**NOTE:** In a FEB redundancy group, you must associate a port-mirroring instance only with the primary FEB. During failover or switchover, the port-mirroring instance is automatically associated with the backup FEB that fails over or switches over as the primary FEB.

For information about configuring FPC-to-FEB connectivity on an M120 router, see “Configuring the Junos OS to Support FPC to FEB Connectivity on M120 Routers” on page 432.

#### Related Documentation

- [Understanding Port-Mirroring Instances on Different Routers on page 227](#)

## Configuring Port-Mirroring Instances on MX Series 5G Universal Routing Platforms

On an MX Series router with a DPC card, you can configure port-mirroring instances both at the DPC level and at the PIC level. However, on MX Series routers with MPCs, port mirroring instances can only be bound to the FPC level and not up to the PIC level.

- [Configuring Port-Mirroring Instances at the DPC Level on page 229](#)
- [Configuring Port-Mirroring Instances at the PIC Level on page 230](#)

### Configuring Port-Mirroring Instances at the DPC Level

A port-mirroring instance configured at the FPC level for the DPC is bound to all the Packet Forwarding Engines on the DPC.

To associate a port-mirroring instance with a specific DPC and its Packet Forwarding Engines, include the **port-mirror-instance** *port-mirroring-instance-name* statement at the **[edit chassis fpc slot-number]** hierarchy level:

```
[edit chassis]
fpc slot-number {
  port-mirror-instance port-mirroring-instance-name;
}
```

The properties of the port-mirroring instance associated with the DPC override any global port-mirroring properties (configured by including the **port-mirroring** statement at the **[edit forwarding-options]** hierarchy level).

## Configuring Port-Mirroring Instances at the PIC Level



**NOTE:** On MX Series routers with MPCs, port mirroring instances can only be bound to the FPC level and not up to the PIC level. For MX Series routers with a DPC card, both levels are supported.

For MX Series routers, there is a one-to-one mapping of Packet Forwarding Engines and PICs. Therefore, a port-mirroring instance configured at the PIC level is bound to its Packet Forwarding Engines and ports.

To associate a port-mirroring instance with a specific Packet Forwarding Engine, include the **port-mirror-instance** *port-mirroring-instance-name* statement at the **[edit chassis fpc slot-number pic slot-number]** hierarchy level:

```
[edit chassis]
fpc slot-number {
  port-mirror-instance port-mirroring-instance-name-a;
  pic slot-number {
    port-mirror-instance port-mirroring-instance-name-b;
  }
}
```

The properties of the port-mirroring instance associated with the PIC override the properties of the port-mirroring instance associated with the DPC (configured by including the **port-mirroring** *port-mirroring-instance-name* statement at the **[edit chassis fpc slot-number]** hierarchy level).

For more information about configuring port mirroring for Layer 2 VPLS traffic on MX Series routers, see the *Junos MX Series Ethernet Services Routers Layer 2 Configuration Guide*.

**See Also**   • [Understanding Port-Mirroring Instances on Different Routers on page 227](#)



## CHAPTER 8

# Configuring Clocking and Synchronization

- [Centralized Clocking Overview on page 232](#)
- [Ethernet Synchronization Message Channel Overview on page 238](#)
- [Getting Started Configuring Clock Synchronization on PTX Series Routers on page 240](#)
- [Interface and Router Clock Sources Overview on page 240](#)
- [Synchronous Ethernet Overview on page 242](#)
- [Synchronous Ethernet on 10-Gigabit Ethernet MIC Overview on page 252](#)
- [Precision Time Protocol Overview on page 256](#)
- [Configuring G.8275.1 Profile on page 260](#)
- [Understanding Clock Synchronization on page 263](#)
- [Understanding ESMC Quality Level Mapping on page 280](#)
- [PTP Trace Overview on page 284](#)
- [Understanding Hybrid Mode on page 288](#)
- [Line Card Redundancy Overview on page 291](#)
- [Configuring Junos OS to Support an External Clock Synchronization Interface for M Series, MX Series, and T Series Routers on page 292](#)
- [Configuring Clock Synchronization Interface on MX Series Routers on page 293](#)
- [Clock Sources for PTX Series Packet Transport Routers on page 306](#)
- [Synchronizing Internal Stratum 3 Clock to External Clock Sources on PTX Series Routers on page 308](#)
- [Example: Configuring Synchronous Ethernet on MX Series Routers on page 311](#)
- [Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 316](#)
- [Configuring Precision Time Protocol on page 319](#)
- [Example: Configuring Precision Time Protocol on page 325](#)
- [Configuring Hybrid Mode and ESMC Quality Level Mapping on page 329](#)
- [Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 333](#)
- [Example: Configuring Centralized Clocking on the Enhanced MX Switch Control Board on page 340](#)
- [Example: Configuring Centralized Clocking on an MX2020 on page 349](#)

## Centralized Clocking Overview

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Starting with Junos OS Release 12.2, the Enhanced SCB—SCBE—and from Junos OS Release 13.3, the Enhanced SCB—SCBE2—on the MX240, MX480, and MX960 routers support a Stratum 3 clock module that functions as a centralized point within the chassis for clock monitoring, filtering, holdover, and selection.

The Stratum 3 clock module produces a 19.44 MHz clock that is locked to a chassis synchronization clock source that is configured with the highest quality. The chassis clock signals are transmitted through the backplane to all the MPCs. The MPCs route the clock signals to their MICs, where the clock signals are driven out on all line interfaces thereby allowing the timing information to be distributed to the downstream routers.

You can configure external and line input synchronization sources at the **[edit chassis synchronization output]** hierarchy level, at the **[edit chassis synchronization source interfaces]** hierarchy level, and at the **[edit chassis synchronization interfaces]** hierarchy level, that become candidates to be selected by the chassis's clock selection algorithm. The clock selection algorithm selects the highest-quality candidate clock source, which is then used as the chassis's synchronization source.

The external clock interface on SCBE allows the building-integrated timing supply (BITS) clock source or the clock signals received from the global positioning system (GPS) receiver to act as an input clock source to the centralized timing circuit, or allows the centralized timing signals to act as an output clock source to the BITS source or to the GPS receiver.

The centralized mode is applicable to mobile backhaul infrastructures and for network transition from traditional TDM to Ethernet network elements with the support of Synchronous Ethernet.

### Points to Remember

The following are the points to remember about centralized clocking:

- Before you begin configuring centralized clocking on an interface that uses Synchronous Ethernet, ensure that you have configured the interface as a chassis synchronization source to the router that provides a Synchronous Ethernet clock source.
- Before you remove the SCBE from the router, you must delete the configuration under the **[edit chassis synchronization]** hierarchy. Similarly, before you remove the SCBE2 from the router, you must delete the configuration under the **[edit chassis synchronization]** hierarchy.
- On SCBE2, the external-0/0 interface is located on **SCB0** and the external-1/0 interface is located on **SCB1**.

When you configure the external clock interface for input, the BITS or GPS clock source—the source depends on how you configure the interface—sends the synchronized input clock signals to the centralized timing circuit in the SCBE. When you configure the external clock interface for output, the centralized timing circuit

sends out the synchronized clock signal—BITS or GPS—to be transmitted to the downstream routers.

For more information about SCBE hardware, see *SCBE2-MX Description* and *SCBE2-MX LEDs*.

The following sections explain centralized clocking and its features in detail:



**NOTE:** Hereafter, all features that are explained for SCBE are also applicable for SCBE2 unless otherwise specified.

- [Stratum 3 Clock Module on page 233](#)
- [BITS and GPS Support on page 233](#)
- [External Clock Interface Input on page 234](#)
- [External Clock Interface Output on page 236](#)
- [Redundancy on page 236](#)

## Stratum 3 Clock Module

SCBE has a Stratum 3 centralized clock module that takes in synchronization sources on its reference input pins. When instructed by the clock selection algorithm, the clock module selects one of the reference inputs to lock its 19.44 MHz output clock. The MPCs select the chassis clock from the active SCBE to use it as a clock for their interface transmitters, thereby allowing the downstream routers to recover and synchronize to the chassis clock. A 20 MHz oscillator provides Stratum 3 free-run and holdover quality.

The clock module does not perform any automatic switching between the reference clocks, rather when Junos OS detects the loss of signal or clock, frequency inaccuracy, or phase irregularities, the clock module runs a clock selection algorithm and switches to the next highest-quality input reference.

The Stratum 3 clock modules—on the master and the backup SCBE—are cross-wired to eliminate any phase transients during SCBE switchover. The backup SCBE locks to the master's Stratum 3 clock module.

## BITS and GPS Support

[Table 48 on page 233](#) maps the Junos OS Release with the feature release of BITS and GPS on SCBE and SCBE2:

**Table 48: BITS and GPS Support on SCBE and SCBE2**

Feature	Switch Control Board	Junos OS Release
BITS	SCBE	12.3
GPS	SCBE	13.3
BITS	SCBE2	13.3

## External Clock Interface Input

BITS and GPS can be configured on the external clock interface on the SCBE.

The following sections explain external clock interface input for BITS and GPS:

- [External Clock Interface Input for BITS on page 234](#)
- [External Clock Interface Input for GPS on page 234](#)

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### External Clock Interface Input for BITS

When the BITS clock is qualified by the Stratum 3 clock module, it becomes a candidate clock source to the clock selection algorithm. BITS can simultaneously support both input and output clocking.

The external clock interface for BITS can recover:

- A framed 1.544 Mbps (T1) clock or a framed 2.048 Mbps (E1) clock. The T1/E1 framer supports sending and receiving of SSM quality levels through SA bits.
- An unframed 2048 kHz (G.703 T12) clock. You must configure an input SSM quality level when the external clock interface is configured for a signal type that does not support SSM, such as an unframed 2048 kHz (T12) clock, or a T1 superframe (T1 SF) clock.

On T1/T12 interfaces that do not support SSM, you must configure the SSM quality levels. On E1 interfaces, the Sa bits receive and transmit the SSM quality level.

Starting with 17.3R1, MX10003 router supports T1/E1 framed and 2.048MHz unframed clock input.

Starting with 17.4R1, MX204 router supports T1/E1 framed and 2.048MHz unframed clock input.

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### External Clock Interface Input for GPS

The GPS external clock interface supports:

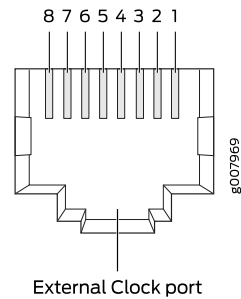
- 1 MHz, 5 MHz, and 10 MHz frequencies.
- Pulse per second (PPS) signals on BNC connectors—a special cable converts signals between the BNC connector and the RJ-45 port. These signals are fed into the Stratum 3 centralized clock module for qualification and monitoring. After qualification, the GPS source becomes a valid chassis clock source candidate.
- Time of day (TOD) over a serial link. Most GPS source TOD string formats are supported by Junos OS, thereby enabling you to configure a generic TOD format string. This format tells the Routing Engine how to interpret the incoming TOD character string.

You must also configure an input SSM quality level value, where the quality level is used by the chassis clock selection algorithm when the quality level mode is enabled.

For the GPS receiver to be qualified as a clock source, the frequency and the PPS signal from it must be qualified by the SCBE Stratum 3 module. The SCBE is synchronized with the GPS source TOD.

The 10MHz frequency and PPS are supported by an RJ-45 connector for SCBE/SCBE2. [Figure 4 on page 235](#) illustrates the actual pinout of the connector.

**Figure 4: RJ-45 Connector for SCBE/SCBE2**



**Table 49: RJ-45 Connector Pinout Information for SBE/SCBE2**

Pin	Signal
1	RX
2	RX
3	1 PPS GND
4	TX
5	TX
6	10 MHz GND
7	1 PPS
8	10 MHz



**NOTE:** Note that the GPS receiver is configured to support 10 MHz, 1 PPS, and TOD by default when it acts as a primary reference time clock.

Starting with 17.3R1, MX10003 router supports one GPS port per SPM which can be configured with 1MHz, 5MHz, and 10MHz frequencies and 1PPS signal.

Starting with 17.4R1, MX204 router supports GPS with 1MHz, 5MHz, and 10MHz frequencies and 1PPS signal.

## External Clock Interface Output

The external clock interface can be configured to drive BITS or GPS timing output (GPS timing output for frequency and PPS signal only). The BITS or GPS output is configured to select the output clock source but in the absence of an output configuration, the BITS or the GPS output is disabled. When the external clock interface is configured for output, it selects the clock source on the basis of the configured source mode.

Starting with Junos OS Release 14.1, the external clock interface can be configured to drive BITS timing output. When the external clock interface is configured as a BITS timing output, the following scenarios occur:

- The external clock interface drives the BITS timing output.

The chassis clock or the line clock are used as the source on the basis of the source mode configuration.

The best—configured—line source is transmitted out the BITS interface, when the output **source-mode** statement is configured as line.

The central clock module is set to holdover and the output is suppressed when the BITS output is configured and there are no valid clock sources available.

## Redundancy

On SCBE, the primary and the secondary SCBs monitor their respective clock sources, and the external clock interface source is accessible only to its local clocking hardware. Therefore, the clock signals cannot be routed between the primary and the secondary SCB. Redundancy is achieved after a Routing Engine switchover. When a switchover occurs, the new primary SCB reruns the clock selection algorithm after the configured switchover time expires to select a new clock source.

Starting with Junos OS Release 14.1, on SCBE2, simultaneous BITS/BITS redundancy can be achieved because the external interfaces for BITS on the primary SCB and the secondary SCB are wired. Note that BITS redundancy is achieved without a Routing Engine switchover on SCBE2.

The following scenarios are supported for BITS/BITS redundancy:

- You can configure both the external interfaces for BITS input as reference clocks. Therefore, on the basis of the configured clock quality, one of the BITS inputs is considered as a primary clock source and the other as a secondary clock source.
- When the signal from the primary BITS input stops or degrades, the secondary BITS input takes over as primary, thereby providing redundancy across BITS interfaces.

GRES is supported on MX240, MX480, and MX960 routers with SCBE2.

Release History Table

Release	Description
17.3	Starting with 17.3R1, MX10003 router supports T1/E1 framed and 2.048MHz unframed clock input.
17.3	Starting with 17.4R1, MX204 router supports T1/E1 framed and 2.048MHz unframed clock input.
17.3	Starting with 17.3R1, MX10003 router supports one GPS port per SPM which can be configured with 1MHz, 5MHz, and 10MHz frequencies and 1PPS signal.
17.3	Starting with 17.4R1, MX204 router supports GPS with 1MHz, 5MHz, and 10MHz frequencies and 1PPS signal.
14.1	Starting with Junos OS Release 14.1, the external clock interface can be configured to drive BITS timing output.
14.1	Starting with Junos OS Release 14.1, on SCBE2, simultaneous BITS/BITS redundancy can be achieved because the external interfaces for BITS on the primary SCB and the secondary SCB are wired.
12.1	Starting with Junos OS Release 12.2, the Enhanced SCB—SCBE—and from Junos OS Release 13.3, the Enhanced SCB—SCBE2—on the MX240, MX480, and MX960 routers support a Stratum 3 clock module that functions as a centralized point within the chassis for clock monitoring, filtering, holdover, and selection.

#### Related Documentation

- [Configuring Clock Synchronization Interface on MX Series Routers on page 293](#)
- [Example: Configuring Synchronous Ethernet on MX Series Routers on page 311](#)
- [Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 316](#)
- [request chassis synchronization mode on page 910](#)
- [show chassis synchronization \(MX Series Routers\) on page 2161](#)
- [synchronization on page 794](#)
- [Understanding Clock Synchronization on page 263](#)

## Ethernet Synchronization Message Channel Overview

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Ethernet Synchronization Message Channel (ESMC) is a logical communication channel. It transmits Synchronization Status Message (SSM) information, which is the quality level of the transmitting synchronous Ethernet equipment clock (EEC), by using ESMC protocol data units (PDUs). ESMC support is based on the ITU G.8264 specification.

Starting with Junos OS Release 17.3R1, Synchronized Ethernet with Ethernet synchronized Message Channel (ESMC) is supported on MX10003 routers

Starting with Junos OS Release 17.4R1, Synchronized Ethernet with Ethernet synchronized Message Channel (ESMC) is supported on MX204 routers

A Synchronous Ethernet interface is configured to operate in the following modes:

- Nonsynchronous mode—In this mode, the Synchronous Ethernet interface does not process the ESMC message and does not extract the quality level information.
- Synchronous mode—In this mode, the Synchronous Ethernet interface processes the ESMC message and extracts the quality level information. While operating in synchronous mode, the ESMC messages transmit the quality level.

You can enable ESMC on a Synchronous Ethernet port by adding the port to a list of ESMC interfaces. The ESMC messages are transmitted through the port indicating the quality level of the clock it is capable of driving and the ESMC messages are received (if the other endpoint supports ESMC) with the quality level of the transmitting clock. The MPC receiving the ESMC messages on its configured Synchronous Ethernet ports extracts the quality level and transmits it to the Routing Engine. The clock selection algorithm on the Routing Engine collects the ESMC data from each of the ESMC-enabled ports to select the clock sources.

The clock selection process supports revertive and nonrevertive modes. When the clock selection process has selected two clock sources—a primary and a secondary—and the active primary clock source degrades over a period of time and then improves again, this primary clock source again becomes the active clock source only if revertive mode is enabled. If nonrevertive mode is set and the secondary clock source is currently active (due to a previous degradation of primary clock source), the primary clock source is not reactivated even after its quality improves.

The clock selection is based on the following three operational modes:

- Forced free-run—In this mode, you can set the clock source either from a free-run local oscillator or from an external qualified clock. For MX80 routers, the free-run clock is provided by the local oscillator. For MX240, MX480, and MX960 routers, the free-run clock is provided by the Switching Control Board (SCB).
- Forced holdover—This mode is an internal state the synchronous Ethernet Equipment Clock (EEC) goes into, when an upstream clock source that the system locks on to is no longer available. You cannot configure this mode because it is an internal state.
- Automatic selection—In this mode, the system chooses up to two best upstream clock sources. The system then uses the clock recovered from one of the sources to generate



a frequency of 19.44 MHz and clock the transmit side of the Ethernet interfaces. If no upstream clock with acceptable good quality is available or if the system is configured in free-run mode, the system uses the internal clock. Automatic clock selection is based on the quality level, priority, signal fail, and external commands.

For more information about clock selection, see [“Configuring Clock Synchronization Interface on MX Series Routers” on page 293](#).

The synchronous EEC is in free-run mode when the chassis is switched on or restarted. When a synchronous EEC locks on to an upstream reference clock source at least once for a continuous period of 60 seconds, the EEC will have stored sufficient Synchronous Ethernet data in a replay holdover buffer. In case of failure of a reference clock source, the system goes to holdover mode and uses the replay data in the holdover buffer to service the downstream Synchronous Ethernet clients.

When a Modular Port Concentrator (MPC) with an EEC restarts (because of either a system crash or a manual restart), the holdover buffer data gets erased. Therefore, downstream Synchronous Ethernet clients cannot be serviced. This is also applicable when a new MPC containing an EEC is inserted into the system.

In a practical deployment scenario, the status display of holdover mode is invalid only when the chassis is switched on or restarted.

When an MPC containing an EEC is restarted or a new MPC containing an EEC is inserted into a system that is (already) in holdover mode, the EEC on this MPC cannot be considered to be in holdover mode because it does not have any Synchronous Ethernet replay information in its holdover data buffer. Therefore, you must first fix the system holdover issue before attempting to service the downstream Synchronous Ethernet clients on this MPC. To accomplish this, you must find a suitable upstream reference clock source and let the synchronous EEC lock on to this upstream reference clock source, and then service the downstream Synchronous Ethernet clients on this MPC.

**Release History Table**

Release	Description
17.3	Starting with Junos OS Release 17.3R1, Synchronized Ethernet with Ethernet synchronized Message Channel (ESMC) is supported on MX10003 routers
17.3	Starting with Junos OS Release 17.4R1, Synchronized Ethernet with Ethernet synchronized Message Channel (ESMC) is supported on MX204 routers

**Related Documentation**

- [Synchronous Ethernet Overview on page 242](#)
- [Configuring Clock Synchronization Interface on MX Series Routers on page 293](#)
- [Clock Sources for PTX Series Packet Transport Routers on page 306](#)
- [synchronization \(MX Series\) on page 794](#)
- [synchronization \(PTX Series\) on page 802](#)
- [request chassis synchronization mode on page 910](#)

- [show chassis synchronization on page 2153](#)
- [show chassis synchronization \(MX Series Routers\) on page 2161](#)

## Getting Started Configuring Clock Synchronization on PTX Series Routers

System clocking on PTX Series Packet Transport Routers is controlled by a Centralized Clock Generator (CCG). The CCG is capable of deriving a master clock from a valid source and synchronizing all interfaces on the chassis to this master clock.

To quickly access the information you need, click on the link in [Table 50 on page 240](#).

**Table 50: Locating the Information You Need to Configure Clock Synchronization on PTX Series Routers**

Task You Need to Perform	Where The Information Is Located
Configure a clock source.	<a href="#">“Synchronizing Internal Stratum 3 Clock to External Clock Sources on PTX Series Routers” on page 308</a> <a href="#">synchronization (PTX Series)</a>
Identify clock sources.	<a href="#">“Clock Sources for PTX Series Packet Transport Routers” on page 306</a>
Change the clock source.	<a href="#">request chassis synchronization switch</a>
Configure the clock source mode to be revertive or non revertive.	<a href="#">switchover-mode</a>
Verify the clock source is operational.	<a href="#">show chassis synchronization</a>

### Related Documentation

- [PTX5000 Centralized Clock Generator Description](#)
- [Connecting the PTX5000 to an External Clocking Device](#)
- [Understanding Clock Synchronization on page 263](#)

## Interface and Router Clock Sources Overview

- [Interface and Router Clock Sources Description on page 240](#)
- [Configuring an External Synchronization Interface on page 241](#)

### Interface and Router Clock Sources Description

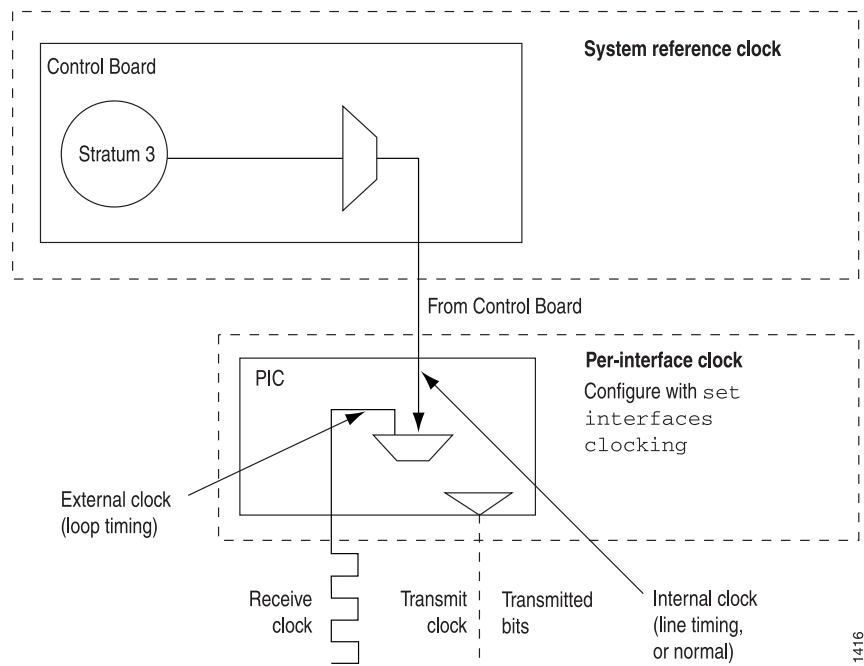
When configuring the router, you can configure the *transmit clock* on each interface; the transmit clock aligns each outgoing packet transmitted over the router's interfaces. For both the router and interfaces, the clock source can be the router's internal Stratum 3 clock, which resides on the control board, or an external clock that is received from the interface you are configuring. For example, interface A can transmit on interface A's received clock (external, loop timing) or the Stratum 3 clock (internal, line timing). Interface A cannot use a clock from any other source.

By default, each interface uses the router's internal Stratum 3 clock. To configure the clock source of each interface, include the **clocking** statement at the **[edit interfaces interface-name]** hierarchy level:

```
[edit interfaces interface-name]
clocking (internal | external);
```

System reference clocks can be generated from different system components, depending on the router type. For example, [Figure 5 on page 241](#) illustrates the different clock sources on the M120 router.

**Figure 5: M120 Router Clock Sources**



## Configuring an External Synchronization Interface

The M40e, M120, M320, T640, and T1600 routers support an external synchronization interface that can be configured to synchronize the internal Stratum 3 clock to an external source, and then synchronize the chassis interface clock to the external source.

This feature can be configured for external primary and secondary interfaces that use Building Integrated Timing System (BITS) or SDH Equipment Timing Source (SETS) timing sources. When internal timing is set for SONET/SDH, Plesiochronous Digital Hierarchy (PDH), and digital hierarchy (DS1) interfaces on the Physical Interface Cards (PICs), the transmit clock of the interface is synchronized to BITS/SETS timing and traceable to timing within the network.

To configure external synchronization on M40e, M120, M320, T640, and T1600 routers, include the **synchronization** statement at the **[edit chassis]** hierarchy level.

For more information about the external synchronization interface, see [“Configuring Junos OS to Support an External Clock Synchronization Interface for M Series, MX Series, and T Series Routers” on page 292](#).

**Related Documentation**

- [Configuring Junos OS to Support an External Clock Synchronization Interface for M Series, MX Series, and T Series Routers on page 292](#)
- [Synchronous Ethernet Overview on page 242](#)
- [Configuring Clock Synchronization Interface on MX Series Routers on page 293](#)

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## Synchronous Ethernet Overview

Synchronous Ethernet (ITU-T G.8261 and ITU-T G.8264) is a physical layer technology that functions regardless of the network load and supports hop-by-hop frequency transfer, where all interfaces on the trail must support Synchronous Ethernet. It enables you to deliver synchronization services that meet the requirements of the present-day mobile network, as well as future Long Term Evolution (LTE)–based infrastructures.

The following sections explain Synchronous Ethernet in detail:

- [Understanding Synchronous Ethernet on page 242](#)
- [Supported Platforms on page 243](#)
- [Understanding Synchronous Ethernet on the ACX Series Universal Metro Routers on page 247](#)
- [Understanding Clock Synchronization on page 247](#)
- [Understanding Ingress Monitoring on MX Series Routers on page 247](#)
- [Understanding Distributed Clocking Mode on MX Series Routers on page 248](#)
- [Centralized Clocking Mode Overview on page 248](#)

## Understanding Synchronous Ethernet

Synchronization is a key requirement for circuit (emulation) services and mobile radio access technologies. Traditionally, mobile networks used SONET/SDH technologies to backhaul voice and data traffic, and the native support for frequency of SONET/SDH to synchronize their radio network. With the need for greater-capacity backhaul networks, packet-based technologies such as Carrier Ethernet (which do not support the transfer of frequency) and wireless technologies such as frequency division duplex and time-division duplex require not only frequency synchronization but also proper time and phase alignment. This requirement is fulfilled by Synchronous Ethernet, which is used for physical layer frequency synchronization of connected access devices (such as base stations, access nodes, and so on). Synchronous Ethernet supports sourcing and transfer of frequency for synchronization purposes for both wireless and wireline services and is primarily used for mobile backhaul and converged transport.

Synchronous Ethernet is used to transfer clock signals over Ethernet interfaces. The Synchronous Ethernet operation is described in three ITU recommendations:

- G.8261—Defines the architecture and wander performance of Synchronous Ethernet networks.
- G.8262—Specifies timing characteristics of synchronous Ethernet equipment clock (EEC).
- G.8264—Describes the Ethernet Synchronization Message Channel (ESMC).

Synchronous Ethernet is not supported in the following instances on an MX Series router:

- Slot 10 on an MX Series router with Switch Control Board (SCB).
- RJ45 ports

However, note that Synchronous Ethernet is supported on slot 10 on an MX Series router with SCBE and SCBE2.



**NOTE:** Unified in-service software upgrade (unified ISSU) is currently not supported when clock synchronization is configured for Synchronous Ethernet on MX80 Universal Routing Platforms and on the MICs and MPCs on MX240, MX480, MX960, MX2010, and MX2020 routers.

## Supported Platforms

Table 51 on page 243 summarizes the first Junos OS release that supports Synchronous Ethernet on the various Juniper Networks routers and their components:

**Table 51: Synchronous Ethernet Support on Junos OS**

Routers and Components	First Supported Junos OS Release
MX5, MX10, MX40, and MX80 Universal Routing Platforms with model numbers MX5-T, MX10-T, MX40-T, and MX80-T	11.2R4
10-Gigabit Ethernet MPC with SFP+ transceivers	11.2R4
10-Gigabit Ethernet MIC with XFP in WAN-PHY framing mode	11.2R4
On MX240, MX480, and MX960 routers, the following Enhanced MPCs (MPCEs) support Synchronous Ethernet: <ul style="list-style-type: none"> <li>• MPC1E (MX-MPC1E-3D)</li> <li>• MPC1E Q (MX-MPC1E-3D-Q)</li> <li>• MPC2E (MX-MPC2E-3D)</li> <li>• MPC2E Q (MX-MPC2E-3D-Q)</li> <li>• MPC2E EQ (MX-MPC2E-3D-EQ)</li> </ul>	11.2R4
10-Gigabit Ethernet MIC with XFP in LAN-PHY framing mode	11.4

**Table 51: Synchronous Ethernet Support on Junos OS (continued)**

Routers and Components	First Supported Junos OS Release
Juniper Networks PTX Series Packet Transport Routers with 10-Gigabit Ethernet, 40-Gigabit Ethernet, and 100-Gigabit Ethernet interfaces	12.1
Juniper Networks ACX2000 Series Universal Metro Routers with Gigabit Ethernet and 10-Gigabit Ethernet SFP and SFP+ transceivers.	12.2
<b>On MX240, MX480, and MX960 routers with SCBE, the following MPCs support Synchronous Ethernet:</b>	
MPC-3D-16XGE-SFP	12.3
MPC4E-3D-32XGE-SFPP	15.1
MPC4E-3D-2CGE-8XGE	15.1
MX-MPC1-3D	12.3
MX-MPC1-3D-Q	12.3
MX-MPC2-3D	12.3
MX-MPC2-3D-Q	12.3
MX-MPC2-3D-EQ	12.3
MPC3E (MX-MPC3E-3D) on MX240, MX480, and MX960 routers	13.2
MX104 router	13.2R2
MX104 router	13.2R2
<b>On MX2010 and MX2020 routers, the following Enhanced MPCs (MPCEs) support Synchronous Ethernet:</b>	
<ul style="list-style-type: none"> <li>MPC1E (MX-MPC1E-3D)</li> <li>MPC1E Q (MX-MPC1E-3D-Q)</li> <li>MPC2E (MX-MPC2E-3D)</li> <li>MPC2E Q (MX-MPC2E-3D-Q)</li> <li>MPC2E EQ (MX-MPC2E-3D-EQ)</li> <li>MPC3E (MX-MPC3E-3D)</li> </ul>	13.3

Table 51: Synchronous Ethernet Support on Junos OS (continued)

Routers and Components	First Supported Junos OS Release
On MX240, MX480, and MX960 routers with SCBE2, and MX2010, MX2020 routers, the following MPCs support Synchronous Ethernet:	
MPC-3D-16XGE-SFP	13.3
MPC4E-3D-32XGE-SFPP	15.1
MPC4E-3D-2CGE-8XGE	15.1
MX-MPC1-3D	13.3
MX-MPC1-3D-Q	13.3
MX-MPC2-3D	13.3
MX-MPC2-3D-Q	13.3
MX-MPC2-3D-EQ	13.3
MPC7E-MRATE	16.1R1
MPC7E-10G	16.1R1
MX2K-MPC8E	16.1R1
MX2K-MPC9E	16.1R1
On MX240, MX480, and MX960 routers with SCBE or SCBE2, on MX2010 and on MX2020 routers with RE-CB, the following MPCs support Synchronous Ethernet:	
<ul style="list-style-type: none"> <li>MPC5E (MPC5E-40G10G)</li> <li>MPC5EQ (MPC5EQ-40G10G)</li> <li>MPC5E (MPC5E-100G10G)</li> <li>MPC5EQ (MPC5EQ-100G10G)</li> <li>MPC6E (MX2K-MPC6E)</li> </ul>	13.3R3
On PTX3000, the following third-generation FPCs support Synchronous Ethernet:	
<ul style="list-style-type: none"> <li>FPC3-SFF-PTX-U0</li> <li>FPC3-SFF-PTX-U1</li> </ul>	17.1R1



**NOTE:** Starting with Junos OS Release 12.1, Synchronous Ethernet is supported on Juniper Networks PTX Series Packet Transport Routers. On PTX Series routers, synchronous Ethernet is supported on 10-Gigabit Ethernet, 40-Gigabit Ethernet, and 100-Gigabit Ethernet interfaces and is compliant with ITU-T G.8261 and ITU-T G.8262 standards.



**NOTE:** Starting with Junos OS Release 14.2, Synchronous Ethernet supported on Juniper Networks PTX Series Packet Transport Routers is compliant with ITU-T G.8264 (Ethernet Synchronization Messaging Channel) standards.



**NOTE:** Starting with Junos OS Release 12.2, Synchronous Ethernet is supported on Juniper Networks ACX Series Universal Metro routers with Gigabit Ethernet and 10-Gigabit Ethernet SFP and SFP+ transceivers and is compliant with the ITU-T G.8261 and G.8264 standards.



**NOTE:** The 10-Gigabit Ethernet MIC with XFP supports Synchronous Ethernet, which requires both the MIC and the interface to be configured in LAN framing mode. In LAN mode, the LAN frequency is directly supplied by the MIC's on-board clocking circuitry.



**NOTE:** The 100-Gigabit Ethernet OTN MIC with CFP2 (MIC6-100G-CFP2) on MPC6E (MX2K-MPC6E) supports Synchronous Ethernet on 100-Gigabit Ethernet interfaces and is compliant with ITU-T G.872 standards. You can configure the primary and secondary clock sources on the 100-Gigabit Ethernet OTN MIC. Chassis line cards can be configured to recover network timing clocks at the physical layer via Synchronous Ethernet. The 100-Gigabit Ethernet OTN MIC supports recovery of clocks via the OTN overhead bytes and not from the configured clock sources.



**NOTE:** Starting with Junos OS Release 17.3, Synchronous Ethernet supported on fixed port PIC ( 6xQSFP) and modular MIC (JNP-MIC1) on MX10003 routers is compliant with ITU-T G.8264 (Ethernet Synchronization Messaging Channel) standards.

Starting with Junos OS Release 17.4, Synchronous Ethernet supported on the fixed port PICs (4xQSFP28 PIC and 8xSFPP PIC) on MX204 routers is compliant with ITU-T G.8264 (Ethernet Synchronization Messaging Channel) standards.



## Understanding Synchronous Ethernet on the ACX Series Universal Metro Routers

Synchronous Ethernet is supported on the ACX Series routers with Gigabit Ethernet and 10-Gigabit Ethernet SFP and SFP+ transceivers and is compliant with ITU-T Recommendation G.8261: *Timing and synchronization aspects in packet networks* and ITU-T Recommendation G.8264: *Distribution of timing through packet networks*. Synchronous Ethernet is a physical layer frequency transfer technology modeled after synchronization in SONET/SDH. Traditional Ethernet nodes, which do not support Synchronous Ethernet, do not carry synchronization from one node link to another. Synchronous Ethernet-capable nodes however can synchronize their chassis clock to a clock recovered from an interface connected to an upstream clock master. After this, the clock is used to time data sent to downstream clock slaves, forming a synchronization trail from a Primary Reference Clock (PRC) to Ethernet equipment clocks (EECs) and transferring frequency synchronization along the trail.

The ITU-T G.8264 specification defines the Synchronization Status Message (SSM) protocol and its format for Synchronous Ethernet to ensure interoperability between Synchronous Ethernet equipment used for frequency transfer—for example, SONET/SDH. Synchronous Ethernet provides stable frequency synchronization to a PRC and is not affected by load on the network. However, it requires that all the nodes from the PRC to the last downstream node are Synchronous Ethernet capable. Synchronous Ethernet is a recommended technology for mobile networks that require frequency-only synchronization—for example, 2G or 3G base stations.

## Understanding Clock Synchronization

MX Series and PTX Series routers support external clock synchronization and automatic clock selection for Synchronous Ethernet and external inputs (T1 or E1 line timing sources).

Configuring external clock synchronization and automatic clock selection requires making clock selection, quality level, and priority considerations. The clock source selection algorithm is used to pick the two best upstream clock sources from among the various sources on the basis of system configuration and execution criteria such as quality level, priority, and hardware restrictions.

You can configure several options for external clock synchronization. For an overview about the configuration options, see [“Configuring Clock Synchronization Interface on MX Series Routers” on page 293](#) and for information about configuring these options for MX Series routers, see [“Understanding Clock Synchronization” on page 263](#).

Currently, two types of clocking modes are supported on MX Series routers, the distributed clocking mode and the centralized clocking mode. For information about distributed clocking mode, see [“Understanding Distributed Clocking Mode on MX Series Routers” on page 248](#) and [“Ethernet Synchronization Message Channel Overview” on page 238](#). For information about centralized clocking mode, see [“Centralized Clocking Mode Overview” on page 248](#) and [“Centralized Clocking Overview” on page 232](#).

## Understanding Ingress Monitoring on MX Series Routers

The ingress clock monitoring feature is supported on all MX Series routers including the 16-port 10-Gigabit Ethernet MPC. On these routers, the incoming Synchronous Ethernet

signals cannot be monitored on the 16-port 10-Gigabit Ethernet MPC but are monitored by other Modular Port Concentrators (MPCs) in the chassis. Therefore, you can use the 16-port 10-Gigabit Ethernet MPC for incoming Synchronous Ethernet signals if at least one other MPC with an Ethernet Equipment Clock (EEC) is present in the chassis. This behavior is referred to as *ingress clock monitoring*. Note that the 16-port 10-Gigabit Ethernet MPC does not have a built-in EEC or internal clock; therefore, it can only input (accept) a clock signal but cannot act as a clock source.

When an MX Series router is configured for Synchronous Ethernet on the 16-port 10-Gigabit Ethernet MPC and no other MPC with an EEC is present in the chassis, the Synchronous Ethernet feature cannot be supported by the system. The system notifies the user through log messages and CLI output and justifies its inability to support Synchronous Ethernet.

For information about Synchronous Ethernet support on the 10-Gigabit Ethernet MIC, see [“Synchronous Ethernet on 10-Gigabit Ethernet MIC Overview” on page 252](#).

## Understanding Distributed Clocking Mode on MX Series Routers

In the distributing clocking mode, the Switch Control Board (SCB) supports synchronizing the MX Series router's chassis to an internal Stratum 3 free-run oscillator. The Synchronous Ethernet timing messages are sent through the chassis to support the network timing trails that are traceable to a high-quality timing source. The timing messages are carried through the network by the Ethernet switches that were traditionally handled by time-division multiplexing (TDM) equipment over SONET/SDH interfaces. The distributing clocking mode is handled through ESMC messages. The ESMC support is based on the ITU-G.8264 specification. The ESMC messages transmit the clock quality of the line timing signal in the form of the (Synchronous Status Message) SSM TLV that is carried in the ESMC packet. For more information, see [“Ethernet Synchronization Message Channel Overview” on page 238](#).

The distributed clocking mode has the following limitations:

- There is no SCB centralized clock module to synchronize the entire chassis.
- The recovered line timing is driven out only by the line interface of the 16-port 10-Gigabit Ethernet MPC.
- The distributed mode does not support external clock interface timing.

Centralized clocking mode overcomes these limitations by distributing and driving timing out on all the chassis line interfaces.

## Centralized Clocking Mode Overview

Starting with Junos OS Release 12.2, the Enhanced SCB SCBE on the MX240, MX480, and MX960 routers supports a Stratum 3 clock module. This clock module functions as a centralized point within the chassis for clock monitoring, filtering, holdover, and selection. It has only one external clock interface. For more information, see [“Centralized Clocking Overview” on page 232](#).

Starting from Junos OS Release 13.3, the Enhanced SCB SCBE2 on the MX240, MX480, and MX960 routers supports two external clock interfaces external-0/0 and external-1/0.

The external-0/0 interface refers to the external interface on the SCB in slot 0 and the external 1/0 interface refers to the external interface on the SCB in slot 1.

In SONET/SDH networks, the routers use the best-quality clock available in the network. The quality level of various clock sources in the network is determined by monitoring the Synchronization Status Messages (SSMs) from the clock sources. An SSM occupies a fixed location in the SONET frame. On Ethernet networks that use Synchronous Ethernet for clock synchronization, the SSM is not a part of the timing signal. The SSM is carried in the Ethernet packets that flow in the Ethernet Synchronization Message Channel (ESMC). By interpreting the SSM values, the router determines the clock quality associated with the clock source, and performs its clock selection accordingly. The ESMC messages transmit the clock quality of the line timing signal in the form of the SSM TLV that is part of the ESMC packet.

Note that the clock in the router goes into holdover mode in the absence of any clock sources with best quality level and in turn uses the timing information stored in its buffer to synchronize itself.

The following processes play a crucial role during external synchronization of the clock sources in the control board. Note that PTX Series routers need two best clock sources that act as primary and secondary clock sources, whereas MX Series routers need only one best clock source.

- The clock sync process (clksyncd) performs the clock selection and participates in ESMC message exchange. For clock selection, in the absence of user-configured primary or secondary clock sources, the clksyncd runs a clock selection algorithm and selects the two best clocks available as the primary and secondary clock sources, respectively, for a PTX Series router or selects a best clock for an MX Series router. The clksyncd also sends out periodic ESMC packets to transmit its clock's quality level to the other routers in the network—this is specified in the SSM TLV in the ESMC packet—and receives ESMC packets from other clock sources and tracks the received clock signal quality level. ESMC packets are received on all the interfaces that are configured as clock sources. ESMC packets are also transmitted to the clock-source interfaces on other routers, as well as to the interfaces that are configured to receive ESMC packets on other routers.
- The chassis process (chassisd) is responsible for interfacing with the Enhanced Switch Control Board (SCBE) on MX Series routers and Centralized Clock Generator (CCG) on PTX Series routers. It monitors the clock quality and assists SCBE or the CCG to determine the clock source with the best quality level. When it detects clock quality deterioration, it informs clksyncd to select another primary clock source. After clock selection chassisd is updated with the latest clock source information. Note that in the absence of user-configured primary and secondary clock sources on PTX Series routers, the clock sources are selected through the clock algorithm and chassisd is updated with the latest clock information. Consequently, a new interprocess connection is established between chassisd and clksyncd.
- The periodic packet management process (ppmd) performs periodic transmission of ESMC packets to other routers in the network. It also receives incoming ESMC packets from other routers. The ppmd filters out repetitive ESMC packets to reduce packet flows between ppmd and clksyncd.

The following explains a simple clock selection process using ESMC packets:

- The Synchronous Ethernet (line timing) signal is an Ethernet physical layer signal that is received on the Ethernet interface. ESMC is a Layer 2 Ethernet packet. The Synchronous Ethernet signal and the ESMC packets are received on the Ethernet interface of the router.
- The received Synchronous Ethernet signal is sent to the clock hardware in the SCBE or in the CCG, whereas the ESMC packets—with the quality level—is directed to the `clksyncd`.
- The clock selection algorithm in `clksyncd` selects the best clock signal based on the quality level in the ESMC packet from one of the interfaces that is configured as a clock source. On PTX Series routers, the algorithm also selects the next best—when available—clock as the secondary clock.
- The best clock information is transmitted to the `chassisd`, which in turn generates a command to the clock hardware to use the best clock as the reference clock. On PTX Series routers, both primary and secondary clocks are used..
- The reference clock uses the best—primary in PTX Series routers—clock signal as the system clock that is used to generate Synchronous Ethernet signal to transmit on all its interfaces.
- The ESMC transmit module in `clksyncd` is notified of the quality level corresponding to the best—primary—clock. This quality level is used for ESMC packets that are transmitted out of the router.
- ESMC packets are transmitted on all the source interfaces and on those interfaces that are configured as `esmc-transmit` interfaces.



**NOTE:** On SCBE2, you can configure the external synchronization options only on the external interface on the active SCB. Therefore, if the active SCB is in slot 0, then you can configure the external-0/0 interface only. If the active SCB is in slot 1, then you can configure the external-1/0 interface only.

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The centralized mode is applicable to mobile backhaul infrastructures and for network transition from traditional TDM to Ethernet network elements with the support of Synchronous Ethernet.

Release History Table

Release	Description
17.3	Starting with Junos OS Release 17.3, Synchronous Ethernet supported on fixed port PIC ( 6xQSFP) and modular MIC (JNP-MIC1) on MX10003 routers is compliant with ITU-T G.8264 (Ethernet Synchronization Messaging Channel) standards.
17.3	Starting with Junos OS Release 17.4, Synchronous Ethernet supported on the fixed port PICs (4xQSFP28 PIC and 8xSFPP PIC) on MX204 routers is compliant with ITU-T G.8264 (Ethernet Synchronization Messaging Channel) standards.
14.2	Starting with Junos OS Release 14.2, Synchronous Ethernet supported on Juniper Networks PTX Series Packet Transport Routers is compliant with ITU-T G.8264 (Ethernet Synchronization Messaging Channel) standards.
13.3	Starting from Junos OS Release 13.3, the Enhanced SCB SCBE2 on the MX240, MX480, and MX960 routers supports two external clock interfaces external-0/0 and external-1/0.
12.2	Starting with Junos OS Release 12.2, Synchronous Ethernet is supported on Juniper Networks ACX Series Universal Metro routers with Gigabit Ethernet and 10-Gigabit Ethernet SFP and SFP+ transceivers and is compliant with the ITU-T G.8261 and G.8264 standards.
12.2	Starting with Junos OS Release 12.2, the Enhanced SCB SCBE on the MX240, MX480, and MX960 routers supports a Stratum 3 clock module.
12.1	Starting with Junos OS Release 12.1, Synchronous Ethernet is supported on Juniper Networks PTX Series Packet Transport Routers.

#### Related Documentation

- [Clock Sources for PTX Series Packet Transport Routers on page 306](#)
- [Configuring Clock Synchronization Interface on MX Series Routers on page 293](#)
- [Configuring External Clock Synchronization for ACX Series Routers](#)
- [Ethernet Synchronization Message Channel Overview on page 238](#)
- [request chassis synchronization mode on page 910](#)
- [show chassis synchronization \(MX Series Routers\) on page 2161](#)
- [Synchronous Ethernet on 10-Gigabit Ethernet MIC Overview on page 252](#)
- [synchronization \(MX Series\) on page 794](#)
- [synchronization \(PTX Series\) on page 802](#)

## Synchronous Ethernet on 10-Gigabit Ethernet MIC Overview

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Synchronous Ethernet (ITU-T G.8261) is a physical layer technology that functions regardless of the network load. Synchronous Ethernet supports hop-by-hop frequency transfer, where all interfaces on the trail must support Synchronous Ethernet.

Starting with Junos OS Release 11.4, the 10-Gigabit Ethernet MIC with XFP supports Synchronous Ethernet in LAN-PHY framing mode. This is possible only when all the Physical Interface Cards (PICs) under the given Modular Interface Card (MIC) and its ingress interfaces are configured in LAN framing mode. For more information about configuring LAN framing mode, see [“Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC” on page 316](#). In this mode, the LAN frequency is directly supplied by the MIC's on-board clocking circuitry.

On MX80 Universal Routing Platforms, when the PIC-level framing type is changed, the pluggable MIC (2-port 10-Gigabit Ethernet MIC with XFP) is restarted and the Forwarding Engine Board with the built-in MIC (4-port 10-Gigabit Ethernet MIC with XFP) is restarted.

On MX240, MX480, and MX960 routers, when the PIC-level framing type is changed from LAN mode to non-LAN mode (on a MIC), the entire MPC restarts.



**NOTE:** The default interface framing mode is LAN-PHY framing mode. For WAN-PHY framing mode operation, interface framing needs to be set to the wan-phy framing option explicitly. For more information about the interface-level and PIC-level configuration combination, see [“Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC” on page 316](#).

Synchronous Ethernet is not supported in the following instances:

- MX240, MX480, and MX960 routers with 10-Gigabit Ethernet MICs or 10-Gigabit Ethernet built-in interfaces do not support Synchronous Ethernet or Ethernet Synchronization Message Channel (ESMC) transmit in LAN physical layer device (LAN-PHY) framing mode. To configure Synchronous Ethernet or ESMC transmit interfaces on these routers with 10-Gigabit Ethernet Interfaces, you must configure all the 10-Gigabit Ethernet interfaces on the MIC in WAN physical layer device (WAN PHY) framing mode.
- Primary and secondary sources cannot be from the same MIC. Alternatively, only the port with the highest quality clock source from a given MIC is used for clock selection.
- Starting with Junos OS Release 11.4, Synchronous Ethernet is not supported on 10-Gigabit Ethernet ports in LAN-PHY mode except for the 10-Gigabit Ethernet MIC with XFP.
- Prior to Junos OS Release 11.4, Synchronous Ethernet was supported only in WAN-PHY framing mode on the 10-Gigabit Ethernet MICs with XFP.

**NOTE:**

On the MX Series 5G Universal Routing Platforms, the placement of MICs varies from router to router, the following key points has to be taken into consideration while configuring the MICs:

- On the fixed MX80 chassis, the MICs (10-Gigabit Ethernet MIC) come preinstalled and cannot be replaced. The MIC is labeled as 0/MIC 0 and it consists of four 10-Gigabit Ethernet ports labeled 0 through 3, left to right.
- On the modular MX5, MX10, MX40, and MX80 chassis, there are two MIC slots that are labeled as 1/MIC 0 and 1/MIC 1.
- On the MX240, MX480, and MX960 Universal Routing Platforms, there are two slots for MICs which are labeled as PIC 0/1 and PIC 2/3 on the Modular Port Concentrators (MPCs).

Note that hereon the term *PIC* is being used in synonymous with the term *MIC slot* or *Ethernet ports* (in the case of fixed MX80 chassis).

You can configure a MIC in LAN-PHY framing mode by configuring all the constituent logical PICs in the same LAN-PHY framing mode on MX80, MX240, MX480, and MX960 routers.

You can also alternatively configure a MIC in WAN-PHY framing mode on MX80, MX240, MX480, and MX960 routers by configuring all the constituent logical PICs in the same WAN-PHY framing mode in any one of the following configurations:

- No framing mode configured on all the constituent logical PICs of the MIC.
- Incompatible framing mode configured on constituent logical PICs of the MIC.
- No framing mode configured on some of the constituent logical PICs of the MIC.



**NOTE:** All the logical PICs in a single MIC must be configured in the same framing mode.

You can also configure the framing mode at the interface level and at the PIC level. For more information about configuring the framing mode at the PIC level and at the interface level, see [“Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC” on page 316.](#)

When the PIC-level framing type is changed between LAN mode and non-LAN mode on a MIC:

- The Forwarding Engine Board (FEB) is restarted in the case of the built-in MIC (4-port 10-Gigabit Ethernet MIC with XFP) on MX80 routers.
- Only the corresponding MIC is restarted in the case of the pluggable MIC (2-port 10-Gigabit Ethernet MIC with XFP) on MX80 routers.

- The entire MPC restarts in the case of MX240, MX480, and MX960 routers.



**NOTE:** By default, the PIC-level framing mode is set to WAN framing type, that is, `e1 | e3 | sdh | sonet | t1 | t3`. Synchronous Ethernet works on the 10-Gigabit Ethernet MIC with XFP in LAN-PHY mode only when the PIC-level framing configuration is configured to the `lan` framing type explicitly.

By default, the interface-level framing mode is set to `lan-phy`. For WAN-PHY operation, interface framing needs to be set to `wan-phy` framing explicitly.

Table 52 on page 254 summarizes the possible configuration combination for Synchronous Ethernet on the 10-Gigabit Ethernet MIC with XFP that are available at the interface level and the PIC level:

**Table 52: Configuration Options**

Framing Configuration		Operation		
PIC Level	Interface Level	Interface Status	Will Synchronous Ethernet Function?	Will Non-Synchronous Ethernet Functions Work?
LAN	LAN-PHY (Default)	Up	Yes	Yes
LAN	WAN-PHY	Down (Framing Conflict)	No	No
WAN (Default)	LAN-PHY (Default)	Up	No	Yes
WAN (Default)	WAN-PHY	Up	Yes	Yes

The following cases and corresponding behaviors explain Table 52 on page 254 in detail.

- The PIC is being brought up online:

This case is applicable when either the MIC is restarted or when the MIC is being brought online by an operational command. In this case, the behavior can be presented as:

- No framing mode is configured for any or all of the constituent logical PICs of the MIC—The MIC is configured to operate in WAN-PHY framing mode as the WAN mode is the default mode.

Here, the WAN-PHY framing-based interfaces operate in normal state and provides Synchronous Ethernet services. However, the LAN-PHY framing-based interfaces operate normally but cannot provide Synchronous Ethernet services.

- All the constituent logical PICs of a MIC are configured in LAN-PHY mode—The MIC is configured to operate in LAN-PHY framing mode.



In this scenario, the WAN-PHY framing-based interfaces cannot operate in normal state. As a result, these interfaces are administratively brought down. The reason for the interface being in **admin-down** state is displayed as **Framing Conflict** in the output of the **show interfaces** operational command. This is because the interface framing configuration (WAN-PHY) is in conflict with the PIC-level framing configuration of LAN-PHY. Because the interfaces are in **admin-down** state, neither the Synchronous Ethernet services nor other services are provided.

Alternatively, all the LAN-PHY framing-based interfaces can operate in normal state and can continue to provide any of the Synchronous Ethernet services.

- The PIC is already online:
  - In WAN-PHY framing mode—The interface framing configuration on the PIC has changed from WAN-PHY to LAN-PHY.  
The interface continues to be operational for data transceiving purposes. However, it cannot provide any of the Synchronous Ethernet services.
  - In WAN-PHY framing mode—The interface framing configuration on the PIC has changed from LAN-PHY to WAN-PHY.  
The interface continues to be operational for data transceiving purposes, and it can also provide Synchronous Ethernet services.
  - In LAN-PHY framing mode—The interface framing configuration on the PIC has changed from WAN-PHY to LAN-PHY.  
The interface is operational for data transceiving purposes, and it can also provide Synchronous Ethernet services.
  - In LAN-PHY framing mode—The interface framing configuration on the PIC has changed from LAN-PHY to WAN-PHY.  
The interface is down; therefore, it cannot provide any Synchronous Ethernet services.

Support for Synchronous Ethernet is limited in the following instances:

- Primary and secondary sources cannot be from the same MIC. Alternatively, only the port with the highest quality clock source from a given MIC is used for clock selection.
- Prior to Junos OS Release 11.4, Synchronous Ethernet was supported only in WAN-PHY framing mode on the 10-Gigabit Ethernet MICs with XFP.

#### Related Documentation

- [Clock Sources for PTX Series Packet Transport Routers on page 306](#)
- [Configuring Clock Synchronization Interface on MX Series Routers on page 293](#)
- [Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 316](#)
- [request chassis synchronization mode on page 910](#)
- [show chassis synchronization \(MX Series Routers\) on page 2161](#)
- [Synchronous Ethernet Overview on page 242](#)

- [synchronization on page 794](#)

## Precision Time Protocol Overview

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Increase in bandwidth requirements on wireless backhaul networks and the need to reduce costs and to improve flexibility have triggered the need for a packet-based backhaul infrastructure. Traditional metro deployments do not cater to the delivery of synchronization services, and this leaves operators with no other choice than to keep older parallel infrastructure. Physical layer-based Synchronous Ethernet and packet-based Precision Time Protocol (PTP) enable routers and switches to deliver synchronization services that meet the requirements of today's mobile network, as well as Long Term Evolution (LTE)-based infrastructures. Physical layer-based technologies function regardless of network load, whereas packet-based technologies require careful architecture and capacity planning. For information about Synchronous Ethernet, see ["Synchronous Ethernet Overview" on page 242](#).

PTP, also known as IEEE 1588v2, is a packet-based technology that enables the operator to deliver synchronization services on packet-based mobile backhaul networks. IEEE 1588 PTP (Version 2) clock synchronization standard is a highly precise protocol for time synchronization that synchronizes clocks in a distributed system. The time synchronization is achieved through packets that are transmitted and received in a session between a master clock and a slave clock.

The system clocks can be categorized based on the role of the node in the network. They are broadly categorized into ordinary clocks and boundary clocks. The master clock and the slave clock are known as ordinary clocks. The boundary clock can operate as either a master clock or a slave clock. The following list explains these clocks in detail:

- Master clock—The master clock transmits the messages to the PTP clients (also called slave node or boundary node). This allows the clients to establish their relative time distance and offset from the master clock (which is the reference point) for phase synchronization. Delivery mechanism to the clients is either unicast or multicast packets over Ethernet or UDP.
- Slave clock—Located in the PTP client (also called slave or slave node), the slave clock performs clock and time recovery operations based on the received and requested timestamps from the master clock.
- Boundary clock—The boundary clock operates as a combination of the master and slave clocks. The boundary clock endpoint acts as a slave clock to the master clock, and also acts as the master to all the slaves reporting to the boundary endpoint.

For more information about configuring PTP, see ["Configuring Precision Time Protocol" on page 319](#) and ["Example: Configuring Precision Time Protocol" on page 325](#).

[Table 53 on page 257](#) summarizes the first Junos OS release that supports PTP on various Juniper Networks devices:

**Table 53: Precision Time Protocol Support**

Juniper Networks Devices	Junos OS Release
MX80 Universal Routing Platforms with model number MX80-P	12.2
MX-MPC2E-3D-P (MPC2E P) on MX240, MX480, and MX960 routers	12.2
MX-MPC2E-3D-P (MPC2E P) on MX2010 and MX2020 routers	12.3
MPC4E-3D-32XGE-SFPP on MX240, MX480, MX960, MX2010, MX2020	15.1R1
MPC4E-3D-2CGE-8XGE on MX240, MX480, MX960, MX2010, MX2020	15.1R1
MPC3E-3D-NG-Q on MX240, MX480, MX960, MX2010, MX2020	15.1R2
MPC3E-3D-NG on MX240, MX480, MX960, MX2010, MX2020	15.1R2
Following enhanced MPCs support PTP (1588v2): <ul style="list-style-type: none"> <li>• MPC5E-40G10G on MX240, MX480, MX960, MX2010, and MX2020 routers</li> <li>• MPC5EQ-40G10G on MX240, MX480, MX960, MX2010, and MX2020 routers</li> <li>• MPC5E-100G10G on MX240, MX480, MX960, MX2010, and MX2020 routers</li> <li>• MPC5EQ-100G10G on MX240, MX480, MX960, MX2010, and MX2020 routers</li> <li>• MX2K-MPC6E on MX2010, and MX2020 routers</li> </ul>	14.2R2
Ethernet Modular Interface Cards (MICs) on MX240, MX480, and MX960 routers	12.2
Ethernet Modular Interface Cards (MICs) on MX2010 and MX2020 routers	12.3
On MX240, MX480, MX960, MX2010, and MX2020 routers, the following Enhanced MPCs (MPCes) support PTP (1588v2) under express licensing only: <ul style="list-style-type: none"> <li>• MPC1E (MX-MPC1E-3D)</li> <li>• MPC1E Q (MX-MPC1E-3D-Q)</li> <li>• MPC2E (MX-MPC2E-3D)</li> <li>• MPC2E Q (MX-MPC2E-3D-Q)</li> <li>• MPC2E EQ (MX-MPC2E-3D-EQ)</li> </ul> For more information about obtaining a license, contact JTAC.	12.3
ACX Series Universal Metro Routers	12.2
MPC6E, MPC7E, MPC8E, MPC9E, MPC2E NG, and MPC3E NG on MX2008.	17.2

Table 53: Precision Time Protocol Support (continued)

Juniper Networks Devices	Junos OS Release
Fixed port PIC (6xQSFP) and modular MIC (JNP-MIC1) on MX10003 routers	17.3
Fixed port PICs (4xQSFP28 and 8xSFPP) on MX204 routers	17.4
MPC7E-10G and MPC7E-MRATE on MX240, MX480, MX960, MX2010, MX2020	17.4
MPC8E and MPC9E on MX2010, MX2020	17.4

You can configure timestamping either at the physical layer or at the nonphysical layer on the 10-Gigabit Ethernet and 100-Gigabit Ethernet ports. Juniper Networks recommends that you configure timestamping at the physical layer if the port supports IEEE 1588 timestamping, which is also known as *PHY timestamping*.



## NOTE:

- On 10-Gigabit Ethernet ports, PHY timestamping and WAN-PHY framing are mutually exclusive—that is, you cannot configure PHY timestamping on 10-Gigabit Ethernet ports if you have configured WAN-PHY framing mode on the port. This is applicable only for MPC5E and MPC6E with 24x10XGE MIC.
- PHY timestamping is *not* supported on the enhanced MPCs MPC1E, MPC2E, and MPC4E. Only hardware timestamping is supported on these MPCs. Therefore, a packet delay variation (also known as jitter) of up to 1 microsecond is observed on these MPCs for a very small percentage of packets occasionally.
- Unified in-service software upgrade (unified ISSU) is currently not supported when clock synchronization is configured for PTP on the MICs and Enhanced MPCs on MX240, MX480, MX960, MX2010, and MX2020 routers.
- To switch between the PTP and Synchronous Ethernet modes, you must first deactivate the configuration for the current mode and then commit the configuration. Wait for a short period of 30 seconds, configure the new mode and its related parameters, and then commit the configuration.

## G.8275.1 Telecom Profile

Profiles were introduced in IEEE 1588-2008 to define a combination of options and attribute values, aimed at supporting a given application. G.8275.1 is a PTP profile for telecom applications requiring accurate phase and time synchronization. It supports the architecture defined in ITU-T G.8275 to enable the distribution of phase and time with full timing support and is based on the second version of PTP defined in [IEEE 1588].



**NOTE:** ACX Series routers do not support G.8275.1 Telecom Profile.

The following sections give a brief overview about the types of clocks supported in the G.8275.1 profile and about the Alternate BMCA:

- [Types of Clocks Supported in the G.8275.1 Profile on page 259](#)
- [Alternate BMCA on page 259](#)

### Types of Clocks Supported in the G.8275.1 Profile

There are two types of clocks supported in this profile, the ordinary clock and the boundary clock.

There are two types of ordinary clocks:

- One that can be only a grandmaster clock (T-GM)
- One that can be only a slave clock (a slave-only ordinary clock or T-TSC)

There are two types of boundary clocks:

- One that can be only a grandmaster clock (T-GM)
- One that can become a master clock and a slave clock to another PTP clock (T-BC)



**NOTE:** MX Series routers support the TSC and TBC clock types.

### Alternate BMCA

The G.8275.1 profile uses an alternate Best Master Clock Algorithm (BMCA). The alternate BMCA allows:

- A new per-port attribute named **notSlave**. The **notSlave** port attribute is implemented using the **protocols ptp master** stanza configuration.
- Multiple active grandmasters.
- Per-port attribute **local-priority** to be used as a tie-breaker in the dataset comparison algorithm.

## PTP over Link Aggregation Group

Junos Supports PTP over LAG based on the recommendation in ITU-T-G.8275.1. For each aggregated Ethernet link configured as PTP master or slave, you can specify one member link of the aggregated Ethernet bundle as primary and another as secondary. PTP switches over to the secondary member in the aggregated Ethernet bundle when the primary aggregated Ethernet link is down. For providing both link-level and FPC-level redundancy, the primary and secondary interfaces of the aggregated Ethernet bundle must be configured on separate line cards. If both primary and secondary are configured on the same line card, it would provide only link-level redundancy.

PTP master streams are created on the FPC on which the primary interface is present. Announce and sync packets are transmitted on this active PTP aggregated Ethernet link. The line card on the PTP slave containing this active PTP aggregated Ethernet link will receive announce and sync packets from the remote master.

This table summarizes the first Junos OS release that supports PTP over LAG on various Juniper Networks devices:

**Table 54: PTP over LAG Support**

Juniper Network Devices	PTP over IPv4	PTP over Ethernet
MPC2E NG	17.2R1	–
MPC3E NG	17.2R1	–
MPC5E	17.2R1	18.2R1
MPC6E	17.2R1	18.2R1
MPC7E-10G	18.1R1	18.3R1
MPC7E-MRATE	18.1R1	18.3R1
MPC8E	18.1R1	18.3R1
MPC9E	18.1R1	18.3R1

- Related Documentation**
- [Configuring Precision Time Protocol on page 319](#)
  - [Example: Configuring Precision Time Protocol on page 325](#)
  - *IEEE 1588v2 Precision Timing Protocol (PTP)*

## Configuring G.8275.1 Profile

You can configure the G.8275.1 PTP profile for applications requiring accurate phase and time synchronization. It supports the architecture defined in ITU-T G.8275 to enable the distribution of phase and time with full timing support and is based on the second version of PTP defined in [IEEE 1588].

To configure the G.8275.1 profile:

1. In configuration mode, go to the **[edit protocols ptp]** hierarchy level:

```
[edit]
user@host# edit protocols ptp
```

2. Configure the G.8275.1 profile.

```
[edit protocols ptp]
user@host# set profile-type g.8275.1
```

3. Configure the clock mode as either boundary or ordinary.

The **boundary** option signifies that the clock can be both a master clock and a slave clock. The **ordinary** option signifies that the clock is either a master clock or a slave clock.

```
[edit protocols ptp]
user@host# set clock-mode (boundary | ordinary)
```

4. Configure the PTP domain option with values from 24 through 43. The default value is 24.

```
[edit protocols ptp]
user@host# set domain domain-value
```

5. Configure the **priority2** option with values from 0 through 255. The default value is 128.

The **priority2** value differentiates and prioritizes the master clock to avoid confusion when **priority1-value** is the same for different master clocks in a network.

```
[edit protocols ptp]
user@host# set priority2 priority2-value
```

6. Configure stateful interface for boundary clock mode of operation.

```
[edit protocols ptp stateful]
user@host# edit interface interface-name
```



**NOTE:** For the configuration to work, the interface you specify must be configured at the [edit interfaces *interface-name*] hierarchy level.

7. Configure multicast transmission of Precision Time Protocol (PTP) packets.

```
[edit protocols ptp stateful interface interface-name]
user@host# set multicast-mode
```

8. Configure the **local-priority** option. This attribute to be used as a tie-breaker in the dataset comparison algorithm, in the event that all other previous attributes of the datasets being compared are equal.

```
[edit protocols ptp stateful interface interface-name multicast-mode]
```

```
user@host# set local-priority local priority-value
```

9. Specify the encapsulation type for PTP packet transport as Ethernet or IEEE 802.3.

```
[edit protocols ptp stateful interface interface-name multicast-mode]  
user@host# set transport ieee-802.3
```

10. Specify the asymmetry value.

```
[edit protocols ptp stateful interface interface-name multicast-mode]  
user@host# set asymmetry asymmetry value
```

After you have configured the PTP G.8275.1 profile, enter the **commit** command from configuration mode.

**Related  
Documentation**

- [Precision Time Protocol Overview on page 256](#)



## Understanding Clock Synchronization

Starting with Junos OS Release 14.2, MX Series and PTX Series routers support external clock synchronization and automatic clock selection for Synchronous Ethernet, T1 or E1 line timing sources, and external inputs.

Starting with Junos OS Release 17.3, MX 10003 routers support external clock synchronization and automatic clock selection for Synchronous Ethernet, T1 or E1 line timing sources, and external inputs.

Configuring external clock synchronization and automatic clock selection requires making clock selection, quality level, and priority considerations. The clock source selection algorithm is used to pick the two best upstream clock sources from among the various sources on the basis of system configuration and execution criteria such as quality level, priority, and hardware restrictions.

MX5-T, MX10-T, MX40-T, MX80, MX80-T, MX240, MX480, MX960, MX2020, PTX3000, and PTX5000 routers support external clock synchronization using Synchronous Ethernet. Synchronous Ethernet is a physical layer technology that functions regardless of the network load and supports hop-by-hop frequency transfer, where all interfaces on the trail must support Synchronous Ethernet.

The Switch Control Board (SCB) supports distributed clocking mode. Starting from Junos OS Release 12.2, the Enhanced Switch Control Board—SCBE—supports centralized clocking mode and has one external clock interface.

Starting from Junos OS Release 13.3, the Enhanced Switch Control Board—SCBE2—supports centralized clocking mode and has two external clock interfaces external-0/0 and external-1/0. Note that the external-0/0 interface refers to the external interface on the SCB in slot 0 and the external 1/0 interface refers to the external interface on the SCB slot 1.



**NOTE:** On SCBE2, you can configure the external synchronization options only on the external interface on the active SCB. Therefore, if the active SCB is in slot 0, then you can configure the external-0/0 interface only. If the active SCB is in slot 1, then you can configure the external-1/0 interface only.

The PTX Series Packet Transport Routers support an external synchronization interface that can be configured to synchronize the internal Stratum 3 clock on the CCG to an external source, and then synchronize the chassis interface clock to that source.

The following sections explain external clock synchronization and its configuration parameters in detail:

- [Clock Selection on page 264](#)
- [Network Option on page 266](#)
- [Clock Mode on page 267](#)
- [Quality Mode on page 267](#)

- [Selection Mode on page 267](#)
- [Hold Interval on page 268](#)
- [Switchover Mode on page 268](#)
- [Clock Source on page 269](#)
- [ESMC Packet Transmit on page 272](#)
- [Global Wait To Restore on page 272](#)
- [Maximum Transmit Quality Level on page 272](#)
- [Interfaces with Upstream Clock Source on page 272](#)
- [External Output Interface on page 275](#)
- [Clock Synchronization Ports on page 276](#)
- [MIC-Level Framing Mode on page 278](#)

## Clock Selection

Configuring external clock synchronization requires making clock selection, quality level, and priority considerations. The clock selection algorithm is used to pick the two best clock sources—primary and secondary—from among the various sources.

The clock selection algorithm is on the basis of the system configuration and execution criteria such as quality level, priority, hardware restrictions, and so on, and is achieved using the following logic and restrictions:

- The following parameters must be configured irrespective of whether the quality level is enabled or not (You can set the quality level with the **set chassis synchronization source interfaces external quality-level *quality-level*** configuration command at the **[edit]** hierarchy level.):
  - Quality level must be configured for nonexternal clocks.
  - In the case of option-1, the quality level must be configured for the external clocks.
  - In the case of option-2, the default quality level for the external clocks is QL\_STU.

The synchronous Ethernet Equipment Clock (EEC) synchronization networking types option-1 and option-2 map to G.813 option 1 (EEC1) and G.812 type IV clock (EEC1) standards, respectively, and can be configured at the **[edit chassis synchronization]** hierarchy level.

- When the **quality-mode-enable** statement is included at the **[edit chassis synchronization]** hierarchy level, the received quality level must be equal to or better than the configured quality level for that particular source, otherwise that source is not considered for clock selection. This is so that a downstream client is guaranteed clock quality of a certain level. (Note that the term *certain level* here denotes the configured quality level.)
- Starting with Junos OS Release 12.2R1, configuring the quality level for a Synchronous Ethernet interface is optional when the **quality-mode-enable** and the **selection-mode received-quality** statements are included at the **[edit chassis synchronization]** hierarchy level.

The default quality level value for a Synchronous Ethernet interface is:

- **SEC** for the option-1 network type.
- **ST3** for the option-2 network type.
- Configuring the **priority** statement is optional. When not specified, the external-a interface has a higher default priority than the external-b interface, and the external-b interface has a higher default priority than Ethernet-based sources such as ge or xe clock sources, which have the lowest default priority.



**NOTE:** Configured priority is higher than any default priority.

- During clock selection:
  - The active source with the highest quality level is selected.
  - The configured (or default) quality level of the selected clock source is used for Ethernet Synchronization Message Channel (ESMC). In order to receive or transmit ESMC messages out of an interface, at least one logical interface must be configured on that interface.
  - [Table 55 on page 265](#) explains a few scenarios that must be taken into consideration during clock selection:

**Table 55: Clock Selection Scenarios**

If	Then
Two or more sources have the same quality level.	The source with highest priority is selected.
Two or more sources have the same quality level and priority.	The current active source, if any, among these sources is selected.
Two or more sources have the same quality level and priority, and none of these is currently active.	Any one of these sources is selected.
Primary clock source is ge xe-x/y/z, where y is even (0 or 2).	<p>The secondary clock source cannot be ge xe-x/y/* or ge xe-x/y + 1/*.</p> <p>For example, if ge-1/2/3 is the primary clock source, then the secondary clock source cannot be ge-1/2/* or ge-1/3/* for an MX80, MX240, MX480, or an MX960 router.</p>
Primary clock source is ge xe-x/y/z, where y is odd (1 or 3).	<p>The secondary clock source cannot be ge xe-x/y/* or ge xe-x/y - 1/*.</p> <p>For example, if xe-2/3/4 is the primary clock source, then the secondary clock source cannot be xe-2/2/* or xe-2/3/* for an MX80, MX240, MX480, or an MX960 router.</p>
Primary clock source is ge xe-x/y/z.	<p>The secondary clock source cannot be ge xe-x/y/* in the case of 12-port or 16-port 10-Gigabit Ethernet DPC on an MX Series router.</p> <p>For example, if ge-0/1/2 is the primary clock source, then ge-0/1/* cannot be the secondary clock source, but ge-0/0/* can be the secondary clock source.</p>

Starting with Junos OS Release 14.2, note that on PTX Series routers, you can specify the primary and secondary clock sources provided the clock source meets the necessary qualification as set by the clock algorithm. However, in the absence of any user-selected clock source, the clock source with the best quality level is selected by the clock algorithm in the router. Note that the user selection is honored even when better quality level clock sources are available. You can select the clock source with the **request chassis synchronization switch clock-source** operational mode command. For more information, see [request chassis synchronization switch](#).



**NOTE:** The clock sources used as primary or secondary clock sources cannot originate from the same FPC.

## Network Option

The clock type or network option is the synchronous Ethernet Equipment Clock (EEC) synchronization networking type. You can set the network option to one of the following values:

- **option-1**—This option maps to G.813 option 1 (EEC1).
- **option-2**—This option maps to G.812 type IV clock (EEC1).



**NOTE:** On MX104 routers, to configure the OC-192, OC-3, OC-12, or OC-48 interfaces as clock sources, ensure that the *option-2* network option is configured.



**NOTE:** For SCB, this option is configured with the **set chassis synchronization network-type (option-1 | option-2)** configuration command at the **[edit]** hierarchy level.

To configure the clock type, execute the **set chassis synchronization network-option (option-1 | option-2)** configuration command at the **[edit]** hierarchy level.



**NOTE:** For Junos OS Releases 11.2R4 through 13.3R3 for MX240, MX480, MX960, MX2010, and MX2020 with SCB, SCBE or SCBE2, you must execute some specific commands after you change the network option at the **[edit chassis synchronization]** hierarchy level. This is because the loop bandwidth does not change automatically when you change the network option. These are the required commands:

```
user@host# deactivate chassis synchronization
user@host# activate chassis synchronization
```

## Clock Mode

You can set the Synchronous Ethernet clock source to one of the following modes:

- **free-run**—In this mode, the free-running local oscillator is used as a clock source.



**NOTE:** For MX80 routers, the free-run clock is provided by the local oscillator.

For MX240, MX480, and MX960 routers with an SCB, the free-run clock is provided by the MPCs.

For MX240, MX480, and MX960 routers with an SCBE or an SCBE2, the free-run clock is provided by the local oscillator.

- **auto-select**—In this mode, the best external clock source is selected.

By default, the auto-select option is selected.

To configure the clock mode, execute the **set chassis synchronization clock-mode (free-run | auto-select)** configuration command at the **[edit]** hierarchy level.

## Quality Mode

When the **quality-mode-enable** statement is included at the **[edit chassis synchronization]** hierarchy level, the system ascertains that the clock selection algorithm uses both quality and priority of the clock sources to select the best clock source for clock synchronization. When the **quality-mode-enable** statement is not included, only the priority of the clock source is taken into account by the algorithm.

To enable the synchronization quality mode, include the **quality-mode-enable** statement at the **[edit chassis synchronization]** hierarchy level.



**NOTE:** The Synchronous Ethernet ESMC quality mode is disabled by default. The Synchronous Ethernet ESMC quality mode is disabled when the **quality-mode-enable** statement is not included.

## Selection Mode

You can specify whether the clock source selection must use the configured or the received ESMC or SSM quality level for a qualifying interface. In both selection modes, the interface qualifies for clock source selection only when the received ESMC or SSM quality level on the interface is equal to or greater than the configured ESMC or SSM quality level for the interface.

The selection modes are:

- **configured-quality**—In this mode, the clock source selection algorithm uses the ESMC or SSM quality level configured for a qualifying interface.

- **received-quality**—In this mode, the clock source selection algorithm uses the ESMC or SSM quality level received on the qualifying interface.

To configure the clock source algorithm selection mode, execute the **set chassis synchronization selection-mode (configured-quality|received-quality)** configuration command at the **[edit]** hierarchy level.



**NOTE:** For the **selection-mode** statement to take effect, you must include the **quality-mode-enable** statement at the **[edit chassis synchronization]** hierarchy level.

## Hold Interval

You can set the chassis synchronization wait time after a change in configuration, the clock selection wait time after reboot of the router, and the switchover wait time after a switchover of SCB before selecting the new clock source. The hold interval options are:

- **configuration-change**—In this mode, the wait time for clock selection after a change in configuration (clock synchronization configuration) can be set from 15 seconds through 60 seconds.
- **restart**—In this mode, the wait time for clock selection after reboot of the router can be set from 60 seconds through 180 seconds.
- **switchover**—In this mode, the switchover wait time after clock recovery can be set from 30 seconds through 60 seconds.

To set the hold interval, execute the **set chassis synchronization hold-interval (configuration-change | restart | switchover) seconds** configuration command at the **[edit]** hierarchy level.



**NOTE:** The default switchover wait time is 30 seconds and the default restart wait time is 120 seconds.

## Switchover Mode

You can set the switchover mode to switch the clock from a lower quality source to higher quality source or to use the current clock source only. You can configure the switchover mode to one of the following:

- **non-revertive**—In this mode, the router uses the current clock source as long as it is valid.
- **revertive**—In this mode, the router automatically switches from a lower to a higher quality clock source whenever the higher clock source becomes available.

The default mode is revertive mode.

To configure the switching mode, execute the **set chassis synchronization switchover-mode (revertive | non-revertive)** configuration command at the **[edit]** hierarchy level.

## Clock Source

You can specify the parameters that must be considered by the clock selection algorithm while selecting the best clock source. The parameters include the quality level value, the priority of the clock source, the request criteria, and the wait time to restore the interface signal to up state. You must specify these parameters on the external clock interfaces or other qualifying interfaces—which are connected to valid clock sources—to select the best clock source on the basis of the timing messages that are received on these interfaces.

For an SCBE, you can configure only one external interface and configure multiple Ethernet interfaces as needed.

On SCBE2, you can configure two external interfaces—external-0/0 and external-1/0—and configure multiple Ethernet interfaces as needed.

To configure the clock source, execute the **set chassis synchronization source interfaces interface-name** configuration command. You can also configure the clock source with the **set chassis synchronization source interfaces external** at the **[edit]** hierarchy level, where the external option refers to an external clock interface.



**NOTE:** Incorporate the external option as needed on the basis of the SCB in your MX Series router.

To specify the clock source for an interface, you must set the following options:

- **priority**—You can set the user priority for the selected clock source from 1 through 5.  
To set the synchronization source priority for the selected clock source, execute the **set chassis synchronization source interfaces interface-name priority number** configuration command or the **set chassis synchronization source interfaces external priority number** configuration command at the **[edit]** hierarchy level.
- **request**—You can set the clock selection request criterion as one of the following:
  - **force-switch**—With this option, you can force the SCB to switch to a clock source you prefer on a particular interface (that is you can select a clock source on an interface overriding the algorithm), provided the source is enabled and not locked out. Only one configured source can be force-switched.
  - **lockout**—With this option configured, the clock source is not to be considered by the selection process. Lockout can be configured for any source.

To configure these options, execute the **set chassis synchronization source interfaces interface-name request (force-switch|lockout)** configuration command or the **set chassis synchronization source interfaces external request (force-switch|lockout)** configuration command at the **[edit]** hierarchy level.

- **wait-to-restore**—You can set the wait-to-restore time for each interface. When an interface's signal transitions out of the signal fail state, it must be fault-free for the wait-to-restore time before it is again considered by the clock selection process. You can configure the interface signal upstate time—wait time before opening the interface to receive ESMC messages—from 0 through 12 minutes. The default time is 5 minutes. When the ESMC clock's EEC quality level (QL) mode is enabled, it sends a signal failure to the clock selection process during the wait-to-restore time. After the wait-to-restore time ends, a new quality level value is sent to the clock selection process.

To configure the wait-to-restore time, execute the **set chassis synchronization source interfaces *interface-name* wait-to-restore *minutes*** configuration command or the **set chassis synchronization source interfaces external wait-to-restore *minutes*** configuration command at the [edit] hierarchy level.

- **hold-off-time**—Starting with Junos OS Release 14.2, you can configure hold-off time for Synchronous Ethernet interfaces and external clock source interfaces to prevent rapid successive switching between signal fail states. If an interface goes down, hold-off time delays short signal failures from being sent to the clock selection process.



**NOTE:** During the hold-off time period, if the clock synchronization process restarts, hold-off time is not considered.

If you configure hold-off time when the ESMC clock's EEC QL mode is enabled, the configured quality level is used in the clock selection process during the hold-off time period. During the hold-off time period, the external clock source appears in a locked state until the hold-off time period ends. After the hold-off time period ends, a signal failure is sent to the clock selection process.

You can configure hold-off time for a range of 300 through 1800 milliseconds. The default hold-off time is 1000 milliseconds.

To configure hold-off time, execute the **set chassis synchronization source interfaces *interface-name* hold-off-time** configuration command at the [edit] hierarchy level.



**NOTE:** When a link goes down and comes back up within the configured hold-off time in a clocking hybrid mode configuration (the combined operation of Synchronous Ethernet and Precision Time Protocol) that includes the protocols **ptp slave convert-clock-class-to-quality-level** configuration statement at the [edit] hierarchy level, the phase might not get locked before the timer expires. This might result in a degradation of clock quality level.

- **quality**—You can set the ESMC clock's EEC quality level as prc, prs, sec, smc, ssu-a, ssu-b, st2, st3, st3e, st4, stu, or tnc. Both option I and option II SSM quality levels are supported. [Table 56 on page 271](#) explains the quality level values.



Table 56: Quality Levels

Quality Level	Description
<b>prc</b>	Timing quality of a primary reference clock (option-1 only).
<b>prs</b>	Clock traceable to a primary reference source (option-2 only).
<b>sec</b>	Timing quality of an SDH equipment clock (option-1 only).
<b>smc</b>	Clock traceable to a self-timed SONET clock (option-2 only).
<b>ssu-a</b>	Timing quality of a type I or IV slave clock (option-1 only).
<b>ssu-b</b>	Timing quality of a type VI slave clock (option-1 only).
<b>st2</b>	Clock traceable to Stratum 2 (option-2 only).
<b>st3</b>	Clock traceable to Stratum 3 (option-2 only).
<b>st3e</b>	Clock traceable to Stratum 3E (option-2 only).
<b>st4</b>	Clock traceable to Stratum 4 free-run (option-2 only).
<b>stu</b>	Clock traceable to an unknown quality (option-2 only).
<b>tnc</b>	Clock traceable to a transit node clock (option-2 only).



**NOTE:** When the quality level is not configured and no ESMC messages are received by the clock source, then the quality level is set to DNU for option-1 and DUS for option-2. You can configure the network options, option-1 and option-2 at the [edit chassis synchronization network-option] hierarchy level.

To avoid source looping on the selected active source—primary or secondary source, whichever is active—even when ESMC transmit is not enabled, a DNU ESMC message is sent out when the **network-option** statement is configured as option-1, and a DUS ESMC message is sent out when the **network-option** statement is configured as option-2. This is applicable only for clock sources configured on the Ethernet interfaces.

To configure the quality level, execute the **set chassis synchronization source interfaces *interface-name* quality-level (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc)** configuration command or the **set chassis synchronization source interfaces external quality-level (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc)** configuration command at the [edit] hierarchy level.

## ESMC Packet Transmit

You can enable all the interfaces or configure one or more qualifying interfaces on which to permit ESMC transmit messages by executing the **set chassis synchronization esmc-transmit interfaces (all | *interface-name*)** configuration command at the **[edit]** hierarchy level.

## Global Wait To Restore

Starting with Junos OS Release 14.2, you can globally configure the time in minutes for source ports to be up before opening the Ethernet Synchronization Message Channel (ESMC) for messages. When a port's signal transitions out of the signal fail state, it must be fault-free for the global wait-to-restore time before it is again considered by the clock selection process.

To configure the global wait-to-restore time, include the **global-wait-to-restore** statement at the **[edit chassis synchronization]** hierarchy level.

To override the global wait-to-restore time on a specific interface, include the **wait-to-restore** statement at the **[edit chassis source interfaces (external-a | external-b | interface *interface-name*)]** hierarchy level.

## Maximum Transmit Quality Level

To configure the maximum transmit quality level for SCBE2 as prc, prs, sec, smc, ssu-a, ssu-b, st2, st3, st3e, st4, stu, or tnc, execute the **set chassis synchronization max-transmit-quality-level *quality-level*** configuration command at the **[edit]** hierarchy level.



**NOTE:** Starting from Junos OS Release 13.3, you can configure the **max-transmit-quality-level** statement on SCB and SCBE.



**NOTE:** Starting from Junos OS Release 13.3, for GPS external output, when you configure the maximum transmit quality level as PRC and router is rebooted, no valid output is obtained from SCBE. However, when the maximum transmit quality level is configured to any other quality level other than PRC and the router gets rebooted, then the SCBE works normally.

---

## Interfaces with Upstream Clock Source

You can configure the external interface to operate with a connected router for a clock source. This external interface can be configured for a clock source, which then becomes a candidate for selection as the chassis clock source by the clock source selection algorithm. You can configure several options for the external clock source interface on the SCBE and for the two external clock source interfaces on the SCBE2.

The options include E1 interface options, pulse-per-second option, the signal type for the provided reference clocks, and the T1 interface options at the **[edit chassis synchronization interfaces external]** hierarchy level.

The following sections explain the clock source interface parameters in detail:

- [E1 Interface Options on page 273](#)
- [Pulse Per Second on page 274](#)
- [Signal Type on page 274](#)
- [T1 Interface Options on page 274](#)

### E1 Interface Options

You can set the E1 interface-specific options as:

- **framing**—Set the framing mode for the E1 interface as one of the following:
  - **g704**—G.704 framing format for E1 interfaces
  - **g704-no-crc4**—G.704 framing without CRC4 for E1 interfaces.

To set the framing mode for the E1 interface, execute the **set chassis synchronization interfaces external e1-options framing (g704|g704-no-crc4)** configuration command at the **[edit]** hierarchy level for SCBE or the **set chassis synchronization interfaces (external-0/0 | external-1/0) e1-options framing (g704|g704-no-crc4)** configuration command at the **[edit]** hierarchy level for SCBE2.

By default, the g704 framing format is selected.

- **line-encoding**—Set the **line-encoding** statement as automatic mark inversion or high-density bipolar 3 code. The line encoding technique converts signals to bipolar pulses. You can set the **line-encoding** option as one of the following:
  - **ami**—Automatic mark inversion
  - **hdb3**—High-density bipolar 3 code

To configure the **line-encoding** statement on the E1 interface, execute the **set chassis synchronization interfaces external e1-options line-encoding (ami|hdb3)** configuration command for SCBE at the **[edit]** hierarchy level or the **set chassis synchronization interfaces (external-0/0 | external-1/0) e1-options line-encoding (ami|hdb3)** configuration command at the **[edit]** hierarchy level for SCBE2.

By default, the hdb3 line encoding technique is selected.

- **sabit**—Set the SA bit to a value from 4 through 8. SA bits are used for exchanging the SSM quality between the clock source and the router on the E1 interface.

To set the SA bit on the E1 interface, execute the **set chassis synchronization interfaces external e1-options sabit sabit-value** configuration command at the **[edit]** hierarchy level for SCBE or the **set chassis synchronization interfaces (external-0/0 | external-1/0) e1-options sabit sabit-value** configuration command at the **[edit]** hierarchy level for SCBE2.

### Pulse Per Second

---

You can enable the **pulse-per-second-enable** option on the GPS interface to receive the pulse per second (PPS) signal by executing the **set chassis synchronization interfaces external pulse-per-second-enable** configuration command at the **[edit]** hierarchy level for SCBE or the **set chassis synchronization interfaces (external-0/0 | external-1/0) pulse-per-second-enable** configuration command at the **[edit]** hierarchy level for SCBE2.

### Signal Type

---

You can set the frequency for the provided reference clock (GPS or BITS) as one of the following:

- **1mhz**—Set the signal with a clock frequency of 1 MHz.
- **5mhz**—Set the signal with a clock frequency of 5 MHz.
- **10mhz**—Set the signal with a clock frequency of 10 MHz.
- **2048khz**—Set the signal with a clock frequency of 2048 kHz.
- **e1**—Set the signal as an E1-coded 2048 kHz signal on a 120-ohm balanced line.
- **t1**—Set the signal as a T1-coded 1.544 MHz signal on a 100-ohm balanced line.

Configure the signal type by executing the **set chassis synchronization interfaces external signal-type (1mhz | 5mhz | 10mhz | 2048khz | e1 | t1)** configuration command at the **[edit]** hierarchy level for SCBE or the **set chassis synchronization interfaces (external-0/0 | external-1/0) signal-type (1hz | 5mhz | 10mhz | 2048khz | e1 | t1)** configuration command at the **[edit]** hierarchy level for SCBE2.

The 1mhz, 5mhz, and the 10mhz signals are traceable to a GPS-capable clock source, where the source can be an atomic clock. The e1 and t1 signals are traceable to a BITS clock source.

### T1 Interface Options

---

You can set the T1 interface-specific options as:

- **framing**—Set the framing mode for the T1 interface as one of the following:
  - **esf**—Extended superframe
  - **sf**—Superframe

To set the framing mode for the T1 interface, execute the **set chassis synchronization interfaces external t1-options framing (esf|sf)** configuration command at the **[edit]** hierarchy level for SCBE or the **set chassis synchronization interfaces (external-0/0 | external-1/0) t1-options framing (esf|sf)** configuration command at the **[edit]** hierarchy level for SCBE2.

By default, the esf framing mode is selected.

- **line-encoding**—Set the **line-encoding** option on the T1 interface as one of the following:
  - a. **ami**—Automatic mark inversion

b. **b8zs**—8-bit zero suppression

To configure the **line-encoding** option on the T1 interface, execute the **set chassis synchronization interfaces external t1-options line-encoding (ami|b8zs)** configuration command at the **[edit]** hierarchy level for SCBE or the **set chassis synchronization interfaces (external-0/0 | external-1/0) t1-options line-encoding (ami|b8zs)** configuration command at the **[edit]** hierarchy level for SCBE2.

By default, the b8z3 line encoding technique is selected.

## External Output Interface

You can set several options for the external clock output interface for SCBE or for the two external clock output interfaces for SCBE2.

The options include disabling the holdover mode; configuring a minimum quality threshold; configuring a mode to select a clock source; configuring the transmit quality level to DNU or DUS; and disabling wander filtering at the **[edit chassis synchronization output interfaces external]** hierarchy level for SCBE or at the **[edit chassis synchronization output interfaces (external0-0 | external-1/0)]** hierarchy level for SCBE2.

The following sections explain the external output interface parameters in detail:

- [Holdover Mode on page 275](#)
- [Minimum Quality on page 275](#)
- [Source Mode on page 276](#)
- [Transmit Quality Level on page 276](#)
- [Wander Filter on page 276](#)

### Holdover Mode

You can disable the holdover mode on the external output interface by executing the **set chassis synchronization output interfaces external holdover-mode-disable** configuration command at the **[edit]** hierarchy level for SCBE or the **set chassis synchronization output interfaces (external-0/0 | external-1/0) holdover-mode-disable** configuration command at the **[edit]** hierarchy level for SCBE2.

### Minimum Quality

When the quality of the source signal—used to derive the output—falls below a minimum quality level, the output of the external interface is placed in holdover mode. When the signal type supports the SSM quality level, the SSM quality level is set as the holdover quality level. The output interface remains in holdover mode until a source with the minimum quality level or higher is available. Note that when the **holdover-mode-disable** option is configured, the output is suppressed completely.

You can set the minimum quality on the external output interface as prc, prs, sec, smc, ssu-a, ssu-b, st2, st3, st3e, st4, stu, or tnc by executing the **set chassis synchronization output interfaces external minimum-quality quality-level** configuration command at the **[edit]** hierarchy level for SCBE or the **set chassis synchronization output interfaces**

(**external-0/0 | external-1/0**) **minimum-quality *quality-level*** configuration command at the **[edit]** hierarchy level for SCBE2.

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### Source Mode

When the source mode is set to chassis, the source selected by the chassis clock module is used as the clock source. When the source mode is set to line, the best available line clock is selected.

You can set the source mode for selecting a clock source as either a chassis clock or the best line clock source as output by executing the **set chassis synchronization output interfaces external source-mode (chassis|line)** configuration command at the **[edit]** hierarchy level for SCBE or the **set chassis synchronization output interfaces (external-0/0 | external-1/0) source-mode (chassis|line)** configuration command at the **[edit]** hierarchy level for SCBE2.

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### Transmit Quality Level

You can configure the **tx-dnu-to-line-source-enable** statement to enable the transmit quality level to DNU or DUS when the chassis clock is the BITS input signal and when a valid line source signal is sent out through the BITS output.

You can set the transmitting quality level to DNU or DUS on the line source interface by executing the **set chassis synchronization output interfaces external tx-dnu-to-line-source-enable** configuration command at the **[edit]** hierarchy level for SCBE or the **set chassis synchronization output interfaces (external-0/0 | external-1/0) tx-dnu-to-line-source-enable** configuration command at the **[edit]** hierarchy level at SCBE2.

---

### Wander Filter

You can disable the wander filter by executing the **set chassis synchronization output interfaces external wander-filter-disable** configuration command at the **[edit]** hierarchy level for SCBE or the **set chassis synchronization output interfaces (external-0/0 | external-1/0) wander-filter-disable** configuration command at the **[edit]** hierarchy level for SCBE2.

## Clock Synchronization Ports

Starting with Junos OS Release 13.3, you can set the **time-of-day-format** statement as an ASCII string on SCBE and SCBE2 by executing the **set chassis synchronization port auxiliary client time-of-day-format ascii string** configuration command at the **[edit]** hierarchy level.

The time of day (TOD) format is specified as a string of ASCII characters. The TOD format string contains information that specifies which ASCII characters to match, which ASCII characters to ignore, and which ASCII characters to translate to particular time units (such as month, day, hour, minute, and so on).

The TOD format string specifies how the incoming string is to be parsed so that the information embedded can be extracted. The format of the TOD option can be executed with the **set chassis synchronization port auxiliary time-of-day-format ascii *string***

configuration command at the **[edit]** hierarchy level, where the format of the data string is `$GPRMC,%hh%mm%ss,^,^,^,^,^,^,^,^,^,^,%DD%MM%YY,^,^,^,^,^,^,^,^`.

[Table 57 on page 277](#) explains pattern-matching characters used in the TOD data string.

**Table 57: Pattern-Matching Characters**

Character construct	Number of characters	Description
-	1	The <i>DO NOT CARE</i> (DNC) character
%hh	2	Hours (00–23)
%mm	2	Minutes (00–59)
%ss	2	Seconds (00–59)
%DD	2	Day (01–31)
%MM	2	Month (01–12)
%YY	2	Year without century
%YYY	4	Year with century
%DDD	3	Day of year (001–366)
%MMM	3	Month of year (JAN, FEB, etc.)
%cc	2	NMEA message checksum
%Q	1	Time quality indicator ('' = valid '*' = error)

There are several patterns that can be received by a router. The following pattern shows an example of a received TOD data string (as defined in the National Marine Electronics Association (NMEA) 0183 standard. The data string is called the Recommended Minimum Specific GPS/Transit Data (RMC) message.) and [Table 58 on page 277](#) explains it in detail.

```
$GPRMC,225446,A,4916.45,N,12311.12,W,0.00,5.054,7,191194,020.3,E*68<CR><LF>
```

**Table 58: Received TOD Data String**

Pattern	Description
\$GPRMC	NMEA sentence ID
225446	UTC time of fix (22:54:46 UTC)
A	Data status (A=Valid position, V=navigation receiver warning)

Table 58: Received TOD Data String (continued)

Pattern	Description
4916.45	Latitude of fix
N	N or S of longitude
12311.12	Longitude of fix
W	E or W of longitude
000.5	Speed over ground in knots
054.7	Track made good in degrees True
191194	UTC date of fix (19 November 1994)
020.3	Magnetic variation degrees
E	E or W of magnetic variation
*68	Checksum (XOR of all characters between \$ and *)



**NOTE:** Whenever a TOD data string does not provide sufficient information, the router extracts it from Junos OS and generates a log message. The TOD data string that is either transmitted or received is always of fixed length and is delimited by a <CR><LF>character pair, where CR (carriage return) and LF (line feed) are the line break types used to end the ASCII format string.

## MIC-Level Framing Mode

You can configure the LAN framing mode on the 10-Gigabit Ethernet MIC with XFP by executing the **set chassis fpc fpc-slot pic pic-slot framing lan** at the **[edit]** hierarchy level.

Note that to operate in LAN framing mode on the 10-Gigabit Ethernet MIC with XFP, you must configure the interface framing mode on the MIC interface. Execute the **set interfaces xe-fpc/pic/port framing-mode (lan-phy | wan-phy)** configuration command at the **[edit]** hierarchy level, where the lan-phy option denotes a 802.3ae 10-Gbps LAN-mode interface and the wan-phy option denotes a 802.3ae 10-Gbps WAN-mode interface.



Release History Table

Release	Description
17.3	Starting with Junos OS Release 17.3, MX 10003 routers support external clock synchronization and automatic clock selection for Synchronous Ethernet, T1 or E1 line timing sources, and external inputs.
14.2	Starting with Junos OS Release 14.2, MX Series and PTX Series routers support external clock synchronization and automatic clock selection for Synchronous Ethernet, T1 or E1 line timing sources, and external inputs.
14.2	Starting with Junos OS Release 14.2, note that on PTX Series routers, you can specify the primary and secondary clock sources provided the clock source meets the necessary qualification as set by the clock algorithm.
14.2	Starting with Junos OS Release 14.2, you can configure hold-off time for Synchronous Ethernet interfaces and external clock source interfaces to prevent rapid successive switching between signal fail states.
14.2	Starting with Junos OS Release 14.2, you can globally configure the time in minutes for source ports to be up before opening the Ethernet Synchronization Message Channel (ESMC) for messages.
13.3	Starting from Junos OS Release 13.3, the Enhanced Switch Control Board—SCBE2—supports centralized clocking mode and has two external clock interfaces external-0/0 and external-1/0.
13.3	Starting from Junos OS Release 13.3, you can configure the <b>max-transmit-quality-level</b> statement on SCB and SCBE.
13.3	Starting from Junos OS Release 13.3, for GPS external output, when you configure the maximum transmit quality level as PRC and router is rebooted, no valid output is obtained from SCBE.
13.3	Starting with Junos OS Release 13.3, you can set the <b>time-of-day-format</b> statement as an ASCII string on SCBE and SCBE2 by executing the <b>set chassis synchronization port auxiliary client time-of-day-format ascii string</b> configuration command at the <b>[edit]</b> hierarchy level.
12.2	Starting from Junos OS Release 12.2, the Enhanced Switch Control Board—SCBE—supports centralized clocking mode and has one external clock interface.
12.2	Starting with Junos OS Release 12.2R1, configuring the quality level for a Synchronous Ethernet interface is optional when the <b>quality-mode-enable</b> and the <b>selection-mode received-quality</b> statements are included at the <b>[edit chassis synchronization]</b> hierarchy level.
11.2-13.3	For Junos OS Releases 11.2R4 through 13.3R3 for MX240, MX480, MX960, MX2010, and MX2020 with SCB, SCBE or SCBE2, you must execute some specific commands after you change the network option at the <b>[edit chassis synchronization]</b> hierarchy level.

Related • [Centralized Clocking Overview on page 232](#)

- Documentation**
- [Clock Sources for PTX Series Packet Transport Routers on page 306](#)
  - [Configuring Clock Synchronization Interface on MX Series Routers on page 293](#)
  - [Synchronizing Internal Stratum 3 Clock to External Clock Sources on PTX Series Routers on page 308](#)
  - [Ethernet Synchronization Message Channel Overview on page 238](#)
  - [Example: Configuring Synchronous Ethernet on MX Series Routers on page 311](#)
  - [request chassis synchronization mode on page 910](#)
  - [show chassis synchronization \(MX Series Routers\) on page 2161](#)
  - [synchronization \(MX Series\) on page 794](#)
  - [synchronization \(PTX Series\) on page 802](#)

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## Understanding ESMC Quality Level Mapping

Ethernet Synchronization Message Channel (ESMC) is a logical communication channel. It transmits Synchronization Status Message (SSM) information, which is the quality level of the transmitting synchronous Ethernet equipment clock (EEC), by using ESMC protocol data units (PDUs). ESMC support is based on the ITU G.8264 specification. In order for an interface to receive or transmit ESMC messages, at least one logical interface must be configured on that interface. If the interface is currently not configured with a logical interface, you must configure a logical interface by using the **[set interfaces interface-name unit 0]** statement at the **[edit]** hierarchy level.

The following factors affect the ESMC quality level value that is transmitted out on the interfaces configured at the **[edit chassis synchronization esmc-transmit interfaces]** hierarchy level:

- Quality mode
- Selection mode
- Conversion of PTP clock class flag

Other than the aforementioned factors, the software phase lock loop (spll) state or the hybrid state impacts the transmitted ESMC quality level when the router is in PTP mode or hybrid mode, respectively.

The following sections explain how the ESMC quality level is handled in various situations:

- [Synchronous Ethernet Mode on page 281](#)
- [Precision Time Protocol Mode on page 281](#)
- [Hybrid Mode on page 283](#)
- [Feature Mode Changes on page 283](#)

## Synchronous Ethernet Mode

In Synchronous Ethernet mode, the ESMC quality level is handled in the following way:

- In quality mode:
  - If the **quality-mode-enable** option at the **[show chassis synchronization]** hierarchy level is not set, then the configured quality and the priority set for the clock sources are used for the clock selection. The ESMC quality level is based on the configured quality level corresponding to the active clock source.
  - If the **quality-mode-enable** option at the **[show chassis synchronization]** hierarchy level is set, then only those clock sources that receive ESMC quality level is higher than or equal to the configured quality are considered for selection. The ESMC quality level value transmitted also depends on the selection mode option as discussed next.
- In selection mode:
  - If the **selection-mode** option at the **[show chassis synchronization]** hierarchy level is set to **configured-quality**, then the configured quality for the selected, active source is used as the system ESMC quality level value that is transmitted out.
  - If the **selection-mode** option at the **[show chassis synchronization]** hierarchy level is set to **received-quality**, then the received ESMC quality level value from the selected clock source is transmitted out.
- When no clock sources are locked:
  - a. Do Not Use (DNU)/Don't Use for Synchronization (DUS) quality level is transmitted.
  - b. The ESMC quality level value sent out on the selected, active clock source interface is always DNU/DUS.

## Precision Time Protocol Mode

In Precision Time Protocol (PTP) mode, you can transmit ESMC quality level values with the following parameters set:

- The **network-option** option must be configured at the **[edit chassis synchronization]** hierarchy level.
- Synchronous Ethernet sources must not be configured at the **[edit chassis synchronization]** hierarchy level.
- The **convert-clock-class-to-quality-level** option at the **[edit protocols ptp slave]** hierarchy level must be enabled so that the PTP clock class received from the selected master is converted to the appropriate ESMC quality level.

Clock class is a value that ranges from 80 through 109 and is used to map the clock class to the set ESMC quality level. The ESMC quality level value is mapped to the clock class value by one of the following methods:

- Mapping of PTP clock class to ESMC quality level—By default, the standard mappings suggested by ITU-T G.781 specification are used as shown in [Table 59 on page 282](#) and irrespective of the clock being configured in hybrid mode or pure PTP mode, the outgoing quality level is always based on the PTP clock class mapping. To map the PTP clock class to the ESMC quality level, you must set the **convert-clock-class-to-quality-level** option at the **[edit protocols ptp slave]** hierarchy level. For default mapping values, see [Table 59 on page 282](#).

**Table 59: Default Quality Level to PTP Clock-Class Mapping**

SSM QL (Binary)	Standard Mappings Given in ITU-T G.781 Specification		PTP Clock Class
	Option I	Option II	
0001	-	QL-PRS	80
0000	-	QL-STU	82
0010	QL-PRC	-	84
0111	-	QL-ST2	86
0011	-	-	88
0100	QL-SSU-A	QL-TNC	90
0101	-	-	92
0110	-	-	94
1000	QL-SSU-B	-	96
1001	-	-	98
1101	-	QL-ST3E	100
1010	-	QL-ST3/ QL-EEC2	102
1011	QL-SEC/ QL-EEC1		104
1100	-	QL-SMC	106
1110	-	QL-PROV	108
1111	QL-DNU	QL-DUS	110

- User-defined mapping of PTP clock class to ESMC quality level—You can manually override the clock class to ESMC mapping by setting the **clock-class** option at the **[edit protocols ptp slave clock-class-to-quality-level-mapping quality level ql-value]** hierarchy level.

Unlike Synchronous Ethernet, the DNU/DUS quality level value is not transmitted on the interface on which the PTP master is configured. In PTP mode, an interface is configured as part of the **[edit chassis esmc-transmit interfaces]** hierarchy level, and an appropriate ESMC quality level value is transmitted through it. Note that when the PTP clock class value received from the master changes, the ESMC quality level transmitted also changes appropriately. If there is no valid clock class value as input, then the DNU/DUS value is transmitted on the interfaces configured under the **esmc-transmit** option at the **[edit chassis synchronization]** hierarchy level.

To view the current mapping between the clock class and the ESMC quality level, run the **show ptp quality-level-mapping** operational mode command.

To display the ESMC quality level currently transmitted by the interface, run the **show ptp global-information** operational mode command in PTP or hybrid mode. Note that when the **convert-clock-class-to-quality-level** option is disabled or when there is no valid clock class as input, the **show ptp global information** command does not display the ESMC quality level value.

To view the ESMC quality level transmitted in all modes, run the **show synchronous-ethernet esmc transmit detail** operational mode command.

## Hybrid Mode

Hybrid mode is a combination of PTP and Synchronous Ethernet modes.

The configuration required for transmitting the ESMC quality level in hybrid mode differs from that in PTP mode in the following ways:

- In hybrid mode, synchronous Ethernet source interfaces must be configured at the **[edit chassis synchronization]** hierarchy level.
- In hybrid mode, configuring the **convert-clock-class-to-quality-level** option is optional. When this option is configured, the outgoing ESMC quality level behavior is the same as that in PTP mode. When the **convert-clock-class-to-quality-level** option is not configured, the outgoing ESMC quality level behavior is the same as that in Synchronous Ethernet mode.

## Feature Mode Changes

When the router configuration is changed from one feature mode to another mode—that is from or to Synchronous Ethernet, PTP, or hybrid mode—the following occurs:

1. The ESMC quality level is reset to DNU.
2. Based on the new feature mode, the ESMC quality level is decided:
  - When the reference clock qualifies for Synchronous Ethernet mode.

- When PTP goes into phase-aligned state or hold-over state in PTP mode.
- When the hybrid state reaches *frequency and phase aligned* state in hybrid mode.

Sometimes PTP is required to drive Synchronous Ethernet and ESMC. This scenario occurs when:

- After certain PTP hops, the network branches out, and one branch of the network requires only frequency synchronization while the other branch requires both phase and frequency synchronization.
- A packet-based distribution network is located between a time-division multiplexing (TDM), a SONET, and a Synchronous Ethernet network.

In such situations, the clock recovered by PTP is sent over the Ethernet physical transceiver for Synchronous Ethernet, and the ESMC quality level value mapping with the PTP clock class is sent over the interfaces.

#### Related Documentation

- [Configuring Hybrid Mode and ESMC Quality Level Mapping on page 329](#)
- [Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 333](#)
- [Understanding Hybrid Mode on page 288](#)
- [Precision Time Protocol Overview on page 256](#)
- [Synchronous Ethernet Overview on page 242](#)

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## PTP Trace Overview

Precision Time Protocol (PTP), also known as IEEE 1588v2, works on the principle of phase synchronization and frequency synchronization—it synchronizes both frequency and phase, including time of day. Phase synchronization is achieved either by adjusting the phase of the slave clock (the router's internal clock oscillator) discontinuously—by receiving clock signals from the master clock at irregular periods of time—or by adjusting the phase-locked loop of the slave's internal clock at regular intervals. The accuracy of clock synchronization depends on factors such as packet delay variation, quality of oscillator used, network asymmetry, and so on. For information about PTP, see [“Precision Time Protocol Overview” on page 256](#).

Starting with Junos OS Release 13.3R4, you can implement a path trace mechanism to detect PTP loops that circulate endlessly within a PTP ring of boundary clocks over an IPv4 network. The PTP ring topology implementation uses the 1588v2 path trace mechanism to prevent PTP loops and to provide PTP convergence in the event of any single-point failure.

The following sections explain the path trace mechanism and how it is implemented in a multiple-grandmaster PTP ring topology over an IPv4 network. The sections also explain steady state and failure handling in a PTP ring topology:

- [PTP Ring Topology on page 285](#)
- [Path Trace Mechanism Overview on page 285](#)

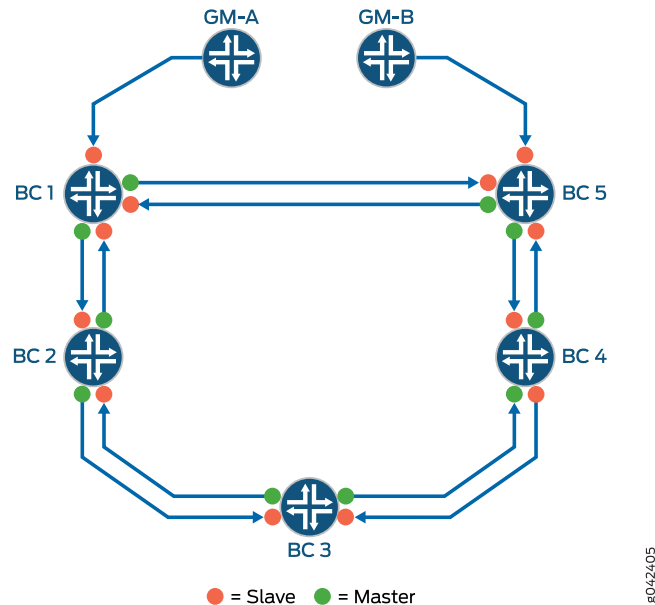
- [Steady State on page 286](#)
- [Failure Handling on page 287](#)
- [PTP Ring Topology Without Path Trace Mechanism on page 287](#)

## PTP Ring Topology

A PTP ring topology is a ring topology that consists of one or more grandmaster clocks and several boundary clocks.

Consider a simple ring topology of boundary clocks—BC1 through BC5—driven by one primary PTP grandmaster clock and one backup PTP grandmaster clock—GM-A and GM-B, respectively—as illustrated in [Figure 6 on page 285](#). Assume that GM-A is superior to GM-B—that is, the quality level of GM-A's clock is higher than that of GM-B's clock.

*Figure 6: Multiple-Grandmaster PTP Ring Topology*



Each boundary clock in the PTP ring is configured as both slave and master to its immediate neighbor to provide seamless PTP grandmaster clock switchover in case of grandmaster or boundary clock failure. For example, in [Figure 6 on page 285](#) BC2 is both master and slave to both BC1 and BC3, BC3 is both master and slave to BC2 and BC4, and so on.

## Path Trace Mechanism Overview

During the process of synchronization in a PTP ring topology, certain announce messages—timing information messages that are sent from master to slave—might form in an infinite loop (also called *PTP loop*) in a network trail of boundary clocks. These PTP loops create issues such as a boundary clock potentially synchronizing its local clock with its own timing information, thereby compromising the quality of the recovered clock. The path trace mechanism is used to detect such loops.

A *path trace* is the route that a PTP announce message takes through the network trail of boundary clocks and is tracked through the path trace TLV in the announce message. A path trace TLV (type, length, and value) is a set of octets in an announce message that includes the TLV type, the length field, and the path sequence. The path trace sequence contains the clock ID of each boundary clock that an announce message traverses through the PTP ring.

One of the principal uses of the path trace mechanism is to detect the so-called *rogue announce messages* that circulate endlessly in loops in the PTP ring of boundary clocks. A boundary clock detects a PTP loop when it finds its own clock ID in the path trace of the received announce message. When such a loop is detected, the router discards the received announce message.

To view the trail of the announce message or path trace, use the **show ptp path-trace detail** operational mode command. For more information, see [show ptp path-trace detail](#).

**NOTE:**

- During GRES, the path trace and the best master clock algorithm information are pushed to the kernel. Therefore, this information is available on the backup Routing Engine as well.
  - When the number of boundary clocks in a topology exceeds 20, the path trace TLV is dropped.
  - Currently, the PTP ring topology is supported only for PTP over IPv4 networks.
- 

## Steady State

The PTP ring is considered to be in steady state or operating normally when a router, say BC1, is locked—that is, is connected and synchronized—to a grandmaster clock that has a higher quality level value—higher than the quality level of other grandmaster clocks in the network—and all the other routers in the PTP ring are locked to the grandmaster clock through this router BC1. For example in [Figure 6 on page 285](#), during steady state, BC1 is locked to GM-A, BC2 and BC5 are locked to BC1, BC3 is locked to BC2, and BC4 is locked to BC5. When the path trace mechanism is implemented in this ring topology, a clock ID is assigned to each boundary clock that, in turn, is included in the path trace TLV within the announce message. Therefore, the path trace TLV in the announce message originating from BC1 has its own clock ID—CID1. Similarly, the announce message from BC2 has its own clock ID—CID2—and BC1's clock ID—CID1—and so on.

As router BC2 is master to BC1, BC1 constantly receives BC2's announce messages. The announce messages from BC2 received on BC1 contains BC1's own clock ID—CID1—along with BC2's clock ID—CID2. Because BC1 receives its own clock ID—CID1—in the announce message, BC1 drops BC2's announce messages. Similarly, BC2 drops BC3's announce messages as the messages contain BC2's clock ID—CID2—along with other clock IDs—CID1 and CID3. Note that this behavior is intentional and by design, as is explained in [“Failure Handling” on page 287](#).



## Failure Handling

Consider a scenario where the router BC1 crashes in the PTP ring illustrated in [Figure 6 on page 285](#). This failure is handled in the following way:

1. The router BC2 stops receiving announce messages from BC1.
2. The announce messages now received by BC2 are only those sent by BC3. BC2 drops these announce messages because these messages contain BC2's own clock ID—CID2.
3. Because BC2 does not receive any valid announce messages, it goes into holdover mode and lowers the value of its announce parameters, such as clock class, which results in BC2 announce messages carrying an inferior clock class.
4. When BC3 receives these announce messages with inferior clock class from BC2, it in turn announces this inferior clock class to all the downstream routers.
5. When BC5 eventually receives this announce message with the inferior quality level value from BC4, the best master clock algorithm running on the BC5 router switches BC5 to GM-B automatically and the BC5 router sends announce messages corresponding to the parameters as set by GM-B.
6. When BC4 receives this announce message—carrying superior clock class information as compared to that carried by BC3's announce message—the BC4 router switches to BC5. Similarly, BC3 locks to BC4 and then BC2 locks to BC3. In other words, the ring topology shown in [Figure 6 on page 285](#) converges to a clockwise hierarchy of boundary clocks. This entire process takes a few tens of seconds.

Note that each PTP best master clock algorithm switchover at each boundary clock is seamless and thereby ensures that the performance of the PTP ring does not degrade. However, when there are multiple simultaneous failures in the ring topology—for example, simultaneous link failures between GM-A and BC1 and between BC4 and BC5—the short-term absolute maximum time interval error (MTIE) might go up to 650ns—for example, between routers BC2 to BC4. Note that this type of multiple failures in a ring topology is rare.

MTIE is a maximum phase variation error that is measured over a period of time, where the error is calculated between the phase variation of a signal with the perfect signal.

## PTP Ring Topology Without Path Trace Mechanism

When the PTP path trace mechanism is not implemented, the BC2 router cannot detect announce messages from BC3 that are actually BC2's looped announce messages. This, in turn, results in BC2 attempting to lock to BC3 (while BC3 is already locked to BC2) and a PTP deadlock is created. Because of the PTP deadlock, there is a significant clock drift over a period of time on both BC2 and BC3 and potentially on all the boundary clocks that can be traced to BC3.

Note that when the crashed router BC1 comes up, it chooses GM-A as its master, and it sends out announce messages that carry superior clock class information compared to those carried by announce messages sent out by GM-B. The BC2 router's best master clock algorithm determines that the BC1's announce messages carry superior clock class

information as compared to BC3's, resulting in BC2 switching back to BC1. Similarly, BC3 switches back to BC2. This way, the ring topology is restored to the pre-crash topology.

#### Release History Table

Release	Description
13.3R4	Starting with Junos OS Release 13.3R4, you can implement a path trace mechanism to detect PTP loops that circulate endlessly within a PTP ring of boundary clocks over an IPv4 network.

#### Related Documentation

- [Precision Time Protocol Overview on page 256](#)
- [show ptp path-trace detail on page 2266](#)

## Understanding Hybrid Mode

The combined operation of Synchronous Ethernet and Precision Time Protocol (PTP) is also known as hybrid mode.

The following sections explain hybrid mode in detail:

- [Hybrid Mode Overview on page 288](#)
- [Supporting Platforms on page 290](#)

### Hybrid Mode Overview

In hybrid mode, the synchronous Ethernet equipment clock (EEC) on the Modular Port Concentrator (MPC) derives the frequency from Synchronous Ethernet and the phase and time of day from PTP. Time synchronization includes both phase synchronization and frequency synchronization.

Synchronous Ethernet is a physical layer–based technology that functions regardless of the network load. Synchronous Ethernet supports hop-by-hop frequency transfer, where all interfaces on the trail must support Synchronous Ethernet. PTP (also known as IEEE 1588v2) synchronizes clocks between nodes in a network, thereby enabling the distribution of an accurate clock over a packet-switched network. This synchronization is achieved through packets that are transmitted and received in a session between a master clock (commonly called the master) and a slave clock (also known as the slave in PTP terminology).



**NOTE:** Router clocks are categorized based on the role of the router in the network. They are broadly categorized into ordinary clocks and boundary clocks. The master clock and the slave clock are known as ordinary clocks. The boundary clock can operate as either a master or a slave.

Synchronous Ethernet works on the principle of frequency synchronization, whereby the frequencies of all the clocks (intermediate master and slave clocks) in the network are synchronized to the frequency of the master clock at the starting end of the network trail.

PTP works on the principle of phase synchronization and frequency synchronization—it synchronizes both frequency and phase, including time of day. Phase synchronization is achieved either by adjusting the phase of the slave clock (the router's internal clock oscillator) discontinuously by receiving clock signals from the master clock at irregular periods of time or by adjusting the phase-locked loop of the slave internal clock at regular intervals. The accuracy of clock synchronization depends on factors such as packet delay variation, quality of oscillator used, network asymmetry, and so on.

Synchronous Ethernet and PTP provide frequency and phase synchronization; however, accuracy in the order of nanoseconds is difficult to achieve through PTP or Synchronous Ethernet and these technologies do not support a large number of network hops. Hybrid mode resolves these issues by extending the number of network hops and also provides clock synchronization accuracy in the order of tens of nanoseconds. Hybrid mode is configured on the slave. On the slave, you can configure one or more interfaces as Synchronous Ethernet source interfaces.

Hybrid mode has an internal threshold value of 100 nanoseconds for the PTP phase difference before the PTP phase adjustment can initiate. To understand PTP phase difference and adjustment, consider a scenario involving two PTP sources—PTP1 and PTP2—and one Synchronous Ethernet source. Assume that initially the PTP1 source and the Synchronous Ethernet source are up and the PTP2 source is down. Also, assume that the router clock (slave) is synchronized to the available PTP source—PTP1—and the Synchronous Ethernet source. Suppose that after sometime the PTP1 source goes down because of technical issues—during which time the PTP2 source has come up—which, in turn, triggers the best master clock algorithm to run automatically, latching the router clock to the next available PTP source—that is, the PTP2 source—and the Synchronous Ethernet source. Note that a PTP phase adjustment is triggered when the phase difference between the current actual time of day (TOD) and the TOD as calculated by the algorithm as a result of the communication with the PTP2 source is at least 100 nanoseconds. Although this phase difference can occur anytime during the operation of the router in hybrid mode, this phase difference is more likely to occur only during PTP source switchover. You must always add a measurement error of 10 through 20 nanoseconds to the original internal threshold value. This error adjustment results in a phase difference threshold value of 110–120 nanoseconds.

For information about configuring hybrid mode, see “[Configuring Hybrid Mode and ESMC Quality Level Mapping](#)” on page 329. You can use the **show ptp hybrid status** operational command to find the current operating mode.



**NOTE:** Starting in Junos OS Release 14.2R1, in hybrid mode, the EEC in the MPC derives frequency synchronization from Synchronous Ethernet and the phase and time of day from PTP. However, the **show chassis synchronization extensive** operational mode command output displays the lock status that is derived from the EEC located on the SCB.

## Supporting Platforms

Hybrid mode is supported on the Juniper Networks MX104, MX240, MX480, and MX960 Universal Routing Platforms and on the Juniper Networks MX80 Universal Routing Platforms with precision timing support (MX80-P) and with timing support (MX80-T).

Starting in Junos OS Release 17.4R1, the 10GE, 40G, and 100GE WAN ports on MX10003 and MX204 routers support the hybrid mode feature.

On the MX240, MX480, MX960, MX2008, MX2010, and MX2020 routers, the combined operation is possible only when the PTP client and the Synchronous Ethernet source are on the same enhanced MPC and are traceable to the same primary reference clock (PRC). On MX10003, the Synchronous Ethernet source can be from any MPC for the combined operation.

Junos OS supports hybrid mode over link aggregation group (LAG) for MPC2E NG, MPC3E NG, MPC5E, MPC6E, MPC7E-10G, MPC7E-MRATE, MPC8E, and MPC9E line cards. The hybrid operation over LAG is supported only when primary and secondary Synchronous Ethernet interfaces are present on the same line card. The MPC2E NG and MPC3E NG line cards support PTP over IPv4 in hybrid mode over LAG. The MPC5E, MPC6E, MPC7E-10G, MPC7E-MRATE, MPC8E, and MPC9E line cards support both PTP over IPv4 and PTP over Ethernet in hybrid mode over LAG.

This table summarizes the first Junos OS release that supports hybrid mode over LAG on various Juniper Networks devices:

**Table 60: Hybrid mode over LAG Support**

Juniper Network Devices	PTP over IPv4 in hybrid mode over LAG	PTP over Ethernet in hybrid mode over LAG
MPC2E NG	17.2R1	—
MPC3E NG	17.2R1	—
MPC5E	17.2R1	18.2R1
MPC6E	17.2R1	18.2R1
MPC7E-10G	18.1R1	18.3R1
MPC7E-MRATE	18.1R1	18.3R1
MPC8E	18.1R1	18.3R1
MPC9E	18.1R1	18.3R1

When acting as PTP slaves, MX80-P routers can accept any external Synchronous Ethernet clock as reference and do not support building-integrated timing supply (BITS) input as frequency source in hybrid mode of operation. Only Synchronous Ethernet sources

are allowed in hybrid mode. Note that when the selected Synchronous Ethernet reference fails, the router continues to work in PTP mode.

Unified in-service software upgrade (unified ISSU) is not supported when clock synchronization is configured for hybrid mode on MX80-P, MX80-T, MX10003, MX2008, MX2010, MX2020 routers, and on the MICs and enhanced MPCs on MX240, MX480, and MX960 routers.



**NOTE:** To switch between PTP and Synchronous Ethernet modes, you must first deactivate the configuration for the current mode and then commit the configuration. Wait for 30 seconds, configure the new mode and its related parameters, and then commit the configuration.

Release History Table

Release	Description
17.4R1	Starting in Junos OS Release 17.4R1, the 10GE, 40G, and 100GE WAN ports on MX10003 and MX204 routers support the hybrid mode feature.
14.2R1	Starting in Junos OS Release 14.2R1, in hybrid mode, the EEC in the MPC derives frequency synchronization from Synchronous Ethernet and the phase and time of day from PTP.

**Related Documentation**

- [Configuring Hybrid Mode and ESMC Quality Level Mapping on page 329](#)
- [Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 333](#)
- [Precision Time Protocol Overview on page 256](#)
- [Synchronous Ethernet Overview on page 242](#)

## Line Card Redundancy Overview

Line card redundancy is one the PTP redundancy scenarios possible in a mobile backhaul solution. Multiple slave streams are configured across line cards and if the currently active slave line card crashes or all streams on that line card lose their timing packets another slave line card can take over if it has been primed to do so.

When you configure line card redundancy, slave streams are created on appropriate line cards. At this time all of the line cards are in DPLL mode. All of the slave streams are primed to receive and process announce messages.

Each line card executes the BMCA algorithm and identifies the best master and the stream serving the best master. The line card sends the best master information to the RE. After receiving best master information from individual line cards, the RE selects the best master to serve the BC node. This information is propagated to all of the line cards. Once the best master is selected by the RE, the regular PTP state machine will be executed.

If the BMCA algorithm results in a stream switchover and the new stream falls on a different line card, a hitless switchover will be triggered. The new slave card may be configured in pure PTP or Hybrid mode. The old slave card may in pure PTP slave or Hybrid slave mode. The line cards need to go through following steps:

- A slave line card transition needs to happen via holdover state on the master line card.
- FSM needs to convert the old slave line card to pure PTP master mode.
- On the new slave card, FSM needs to be triggered based on pure PTP or hybrid mode of operation. All these transitions need to be hitless.



**NOTE:** Line card redundancy is currently only supported on MPC2E P line cards.

- Related Documentation**
- [show ptp slave on page 2271](#)
  - [show ptp master on page 2263](#)

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## Configuring Junos OS to Support an External Clock Synchronization Interface for M Series, MX Series, and T Series Routers

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The M40e, M120, M320, T640, and T1600 routers support an external synchronization interface that can be configured to synchronize the internal Stratum 3 clock to an external source, and then synchronize the chassis interface clock to that source.

This feature can be configured for external primary and secondary interfaces that use building-integrated timing system (BITS), SDH Equipment Timing Source (SETS) timing sources, or an equivalent quality timing source. When internal timing is set for SONET/SDH, Plesiochronous Digital Hierarchy (PDH), or digital hierarchy (DS-1) interfaces on the Physical Interface Cards (PICs), the transmit clock of the interface is synchronized to BITS/SETS timing and is traceable to timing within the network.

Routers and switches that support an external clock synchronization interface include:

- M40e, M120, and M320 routers
- T640 and T1600 routers

To configure external synchronization on the router, include the **synchronization** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
synchronization {
  signal-type (t1 | e1);
  switching--mode (revertive | non-revertive);
  y-cable-line-termination;
  transmitter-enable;
  validation-interval seconds;
  primary (external-a | external-b);
```

```
secondary (external-a | external-b);
}
```

Use the **synchronization** statement options to specify a primary and secondary timing source. To do this, configure the following options:

- For the M120 and M320 routers, specify a signal type mode for interfaces, either **t1** or **e1**. For the M40e, T640, and T1600 routers, only the **t1** signal type mode is supported. The default setting is **t1**.
- For the T640 and T1600 routers, external clock interfaces are supported on the SONET Clock Generators (SCG-T-EC). The external clock interfaces on the SONET Clock Generators (SCG-T) are not supported.
- Specify the switching mode as **revertive** if a lower-priority synchronization can be switched to a valid, higher-priority synchronization.
- For the M320 router, specify that a single signal should be wired to both Control Boards (CBs) using a Y-cable. For the M40e router, the signal is wired to the CIP and Y-cable functionality is embedded in this system.

The **y-cable-line-termination** option is not available on the M40e, M120, T640, and T1600 routers.

- Control whether the diagnostic timing signal is transmitted.

The **transmitter-enable** option is not available on the M120, T640, and T1600 routers.

- Set a validation interval. The **validation-interval** option validates the synchronized deviation of the synchronization source. If revertive switching is enabled and a higher-priority clock is validated, the clock module is directed to the higher-priority clock, and all configured and active synchronizations are validated. The validation timer resumes after the current validation interval expires. The validation interval can be a value from 90 through 86,400 seconds. The default value is 90 seconds. For the M120 router, the range for the **validation-interval** option is 30 through 86,400 and the default value is **30**.
- Specify the primary external timing source by using the **primary (external-a | external-b)** statement.
- Specify the secondary external timing source by using the **secondary (external-a | external-b)** statement.

#### Related Documentation

- [Synchronizing Internal Stratum 3 Clock to External Clock Sources on PTX Series Routers on page 308](#)

## Configuring Clock Synchronization Interface on MX Series Routers

MX Series routers support external clock synchronization for Synchronous Ethernet, T1 or E1 line timing sources, and external inputs. Configuring external clock synchronization requires making clock selection, quality level, and priority considerations. The clock source selection algorithm is used to pick the two best upstream clock sources from among the

various sources on the basis of system configuration and execution criteria such as quality level, priority, and hardware restrictions. For information about the clock synchronization options, see [“Understanding Clock Synchronization” on page 263](#).

The following sections explain configuring clock synchronization options for MX Series routers:



**NOTE:**

Starting with Junos OS Release 13.3, the following scenarios occur when you configure Synchronous Ethernet without the `clock-class-to-quality-level-mapping` statement at the `[edit protocols ptp slave]` hierarchy level:

- Qualified clock source quality level (that is the secondary clock source quality level) is transmitted out of the external interface and the Ethernet interface during clock reference switchover when two clock sources on different MICs of the same FPC exist or when two clock sources on two different FPCs exist.
- Lower quality level is transmitted out the external interface and the Ethernet interface during clock reference switchover when two clock sources on the same MIC of an FPC exist due to hardware limitation.

Before you remove the SCBE from the router, you must delete the configuration under the `[edit chassis synchronization]` hierarchy level. Similarly, before you remove the SCBE2 from the router, you must delete the configuration under the `[edit chassis synchronization]` hierarchy level.

On SCBE2, the external-0/0 interface is located on SCB0 and the external-1/0 interface is located on SCB1.

- 
- [Configuring Clock Synchronization Options on page 294](#)
  - [Display the External Clock Synchronization Configuration for SCB on page 301](#)
  - [Display the External Clock Synchronization Configuration for SCBE on page 302](#)
  - [Display the External Clock Synchronization Configuration for SCBE2 on page 303](#)
  - [Displaying the External Clock Synchronization Configuration for MX2020 Control Board on page 305](#)

## Configuring Clock Synchronization Options

To configure the clock synchronization options.

1. In configuration mode, go to the `[edit chassis synchronization]` hierarchy level.

```
[edit]  
user@host# edit chassis synchronization
```

2. Configure the Synchronous Ethernet clock selection mode as auto-select or free-run.



```
[edit chassis synchronization]
user@host# set clock-mode (auto-select | free-run)
```

3. Configure the ESMC transmit parameters on all the interfaces or on selected interfaces.

```
[edit chassis synchronization]
user@host# set esmc-transmit interfaces (all | interface-name)
```

4. Configure the hold interval as configuration-change, which is the wait time (from 15 seconds through 60 seconds) after a change in configuration; restart, which is the wait time (from 60 seconds through 180 seconds) after reboot of the router; and switchover, which is the switchover wait time (from 30 seconds through 60 seconds) after clock recovery.

```
[edit chassis synchronization]
user@host# set hold-interval configuration-change secs
user@host# set hold-interval restart secs
user@host# set hold-interval switchover secs
```

5. Configure the options for the external interfaces on the basis of the type of Enhanced Switch Control Board on your MX Series router.

The SCBE has only one external interface. Configure the following options for SCBE:

- a. Go to the **[edit chassis synchronization interfaces external]** hierarchy level.

```
[edit chassis synchronization]
user@host# edit interfaces external
```

- b. Configure all the E1 interface-specific options—the **framing** statement as g704 or g704-no-crc, the **line-encoding** statement as ami or hdb3, and the **sabit** statement from 4 bits through 8 bits.

```
[edit chassis synchronization interfaces external]
user@host# set e1-options framing (g704 | g704-no-crc)
user@host# set e1-options line-encoding (ami | hdb3)
user@host# set e1-options sabit bit
```

- c. Configure the **pulse-per-second-enable** statement to enable the pulse per second (PPS) signal to be received on the GPS interface.

```
[edit chassis synchronization interfaces external]
user@host# set pulse-per-second-enable
```

- d. Configure the frequency for the provided reference clock as 1 MHz, 5 MHz, 10 MHz, 2048 kHz, e1, or t1.

```
[edit chassis synchronization interfaces external]
user@host# set signal-type (1hz | 5mhz | 10mhz | 2048khz | e1 | t1)
```

- e. Configure the T1 interface-specific options—the **framing** statement as **esf** or **sf** and the **line-encoding** statement as **ami** or **b8zs**.

```
[edit chassis synchronization interfaces external]
user@host# set t1-options framing (esf | sf)
user@host# set t1-options line-encoding (ami | b8zs)
```

The SCBE2 Control Board has two external interfaces—external-0/0 and external-1/0. Configure the following options for SCBE2 Control Board:

- a. Go to the **[edit chassis synchronization interfaces external-0/0]** or **[edit chassis synchronization interfaces external-1/0]** hierarchy level.

```
[edit chassis synchronization]
user@host# edit interfaces external-0/0
```

OR

```
[edit chassis synchronization]
user@host# edit interfaces external-1/0
```

- b. Configure all the E1 interface-specific options—the **framing** statement as **g704** or **g704-no-crc**, the **line-encoding** statement as **ami** or **hdb3**, and the **sabit** statement from 4 bits through 8 bits—on the external-0/0 interface or the external-1/0 interface.

```
[edit chassis synchronization interfaces (external-0/0 | external-1/0)]
user@host# set e1-options framing (g704 | g704-no-crc)
user@host# set e1-options line-encoding (ami | hdb3)
user@host# set e1-options sabit bit
```

- c. Configure the **pulse-per-second-enable** statement to enable the pulse per second (PPS) signal to be received on the GPS interface of the router.

```
[edit chassis synchronization interfaces (external-0/0 | external-1/0)]
user@host# set pulse-per-second-enable
```

- d. Configure the frequency for the provided reference clock as 1 MHz, 5 MHz, 10 MHz, 2048 kHz, e1, or t1.

```
[edit chassis synchronization interfaces (external-0/0 | external-1/0)]
user@host# set signal-type (1hz | 5mhz | 10mhz | 2048khz | e1 | t1)
```

- e. Configure the T1 interface-specific options—the **framing** statement as **esf** or **sf** and the **line-encoding** statement as **ami** or **b8zs**.

```
[edit chassis synchronization interfaces (external-0/0 | external-1/0)]
user@host# set t1-options framing (esf | sf)
user@host# set t1-options line-encoding (ami | b8zs)
```

The MX2020 Control Board has two external interfaces—external-a and external-b. Configure the following options for MX2020 Control Board:

- a. Go to the **[edit chassis synchronization interfaces external-a]** or **[edit chassis synchronization interfaces external-b]** hierarchy level.

```
[edit chassis synchronization]
user@host# edit interfaces external-a
```

OR

```
[edit chassis synchronization]
user@host# edit interfaces external-b
```

- b. For BITS interface, configure all the E1 interface-specific options—the **framing** statement as **g704** or **g704-no-crc**, the **line-encoding** statement as **ami** or **hdb3**, and the **sabit** statement from 4 bits through 8 bits—on the external-a interface or the external-b interface.

```
[edit chassis synchronization interfaces (external-a | external-b)]
user@host# set e1-options framing (g704 | g704-no-crc)
user@host# set e1-options line-encoding (ami | hdb3)
user@host# set e1-options sabit bit
```

- c. Configure the **pulse-per-second-enable** statement to enable the pulse per second (PPS) signal to be received on the GPS interface of the router.

```
[edit chassis synchronization interfaces (external-a | external-b)]
user@host# set pulse-per-second-enable
```

- d. Configure the frequency for the provided reference clock as 1 MHz, 5 MHz, or 10 MHz for GPS interface and 2048 kHz, e1, or t1 for BITS interface.

```
[edit chassis synchronization interfaces (external-a | external-b)]
user@host# set signal-type (1hz | 5mhz | 10mhz | 2048khz | e1 | t1)
```

- e. For BITS interface, configure the T1 interface-specific options—the **framing** statement as **esf** or **sf** and the **line-encoding** statement as **ami** or **b8zs**.

```
[edit chassis synchronization interfaces (external-a | external-b)]
user@host# set t1-options framing (esf | sf)
```

```
user@host# set t1-options line-encoding (ami | b8zs)
```

6. Configure the maximum transmit quality level as prc, prs, sec, ssu-a, ssu-b, st2, st3e, stu, or tnc.

```
[edit chassis synchronization]
user@host# set max-transmit-quality-level (prc | prs | sec | ssu-a | ssu-b | st2 | st3e |
stu | tnc)
```

7. Configure the EEC synchronization networking type as option-1 or option-2.

```
[edit chassis synchronization]
user@host# set network-option (option-1 | option-2)
```

8. Configure the options for the external clock interface output on the basis of the type of Enhanced Switch Control Board on your MX Series router.

For SCBE:

- a. Go to the **[edit chassis synchronization output interfaces external]** hierarchy level.

```
[edit chassis synchronization]
user@host# edit output interfaces external
```

- b. Configure all the external clock interface output options. The options include the **holdover-mode-disable** statement; the **minimum-quality** statement, which can be set as prc, prs, sec, ssu-a, ssu-b, st2, st3e, stu, or tnc; the **source-mode** statement, which can be set as chassis or line; the **tx-dnu-to-line-source-enable** statement; and the **wander-filter-disable** statement.

```
[edit chassis synchronization output interfaces external]
user@host# set holdover-mode-disable
user@host# set minimum-quality (prc | prs | sec | ssu-a | ssu-b | st2 | st3e | stu |
tnc)
user@host# set source-mode (chassis | line)
user@host# set tx-dnu-to-line-source-enable
user@host# set wander-filter-disable
```

For SCBE2:

- a. Go to the **[edit chassis synchronization output interfaces external-0/0]** hierarchy level or the **[edit chassis synchronization output interfaces external-1/0]** hierarchy level.

```
[edit chassis synchronization]
user@host# edit output interfaces (external-0/0 | external-1/0)
```

- b. Configure all the external clock interface output options on the external-0/0 interface or the external-1/0 interface. The options include the **holdover-mode-disable** statement; the **minimum-quality** statement, which can be set as prc, prs, sec, ssu-a, ssu-b, st2, st3e, stu, or tnc; the **source-mode** option, which can be set as chassis or line; the **tx-dnu-to-line-source-enable** statement; and the **wander-filter-disable** statement.

```
[edit chassis synchronization output interfaces (external-0/0 | external-1/0)]
user@host# set holdover-mode-disable
user@host# set minimum-quality (prc | prs | sec | ssu-a | ssu-b | st2 | st3e | stu |
tnc)
user@host# set source-mode (chassis | line)
user@host# set tx-dnu-to-line-source-enable
user@host# set wander-filter-disable
```

For MX2020 Control Board:

- a. Go to the **[edit chassis synchronization output interfaces external-a]** hierarchy level or the **[edit chassis synchronization output interfaces external-b]** hierarchy level.

```
[edit chassis synchronization]
user@host# edit output interfaces (external-a | external-b)
```

- b. Configure all the external clock interface output options on the external-a interface or the external-b interface. The options include the **holdover-mode-disable** statement; the **minimum-quality** statement, which can be set as prc, prs, sec, ssu-a, ssu-b, st2, st3e, stu, or tnc; the **source-mode** option, which can be set as chassis or line; the **tx-dnu-to-line-source-enable** statement; and the **wander-filter-disable** statement.

```
[edit chassis synchronization output interfaces (external-a | external-b)]
user@host# set holdover-mode-disable
user@host# set minimum-quality (prc | prs | sec | ssu-a | ssu-b | st2 | st3e | stu |
tnc)
user@host# set source-mode (chassis | line)
user@host# set tx-dnu-to-line-source-enable
user@host# set wander-filter-disable
```

9. Configure the time-of-day message format as ASCII on the auxiliary port that receives the external clock signals.

```
[edit chassis synchronization]
user@host# set port auxiliary client time-of-day-format ascii string
```

10. Configure the **quality-mode-enable** statement to enable Synchronous Ethernet ESMC quality mode.

```
[edit chassis synchronization]
user@host# set quality-mode-enable
```

11. Configure the selection mode for the incoming ESMC quality as configured-quality or received-quality.

```
[edit chassis synchronization]
user@host# set selection-mode (configured-quality | received-quality)
```

12. Configure the options for the ESMC source related external clock source interface on the basis of the type of Enhanced Switch Control Board on your MX Series router.

For SCBE:

- a. Go to the **[edit chassis synchronization source interfaces external]** hierarchy level or the **[edit chassis synchronization source interfaces *ethernet-interface-name*]** hierarchy level.

```
[edit chassis synchronization]
user@host# edit source interfaces external
```

OR

```
[edit chassis synchronization]
user@host# edit source interfaces ethernet-interface-name
```

- b. Configure the external clock interface and the Ethernet interface with their options. Configure the **priority** statement from 1 through 5; the **quality-level** statement as prc, prs, sec, ssu-a, ssu-b, st2, st3e, stu, or tnc; the **request** statement as force-switch or lockout; the **wait-to-restore** statement from 0 minutes to 12 minutes; and the **hold-off-time** statement from 300 through 1800 milliseconds. You can configure the same options for the Ethernet interfaces as well.

```
[edit chassis synchronization source interfaces (external | ethernet-interface-name)]
user@host# set priority value
user@host# set quality-level (prc | prs | sec | ssu-a | ssu-b | st2 | st3e | stu | tnc)
user@host# set request (force-switch | lockout)
user@host# set wait-to-restore minutes
user@host# set hold-off-time time
```

For SCBE2 Control Board:

- a. Go to the **[edit chassis synchronization source interfaces (external-0/0)]** hierarchy level or the **[edit chassis synchronization source interfaces (external-1/0)]** hierarchy level.

```
[edit chassis synchronization]
user@host# edit source interfaces external-0/0
```

OR

```
[edit chassis synchronization]
user@host# edit source interfaces external-1/0
```

- b. Configure the options on the external-0/0 interface or the external-1/0 interface. Set the **priority** statement from 1 through 5; the **quality-level** statement as prc, prs, sec, ssu-a, ssu-b, st2, st3e, stu, or tnc; the **request** statement as force-switch or lockout; the **wait-to-restore** statement from 0 minutes to 12 minutes; and the **hold-off-time** statement from 300 through 1800 milliseconds.

```
[edit chassis synchronization source interfaces (external-0/0 | external-1/0)]
user@host# set priority value
user@host# set quality-level (prc | prs | sec | ssu-a | ssu-b | st2 | st3e | stu | tnc)
user@host# set request (force-switch | lockout)
user@host# set wait-to-restore minutes
user@host# set hold-off-time time
```

For MX2020 Control Board:

- a. Go to the [edit chassis synchronization source interfaces (external-a)] hierarchy level or the [edit chassis synchronization source interfaces (external-b)] hierarchy level.

```
[edit chassis synchronization]
user@host# edit source interfaces external-a
```

OR

```
[edit chassis synchronization]
user@host# edit source interfaces external-b
```

- b. Configure the options on the external-a interface or the external-b interface. Set the **priority** statement from 1 through 5; the **quality-level** statement as prc, prs, sec, ssu-a, ssu-b, st2, st3e, stu, or tnc; the **request** statement as force-switch or lockout; the **wait-to-restore** statement from 0 minutes to 12 minutes; and the **hold-off-time** statement from 300 through 1800 milliseconds.

```
[edit chassis synchronization source interfaces (external-a | external-b)]
user@host# set priority value
user@host# set quality-level (prc | prs | sec | ssu-a | ssu-b | st2 | st3e | stu | tnc)
user@host# set request (force-switch | lockout)
user@host# set wait-to-restore minutes
user@host# set hold-off-time time
```

13. Configure the switchover mode as revertive or non-revertive.

```
[edit chassis synchronization]
user@host# set switchover-mode (non-revertive | revertive)
```

## Display the External Clock Synchronization Configuration for SCB

**Purpose** Display the options for external clock synchronization for SCB.

**Action** Execute the **show** command at **[edit chassis]** hierarchy level.

```
[edit chassis]
user@host# show
synchronization {
  clock-mode (auto-select | free-run);
  esmc-transmit {
    interfaces (all | <interface-name>);
  }
  hold-interval {
    configuration-change <seconds>;
    restart <seconds>;
    switchover <seconds>;
  }
  interfaces <interface-name> {
    hold-off-time <time>;
    priority <number>;
    quality-level (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3 | st3e |
st4 | stu | tnc);
    request (force-switch | lockout);
    wait-to-restore <minutes>;
  }
}
max-transmit-quality-level (prc | prs | sec | ssu-a | ssu-b | st2 | st3e | stu
| tnc); # Applicable from 13.3 onwards
network-type (option-1 | option-2);
quality-mode-enable;
selection-mode (configured-quality | received-quality);
source {
  (external-a | external-b) {
    priority <number>;
    quality-level (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3 | st3e |
st4 | stu | tnc);
    request (force-switch | lockout);
  }
  switchover-mode (revertive | non-revertive);
}
```

## Display the External Clock Synchronization Configuration for SCBE

**Purpose** Display the options for external clock synchronization for SCBE. Note that the SCBE has only one external interface.

**Action** Execute the **show** command at **[edit chassis]** hierarchy level.

```
[edit chassis]
user@host# show
synchronization {
  clock-mode (auto-select | free-run);
  esmc-transmit {
    interfaces (all | <interface-name>);
  }
  hold-interval {
    configuration-change <seconds>;
    restart <seconds>;
```



```

        switchover <seconds>;
    }
    interfaces {
        external {
            e1-options {
                framing (g704 | g704-no-crc4);
                line-encoding (ami | hdb3);
                sabit <number>;
            }
            pulse-per-second-enable;
            signal-type (1mhz | 5mhz | 10mhz | 2048khz | t1 | e1);
            t1-options {
                framing (esf | sf);
                line-encoding (ami | b8zs);
            }
        }
    }
    max-transmit-quality-level (prc | prs | sec | ssu-a | ssu-b | st2 | st3e | stu
| tnc); # Applicable from 13.3 onwards
    network-option (option-1 | option-2);
    output {
        interfaces {
            external {
                holdover-mode-disable;
                minimum-quality (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3
| st3e | st4 | stu | tnc);
                source-mode (chassis | line);
                tx-dnu-to-line-source-enable;
                wander-filter-disable;
            }
        }
    }
    port {
        auxiliary client {
            time-of-day-format {
                ascii <string>;
            }
        }
    }
    quality-mode-enable;
    selection-mode (configured-quality | received-quality);
    source {
        interfaces (<interface-name> | external) {
            hold-off-time <time>;
            priority <number>;
            quality-level (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3 |
st3e | st4 | stu | tnc);
            request (force-switch | lockout);
            wait-to-restore <minutes>;
        }
    }
    switchover-mode (revertive | non-revertive);
}

```

## Display the External Clock Synchronization Configuration for SCBE2

**Purpose** Display the options for external clock synchronization for SCBE2. SCBE2 has two external interfaces, external-0/0 and external-1/0.

**Action** Execute the show command at **[edit chassis]** hierarchy level.

```
[edit chassis]
user@host# show
synchronization {
  clock-mode (auto-select | free-run);
  esmc-transmit {
    interfaces (all | <interface-name>);
  }
  hold-interval {
    configuration-change <seconds>;
    restart <seconds>;
    switchover <seconds>;
  }
  interfaces {
    (external-0/0 | external-1/0) {
      signal-type (1mhz | 5mhz | 10mhz | 2048khz | t1 | e1);
      e1-options {
        framing (g704 | g704-no-crc4);
        line-encoding (ami | hdb3);
        sabit <number>;
      }
      pulse-per-second-enable;
      t1-options {
        framing (esf | sf);
        line-encoding (ami | b8zs);
      }
    }
  }
  max-transmit-quality-level (prc | prs | sec | ssu-a | ssu-b | st2 | st3e | stu
| tnc);
  network-option (option-1 | option-2);
  output {
    interfaces {
      (external-0/0 | external-1/0) {
        holdover-mode-disable;
        minimum-quality (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3
| st3e | st4 | stu | tnc);
        source-mode (chassis | line);
        tx-dnu-to-line-source-enable;
        wander-filter-disable;
      }
    }
  }
  port {
    auxiliary client {
      time-of-day-format {
        ascii <string>;
      }
    }
  }
  quality-mode-enable;
  selection-mode (configured-quality | received-quality);
  source {
    interfaces {
      (external-0/0 | external-1/0 | <interface-name>) {
        hold-off-time <time>;
        priority <number>;
        quality-level (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3
| st3e | st4 | stu | tnc);
```

```

        request (force-switch | lockout);
        wait-to-restore <minutes>;
    }
}
switchover-mode (revertive | non-revertive);
}

```

## Displaying the External Clock Synchronization Configuration for MX2020 Control Board

**Purpose** Display the options for external clock synchronization for MX2020 Control Board. MX2020 Control Board has two external interfaces, external-a and external-b.

**Action** Execute the show command at [edit chassis] hierarchy level.

```

[edit chassis]
user@host# show
synchronization {
    clock-mode (auto-select | free-run);
    esmc-transmit {
        interfaces (all | <interface-name>);
    }
    hold-interval {
        configuration-change <seconds>;
        restart <seconds>;
        switchover <seconds>;
    }
    interfaces {
        (external-a | external-b) {
            signal-type (1mhz | 5mhz | 10mhz | 2048khz | t1 | e1);
            e1-options {
                framing (g704 | g704-no-crc4);
                line-encoding (ami | hdb3);
                sabit <number>;
            }
            pulse-per-second-enable;
            t1-options {
                framing (esf | sf);
                line-encoding (ami | b8zs);
            }
        }
    }
    max-transmit-quality-level (prc | prs | sec | ssu-a | ssu-b | st2 | st3e
| stu | tnc);
    network-option (option-1 | option-2);
    output {
        interfaces {
            (external-a | external-b) {
                holdover-mode-disable;
                minimum-quality (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3
| st3e | st4 | stu | tnc);
                source-mode (chassis | line);
                tx-dnu-to-line-source-enable;
                wander-filter-disable;
            }
        }
    }
    port {

```

```

    auxiliary client {
        time-of-day-format {
            ascii <string>;
        }
    }
}
quality-mode-enable;
selection-mode (configured-quality | received-quality);
source {
    interfaces {
        (external-a | external-b | <interface-name>) {
            hold-off-time <time>;
            priority <number>;
            quality-level (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3
| st3e | st4 | stu | tnc);
            request (force-switch | lockout);
            wait-to-restore <minutes>;
        }
    }
    switchover-mode (revertive | non-revertive);
}

```

#### Related Documentation

- [Centralized Clocking Overview on page 232](#)
- [Example: Configuring Synchronous Ethernet on MX Series Routers on page 311](#)
- [request chassis synchronization mode on page 910](#)
- [show chassis synchronization \(MX Series Routers\) on page 2161](#)
- [synchronization on page 794](#)
- [Understanding Clock Synchronization on page 263](#)

## Clock Sources for PTX Series Packet Transport Routers

System clocking on PTX Series Packet Transport Routers is controlled by a Centralized Clock Generator (CCG). The CCG is capable of deriving a master clock from a valid source and synchronizing all interfaces on the chassis to this master clock. The CCG plugs into the rear of the chassis. A pair of CCGs installed in the chassis provide a redundant fallback option.

Synchronous Ethernet is configured on external primary and secondary interfaces that use building-integrated timing system (BITS), SDH Equipment Timing Source (SETS) timing sources, or an equivalent quality timing source such as GPS. On the PICs, the transmit clock of the interface is synchronized to a BITS or SETS timing source and is traceable to the timing source within the network.

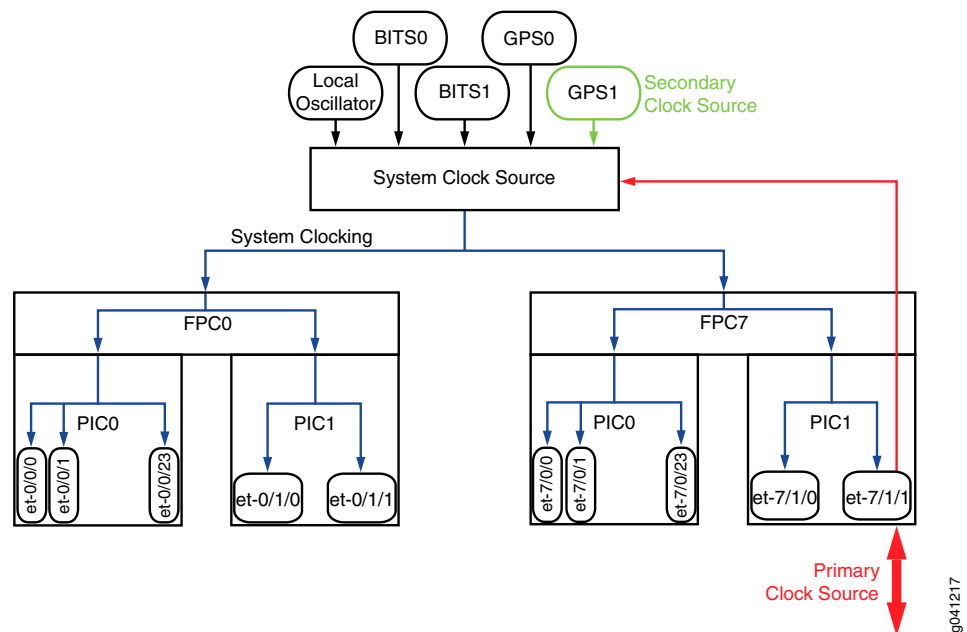
PTX Series Packet Transport Routers can use an internal clock source or it can extract clocking from an external source.

Clock sources and specifications include:

- The PTX Series Packet Transport Router clock is a Stratum 3E-compliant clock with Free Run +/- 4.6 ppm/20 years, Holdover +/- 0.01 ppm/24 hours, and Drift +/- 0.001 ppm/24 hours.
- The internal clock is based on Freerun OCXO with +/- 10 ppb accuracy.
- External clocking includes a choice of GPS-based clock recovery (5 MHz and 10 MHz) or BITS-T1/E1 Line synchronization (1.544 MHz and 2.048 MHz).
- Synchronous Ethernet is supported based on the ITU-T G.8261, ITU-T G.8262, and ITU-T G.8264 specifications with line timing from the 10-Gigabit Ethernet, 40-Gigabit Ethernet, or 100-Gigabit Ethernet interface.

Synchronous Ethernet is a key requirement for circuit (emulation) services and mobile radio access technologies. Synchronous Ethernet supports sourcing and transfer of frequency for synchronization purposes for both wireless and wireline services and is primarily used for mobile backhaul and converged transport.

*Figure 7: Clocking Example for PTX Series Packet Transport Routers*



In this example, the interface et-7/1/1 is configured as the primary clock source and GPS1 as the secondary clock source.

Note that you can specify the primary and secondary clock sources provided that the clock source meets the necessary qualification as set by the clock algorithm. However, in the absence of any user-selected clock source, the clock source with the best quality level is selected by the clock algorithm in the router. Note that the user selection is honored even when better quality level clock sources are available. You can select the clock source with the **request chassis synchronization switch clock-source** operational mode command. For more information, see [request chassis synchronization switch](#).



**NOTE:** The clock sources used as primary or secondary clock sources cannot originate from the same FPC.

For more information about clock source ports, see *PTX3000 Clocking Port Cable Specifications and Pinouts*, *PTX5000 Centralized Clock Generator Description*, and *Connecting the PTX5000 to an External Clocking Device*.

#### Related Documentation

- [Synchronizing Internal Stratum 3 Clock to External Clock Sources on PTX Series Routers on page 308](#)
- [recovered-clock on page 759](#)
- [synchronization \(PTX Series\) on page 802](#)

## Synchronizing Internal Stratum 3 Clock to External Clock Sources on PTX Series Routers

The PTX Series Packet Transport Routers support an external synchronization interface that can be configured to synchronize the internal Stratum 3 clock to an external source, and then synchronize the chassis interface clock to that source. You can also configure a primary and a secondary clock source.

The following tasks explain how to configure a recovered clock for an FPC and to configure the clock synchronization options:

- [Configuring a Recovered Clock for an FPC on page 308](#)
- [Configuring External Clock Synchronization Options on page 308](#)

### Configuring a Recovered Clock for an FPC

To configure a recovered clock for an FPC on PTX Series routers:

1. Go to the `[edit chassis fpc slot-number pic pic-number]` hierarchy level.

```
[edit]
user@host# edit chassis fpc slot-number pic pic-number
```

2. Configure a port from 0 through 47 through which the clock is recovered.

```
[edit]
user@host# set recovered-clock port port-number
```

### Configuring External Clock Synchronization Options



**NOTE:** Starting with Junos OS Release 15.1F3, you must configure a recovered clock (`recovered-clock port port-number`) for an interface before configuring clock synchronization options for the same interface.

Use the **synchronization** statement options to specify a primary and a secondary timing source. To do this, you must configure the following options:

- Specify the switching mode as **revertive** when a lower-priority synchronization source is to be switched to a valid, higher-priority synchronization source.
- Specify the primary external timing source with the **primary (fpc-slot-number | gps-0 | gps-1 | bits-a | bits-b)** statement.
- Specify the secondary external timing source with the **secondary (fpc-slot-number | gps-0 | gps-1 | bits-a | bits-b)** statement.



**NOTE:** For more information about clock synchronization options, see [“Understanding Clock Synchronization” on page 263](#).

To configure the clock synchronization options:

1. In configuration mode, go to the **[edit chassis synchronization]** hierarchy level.

```
[edit]
user@host# edit chassis synchronization
```

2. Configure the Synchronous Ethernet clock selection mode as *auto-select* to select the best external clock source or *free-run* to use the free-running local oscillator as a clock source.

```
[edit chassis synchronization]
user@host# set clock-mode (auto-select | free-run)
```

3. Configure the ESMC transmit parameters on all the interfaces or on selected interfaces.

```
[edit chassis synchronization]
user@host# set esmc-transmit interfaces (all | interface-name)
```

4. Configure the hold interval as configuration-change, which is the wait time (from 15 seconds through 60 seconds) after a change in configuration; restart, which is the wait time (from 60 seconds through 180 seconds) after reboot of the router; and switchover, which is the switchover wait time (from 30 seconds through 60 seconds) after clock recovery.

```
[edit chassis synchronization]
user@host# set hold-interval configuration-change secs
user@host# set hold-interval restart secs
user@host# set hold-interval switchover secs
```

5. Configure the interface with an available upstream clock source where the clock source is bits-a, bits-b, gps-0, or gps-1. Configure the **pulse-per-second-enable**

statement to enable the pulse per second (PPS) signal to be received on the GPS interface and configure the frequency for the provided reference clock as 5 MHz, 10 MHz, e1, or t1.

```
[edit chassis synchronization]
user@host# set interfaces (bits-a | bits-b | gps-0 | gps-1) (pulse-per-second-enable
| signal-type (5mhz | 10mhz | e1 | t1))
```

6. Configure the maximum transmit quality level as prc, prs, sec, ssu-a, ssu-b, st2, st3e, stu, or tnc.

```
[edit chassis synchronization]
user@host# set max-transmit-quality-level (prc | prs | sec | ssu-a | ssu-b | st2 | st3e |
stu | tnc)
```

7. Configure the EEC synchronization networking type as option-1 to map to G.813 option 1 (EEC1) or option-2 to map to G.812 type IV clock (EEC1).

```
[edit chassis synchronization]
user@host# set network-option (option-1 | option-2)
```

8. Configure the primary synchronization reference source as bits-a, bits-b, gps-0, gps-1, fpc-0, fpc-1, fpc-2, fpc-3, fpc-4, fpc-5, fpc-6, or fpc-7. The selected source is considered to be the best choice among the available sources.

```
[edit chassis synchronization]
user@host# set primary (fpc-slot-number | gps-0 | gps-1 | bits-a | bits-b)
```

9. Configure the **quality-mode-enable** statement to enable Synchronous Ethernet ESMC quality mode.

```
[edit chassis synchronization]
user@host# set quality-mode-enable
```

10. Configure the secondary synchronization reference source as bits-a, bits-b, gps-0, gps-1, fpc-0, fpc-1, fpc-2, fpc-3, fpc-4, fpc-5, fpc-6, or fpc-7. The selected source is considered to be the best alternative among the available sources.

```
[edit chassis synchronization]
user@host# set secondary (fpc-slot-number | gps-0 | gps-1 | bits-a | bits-b)
```

11. Configure the quality selection mode for the incoming ESMC packets as configured-quality or received-quality.

```
[edit chassis synchronization]
user@host# set selection-mode (configured-quality | received-quality)
```



12. Configure the ESMC source as bits-a, bits-b, gps-0, or gps-1. For the configured source, configure the **priority** statement from 1 through 5; the **quality-level** statement as prc, prs, sec, ssu-a, ssu-b, st2, st3e, stu, or tnc; the **request** statement as force-switch or lockout.

```
[edit chassis synchronization]
user@host# source (bits-a | bits-b | gps-0 | gps-1) (priority number | quality-level (prc |
  prs | sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc) | request (force-switch |
  lockout)
```

13. Configure the switchover mode as revertive or non-revertive.

```
[edit chassis synchronization]
user@host# set switchover-mode (non-revertive | revertive)
```



**NOTE:** To configure the Synchronous Ethernet clock sources, you must configure network-option *option*, quality-mode-enable, and source interfaces *interface-name* priority *value* quality-level *level* along with other parameters as needed at the [edit chassis synchronization] hierarchy level.

To configure ESMC transmit interface, you must configure esmc-transmit interface *interface-name* along with other parameters as needed at the [edit chassis synchronization] hierarchy level.

Release History Table

Release	Description
15.1F3	Starting with Junos OS Release 15.1F3, you must configure a recovered clock ( <b>recovered-clock port</b> <i>port-number</i> ) for an interface before configuring clock synchronization options for the same interface.

#### Related Documentation

- [Clock Sources for PTX Series Packet Transport Routers on page 306](#)
- [Understanding Clock Synchronization on page 263](#)
- [recovered-clock on page 759](#)
- [synchronization on page 802](#)

### Example: Configuring Synchronous Ethernet on MX Series Routers

- [Requirements on page 312](#)
- [Overview on page 312](#)
- [Configuration on page 312](#)
- [Verification on page 314](#)

## Requirements

This example uses the following hardware and software components:

- One MX80-T, MX5-T, MX10-T, MX40-T, MX80, MX240, MX480, or MX960 router
- Junos OS Release 10.4 or later for MX80 Universal Routing Platforms and 11.2R4 or later for MX80-T, MX5, MX10, MX40, MX240, MX480, and MX960 routers.

## Overview

You can configure Synchronous Ethernet on MX5-T, MX10-T, MX40-T, MX80, MX80-T, MX240, MX480, and MX960 routers, which enables you to synchronize clocks between nodes in a network through frequency synchronization.



**NOTE:** You can set the values for each parameter according to your requirement. The values given in this example are for illustration purposes only.

## Configuration

### CLI Quick Configuration

To quickly configure synchronization on the aforementioned routers, copy the following commands, paste them in a text file, remove any line breaks, and then copy and paste the commands into the CLI.

[edit]

```
set chassis synchronization clock-mode auto-select
set chassis synchronization network-type option-1
set chassis synchronization quality-mode-enable
set chassis synchronization selection-mode configured-quality
set chassis synchronization switchover-mode revertive
set chassis synchronization hold-interval configuration-change 1 restart 1 switchover 1
set chassis synchronization esmc-transmit interfaces ge-2/0/0
set chassis synchronization source external-a priority 2 quality-level prc request
force-switch
set chassis synchronization interfaces ge-2/0/0 priority 1 quality-level prc request
force-switch wait-to-restore 1
```

**Step-by-Step Procedure** The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

For step-by-step configuration, see [“Configuring Clock Synchronization Interface on MX Series Routers” on page 293](#).

To configure Synchronous Ethernet, perform the following tasks:

1. Configure the clock mode, network type, quality mode, selection mode, and switchover mode.

```
[edit chassis synchronization]
user@host# set clock-mode auto-select network-type option-1 quality-mode-enable
selection-mode configured-quality switchover-mode revertive
```

2. Configure the hold interval for configuration change, restart interval, and the switchover interval in seconds.

```
[edit chassis synchronization]
user@host# set hold-interval configuration-change 1 restart 1 switchover 1
```

3. Configure the interfaces for transmitting ESMC.

```
[edit chassis synchronization]
user@host# set esmc-transmit interfaces ge-2/0/0
```

4. Configure the source node with its quality level, priority, and request type.

```
[edit chassis synchronization]
user@host# set source external-a priority 2 quality-level prc request force-switch
```

5. Configure the interfaces with priority, quality level, request type, and time to restore the interface to default.

```
[edit chassis synchronization]
user@host# set interfaces ge-2/0/0 priority 1 quality-level prc request force-switch
wait-to-restore 1
```

**Results** Display the results of the configuration:

```
user@host# show chassis
synchronization {
  clock-mode (auto-select | free-run);
  esmc-transmit {
    interfaces (all | interface-name);
  }
}
```

```
hold-interval {
  configuration-change seconds;
  restart seconds;
  switchover seconds;
}
network-type (option-1 | option-2);
quality-mode-enable;
selection-mode (configured-quality|received-quality);
switchover-mode (revertive | non-revertive);
source {
  (external-a | external-b) {
    priority number;
    quality-level (prc | prs |sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc);
    request (force-switch | lockout);
  }
  interfaces interface-name {
    priority number;
    quality-level (prc | prs |sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc);
    request (force-switch | lockout);
    wait-to-restore minutes;
  }
}
}
```

## Verification

Confirm that the configuration is working properly.

- [Verifying the Basic Parameters for Synchronization on page 314](#)
- [Verifying All the Parameters for Synchronization on page 314](#)
- [Verifying the Global Configuration on page 315](#)
- [Verifying the ESMC Transmit Parameters on page 315](#)
- [Verifying the ESMC Statistics Parameters on page 315](#)
- [Verifying That the ESMC Statistics Are Cleared on page 315](#)

---

### Verifying the Basic Parameters for Synchronization

<b>Purpose</b>	Verify that the basic synchronization parameters such as the current clock status, clock locked to, and configured sources are working as expected.
<b>Action</b>	From operational mode, enter the <b>run show chassis synchronization</b> command to display the synchronization details.
<b>Meaning</b>	The output displays the basic synchronization parameters configured on the interface.

---

### Verifying All the Parameters for Synchronization

<b>Purpose</b>	Verify that all the synchronization parameters are working as expected.
----------------	---

**Action** From operational mode, enter the **run show chassis synchronization extensive** command to display all the synchronization details.

**Meaning** The output displays all the synchronization parameters configured on the interface.

---

### Verifying the Global Configuration

---

**Purpose** Verify that all the global configuration parameters are working as expected.

**Action** From operational mode, enter the **run show synchronous-ethernet global-information** command to display the set parameters for the global configuration.

**Meaning** The output displays global information about the configured node.

---

### Verifying the ESMC Transmit Parameters

---

**Purpose** Verify that the transmission parameters of ESMC on the interface are working as expected.

**Action** From operational mode, enter the **run show synchronous-ethernet esmc transmit detail** command to display the set parameters for the ESMC transmission.

**Meaning** The output displays all the transmission details about the configured ESMC interface.

---

### Verifying the ESMC Statistics Parameters

---

**Purpose** Verify the statistics related to ESMC on the interface.

**Action** From operational mode, enter the **run show synchronous-ethernet esmc statistics** command to display the statistics for the ESMC transmission.

**Meaning** The output displays information about the ESMC statistics.

---

### Verifying That the ESMC Statistics Are Cleared

---

**Purpose** Clear the statistics related to ESMC on the interface.

**Action** From operational mode, enter the **clear synchronous-ethernet esmc statistics** command to clear the statistics for the ESMC transmission.

**Meaning** The output displays the message that the ESMC statistics have been cleared.

**Related Documentation**

- [Clock Sources for PTX Series Packet Transport Routers on page 306](#)
- [Configuring Clock Synchronization Interface on MX Series Routers on page 293](#)
- [Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 316](#)
- [request chassis synchronization mode on page 910](#)
- [show chassis synchronization \(MX Series Routers\) on page 2161](#)
- [synchronization \(MX Series\) on page 794](#)
- [Synchronous Ethernet Overview on page 242](#)

## Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC

---

- [Requirements on page 316](#)
- [Overview on page 316](#)
- [Configuration on page 317](#)

### Requirements

This example uses the following hardware and software components:

- Junos OS Release 11.4 or later for MX80-T, MX240, MX480, or MX960 routers
- One MX80-T, MX240, MX480, and MX960 router with 10-Gigabit Ethernet MIC with XFP

### Overview

You can set the framing mode at the PIC level and at the interface level with various configuration combinations. For more information about the various configuration combinations, see [“Synchronous Ethernet on 10-Gigabit Ethernet MIC Overview” on page 252](#).

This example provides information about configuring framing mode at the interface level and the PIC level for Synchronous Ethernet on the 10-Gigabit Ethernet MIC with XFP.

The 10-Gigabit Ethernet MIC with XFP supports Synchronous Ethernet in LAN-PHY framing mode. This is possible only when all the logical PICs under the given Modular Interface Card (MIC) and its ingress interfaces are configured in LAN framing mode.

You can also alternatively configure a MIC in WAN-PHY framing mode on MX80, MX240, MX480, and MX960 routers by configuring all the constituent logical PICs in the same WAN-PHY framing mode in any one of the following configurations:

- No framing mode configured on all the constituent logical PICs of the MIC.
- Incompatible framing mode configured on constituent logical PICs of the MIC.
- No framing mode configured on some of the constituent logical PICs of the MIC.



**NOTE:** By default, the PIC-level framing mode is set to WAN framing type, that is e1 | e3 | sdh | sonet | t1 | t3. Synchronous Ethernet works on 10-Gigabit Ethernet MIC with XFP in LAN-PHY mode only when the PIC level framing configuration is configured to lan framing type explicitly.

By default, the interface-level framing mode is set to lan-phy. For WAN-PHY operation, interface framing needs to be set to wan-phy framing explicitly.



**NOTE:** You can set the values for each parameter according to your requirement. The values given in this example are for illustration purposes only.

## Configuration

**CLI Quick Configuration** To quickly configure PIC-level framing and interface-level framing on the 10-Gigabit Ethernet MIC with XFP, copy the following commands and paste it into the CLI.

[edit]

```
set chassis fpc 2 pic 0 framing lan
set chassis fpc 2 pic 1 framing lan
set interfaces xe-2/1/0 framing-mode lan-phy
```

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

For step-by-step configuration of Synchronous Ethernet, see [“Configuring Clock Synchronization Interface on MX Series Routers” on page 293](#).

**Step-by-Step Procedure** To configure PIC-level framing on the 10-Gigabit Ethernet MIC with XFP, perform the following tasks:

1. In configuration mode, go to the **[edit chassis]** hierarchy level.

```
[edit]
user@host# edit chassis
```

2. Configure the FPC slot and the first PIC slot.

```
[edit chassis]
user@host# edit fpc 2 pic 0
```

3. Configure the framing type as LAN on the first PIC slot.

```
[edit chassis fpc2 pic 0]
```

```
user@host# set framing lan
```

4. Configure the FPC slot and the second PIC slot.

```
[edit chassis]
user@host# edit fpc 2 pic 1
```

5. Configure the framing type as LAN on the second PIC slot.

```
[edit chassis fpc2 pic 0]
user@host# set framing lan
```

### Step-by-Step Procedure

To configure interface-level framing on the 10-Gigabit Ethernet MIC with XFP, perform the following tasks:

1. In configuration mode, go to the **[edit interfaces]** hierarchy level and set the interface as **xe-2/1/0**.

```
[edit]
user@host# edit interfaces xe-2/1/0
```

2. Configure the interface in LAN-PHY framing mode.

```
[edit interfaces xe-2/1/0]
user@host# set framing-mode lan-phy
```

## Results

Display the results of the configuration at the PIC level:

```
[edit]
user@host# show
chassis {
  fpc 2 {
    pic 0 {
      framing lan;
    }
  }
  fpc 2 {
    pic 1 {
      framing lan;
    }
  }
}
```

Display the results of the configuration at the interface level:



```
[edit]
user@host# show
interfaces xe-2/1/0 {
  framing-mode lan-phy;
}
```

#### Related Documentation

- [Clock Sources for PTX Series Packet Transport Routers on page 306](#)
- [Configuring Clock Synchronization Interface on MX Series Routers on page 293](#)
- [request chassis synchronization mode on page 910](#)
- [show chassis synchronization \(MX Series Routers\) on page 2161](#)
- [Synchronous Ethernet Overview on page 242](#)
- [Synchronous Ethernet on 10-Gigabit Ethernet MIC Overview on page 252](#)
- [synchronization \(MX Series\) on page 794](#)

## Configuring Precision Time Protocol

You can configure the master clock and the slave clock for Precision Time Protocol (PTP) to help synchronize clocks in a distributed system. This time synchronization is achieved through packets that are transmitted and received in a session between the master clock and the slave clock.

- [Configuring Precision Time Protocol and its Options on page 319](#)

### Configuring Precision Time Protocol and its Options

This topic includes the following tasks:

1. [Configuring PTP Options on page 319](#)
2. [Configuring Slave Clock Options on page 320](#)
3. [Configuring Master Clock Options on page 323](#)

#### Configuring PTP Options

To configure PTP options:

1. In configuration mode, go to the **[edit protocols ptp]** hierarchy level:

```
[edit]
user@host# edit protocols ptp
```

2. Configure the clock mode as either boundary or ordinary. This attribute is mandatory and has no default value.

The **boundary** option signifies that the clock can be both a master clock and a slave clock. The **ordinary** option signifies that the clock is either a master clock or a slave clock.

```
[edit protocols ptp]
user@host# set clock-mode (boundary | ordinary)
```

3. Configure the PTP domain option with values from 0 through 127. The default value is 0.

```
[edit protocols ptp]
user@host# set domain domain-value
```

4. Configure the **priority1** option with values from 0 through 254. The default value is 128.  
The **priority1** value determines the best master clock. The *priority1-value* is also advertised in the master clock's announce message to other slaves.

```
[edit protocols ptp]
user@host# set priority1 priority1-value
```

5. Configure the **priority2** option with values from 0 through 255. The default value is 128.

The **priority2** value differentiates and prioritizes the master clock to avoid confusion when *priority1-value* is the same for different master clocks in a network.

```
[edit protocols ptp]
user@host# set priority2 priority2-value
```

6. Configure the **unicast-negotiation** option to enable unicast negotiation.

Unicast negotiation is a method by which the announce, sync, and delay response packet rates are negotiated between the master clock and the slave clock before a PTP session is established.

```
[edit protocols ptp]
user@host# set unicast-negotiation
```



**NOTE:** Unicast negotiation, when enabled, does not allow you to commit any packet rate–related configuration.

---

## Configuring Slave Clock Options

Configure the following options after the aforementioned PTP options have been set.

1. Configure the slave clock.

```
[edit protocols ptp]
user@host# edit slave
```

2. Configure the **announce-timeout** option in the slave node with values from 2 through 10. The default value is 3.

The announce timeout value signifies the number of times an announce interval message has to pass through the slave without receiving the announce message—that is, the timeout period for announce messages.

```
[edit protocols ptp slave]
user@host# set announce-timeout announce-timeout-value
```

3. Configure the **delay-request** option in the slave node with values from –6 through 6. The default value is –4.

The delay request value is the logarithmic mean interval in seconds between the delay request messages sent by the slave to the master.

```
[edit protocols ptp slave]
user@host# set delay-request delay-request-value
```

4. Configure the **frequency-only** option to enable only frequency synchronization in the slave.

```
[edit protocols ptp slave]
user@host# set frequency-only
```



**NOTE:** This option is configured only when PTP is used for frequency synchronization and not for phase synchronization. Also, note that this option can only be set for an ordinary clock acting as slave.

5. Configure the interface for the slave.

```
[edit protocols ptp slave]
user@host# edit interface interface-name
```

6. Configure the **unicast-mode** option for the slave. You can set this option when PTP unicast mode of messaging is needed.

```
[edit protocols ptp slave interface interface-name]
user@host# edit unicast-mode
```

7. Configure the **transport** option in unicast mode as IPv4.

The encapsulation type for PTP packet transport is IPv4.

```
[edit protocols ptp slave interface interface-name unicast-mode]
user@host# set transport ipv4
```

8. Configure the IP address of the slave.

```
[edit protocols ptp slave interface interface-name unicast-mode]
user@host# edit clock-source ip-address
```

9. Configure the IP address of the interface acting as the local PTP slave port.

```
[edit protocols ptp slave interface interface-name unicast-mode clock-source ip-address]
user@host# set local-ip-address local-ip-address
```



**NOTE:** You must configure this IP address at the [edit interfaces *interface-name*] hierarchy level.

10. You can configure PTP over IPv4 over a link aggregation group for MPC2E NG, MPC3E NG, MPC5E, MPC6E, MPC7E-10G, MPC7E-MRATE, MPC8E, and MPC9E.

For each aggregated Ethernet link configured as PTP slave, you can specify one member link of the aggregated Ethernet bundle as primary and another as secondary.

```
[edit protocols ptp slave interface interface-name ]
user@host# set primary interface-name
user@host# set secondary interface-name
```

11. Starting in Junos OS Release 15.2R1, you can configure multicast mode option for the slave port. In this mode, PTP over Ethernet uses multicast addresses and a slave port can automatically start receiving the multicast announce messages transmitted by the master ports on a network. The slave port can start communicating with the master port with minimal or no configuration.

```
[edit protocols ptp slave interface interface-name ]
user@host# set multicast-mode
```

12. Configure Ethernet as the encapsulation type of transport for the PTP packets. You can further enable 802.3 Ethernet encapsulation to use a specific set of multicast MAC addresses while transmitting the PTP packets over Ethernet.

```
[edit protocols ptp slave interface interface-name multicast-mode]
asymmetry number;
transport 802.3 link-local;
```



**NOTE:** It is mandatory to use the transport statement while configuring the multicast-mode for master and slave interfaces.

13. You can configure PTP over Ethernet over a link aggregation group for MPC5E, MPC6E, MPC7E-10G, MPC7E-MRATE, MPC8E, and MPC9E line cards.

For each aggregated Ethernet link configured as PTP slave, you can specify one member link of the aggregated Ethernet bundle as primary and another as secondary.

```
[edit protocols ptp slave interface interface-name ]
user@host# set primary interface-name
user@host# set secondary interface-name
```

### Configuring Master Clock Options

Configure the following options after the aforementioned PTP options and slave clock options have been set.

1. Configure the master clock.

```
[edit protocols ptp]
user@host# edit master
```

2. Configure the **announce interval** option for the master with values from 0 through 4. The default value is 1.

The announce interval is the logarithmic mean interval between announce messages that is sent by the master. By default, one announce message is sent in every two seconds.

```
[edit protocols ptp master]
user@host# set announce-interval announce-interval-value
```

3. Configure the **clock step** option as either one-step or two-step for the master. The default value is one-step.

The clock step determines whether the timing information is sent along with the sync message only (one-step) or a subsequent follow-up message (two-step) is sent corresponding to the previous sync message.

```
[edit protocols ptp master]
user@host# set clock-step (one-step | two-step)
```

4. Configure the **sync interval** option for the master clock with values from -6 through 6. The default value is -6.

The sync interval is the logarithmic mean interval between synchronous messages that is sent by the master. By default, 64 synchronous interval messages are sent per second.

```
[edit protocols ptp master]
user@host# set sync-interval sync-interval-value
```

5. Configure the interface for the master.

```
[edit protocols ptp master]
user@host# edit interface interface-name
```

6. Configure the unicast mode option for the master. You can set this option when PTP unicast mode of messaging is needed.

```
[edit protocols ptp master interface interface-name]
user@host# edit unicast-mode
```

7. Configure the **transport** option in unicast mode as IPv4.

The encapsulation type for PTP packet transport is IPv4.

```
[edit protocols ptp master interface interface-name unicast-mode]
user@host# set transport ipv4
```

8. Configure the IP address for the slave.

```
[edit protocols ptp master interface interface-name unicast-mode]
user@host# edit clock-client ip-address
```

9. Configure the IP address of the interface acting as the local PTP master port.

```
[edit protocols ptp master interface interface-name unicast-mode clock-client
ip-address]
user@host# set local-ip-address local-ip-address
```

10. You can configure PTP over IPv4 over a link aggregation group for MPC2E NG, MPC3E NG, MPC5E, MPC6E, MPC7E-10G, MPC7E-MRATE, MPC8E, and MPC9E.

For each aggregated Ethernet link configured as PTP master, you can specify one member link of the aggregated Ethernet bundle as primary and another as secondary.

```
[edit protocols ptp master interface interface-name ]
user@host# set primary interface-name
user@host# set secondary interface-name
```

11. Starting with Junos OS Release 15.2R1, you can configure multicast mode option for the master port. In this mode, PTP over Ethernet uses multicast addresses and a slave port can automatically start receiving the multicast announce messages transmitted by the master ports on a network. The slave port can start communicating with the master port with minimal or no configuration.

```
[edit protocols ptp master interface interface-name ]
user@host# set multicast-mode
```

12. Configure Ethernet as the encapsulation type of transport for the PTP packets. You can further enable 802.3 Ethernet encapsulation to use a specific set of multicast MAC addresses while transmitting the PTP packets over Ethernet.

```
[edit protocols ptp master interface interface-name multicast-mode]
asymmetry number;
transport 802.3 link-local;
```



**NOTE:** It is mandatory to use the `transport` statement while configuring the `multicast-mode` for master and slave interfaces.

13. You can configure PTP over Ethernet over a link aggregation group for MPC5E, MPC6E, MPC7E-10G, MPC7E-MRATE, MPC8E, and MPC9E line cards.

For each aggregated Ethernet link configured as PTP master, you can specify one member link of the aggregated Ethernet bundle as primary and another as secondary.

```
[edit protocols ptp master interface interface-name ]
user@host# set primary interface-name
user@host# set secondary interface-name
```

Release History Table

Release	Description
15.2R1	Starting in Junos OS Release 15.2R1, you can configure multicast mode option for the slave port.
15.2R1	Starting with Junos OS Release 15.2R1, you can configure multicast mode option for the master port.

**Related Documentation**

- [Precision Time Protocol Overview on page 256](#)
- [Example: Configuring Precision Time Protocol on page 325](#)

## Example: Configuring Precision Time Protocol

- [Requirements for PTP Configuration on page 325](#)
- [Overview on page 326](#)
- [Configuration on page 326](#)
- [Verification on page 328](#)

### Requirements for PTP Configuration

This example uses the following hardware and software components:

- One MX80, MX240, MX480, or MX960 router

- Junos OS Release 12.2 or later

## Overview

This example shows the configuration of Precision Time Protocol (PTP) on all Ethernet Modular Interface Cards (MICs) on the enhanced Module Port Concentrator (MPCE) MX-MPC2E-3D-P on MX240, MX480, and MX960 routers and on the MX80 Universal Routing Platforms with precision timing support (MX80-P).

PTP synchronizes clocks between nodes in a network, thereby enabling the distribution of an accurate clock over a packet switched network. This synchronization is achieved through packets that are transmitted and received in a session between the master clock and the slave clock. PTP also supports boundary clock.



**NOTE:** You can set the values for each parameter according to your requirement. The values given in this example are for illustration purposes only.

## Configuration

### CLI Quick Configuration

To quickly configure PTP on an interface, copy the following commands, paste them in a text file, remove any line breaks, and then copy and paste the commands into the CLI.

[edit]

```
set protocols ptp clock-mode boundary priority1 1 priority2 2 domain 0 unicast-negotiation
set protocols ptp slave announce-timeout 2 delay-request -4 frequency-only
set protocols ptp slave interface ge-1/2/3.0 unicast-mode transport ipv4
set protocols ptp slave interface ge-1/2/3.0 unicast-mode clock-source 2.2.2.2
local-ip-address 3.3.3.3
set protocols ptp master announce-interval 0 clock-step one-step sync-interval 0
set protocols ptp master interface ge-1/2/0.3 unicast-mode transport ipv4
set protocols ptp master interface ge-1/2/0.3 unicast-mode clock-client 10.10.1.1
local-ip-address 100.1.1.1
```

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

For step-by-step configuration, see [“Configuring Precision Time Protocol” on page 319](#).

To configure PTP, perform the following tasks:

1. Configure the clock mode, priorities, domain, and unicast negotiation options for PTP.

```
[edit protocols ptp]
user@host# set clock-mode boundary priority1 1 priority2 2 domain 0
unicast-negotiation
```



2. Configure the announce timeout, delay request, interface IP address, and encapsulation type for the slave.

```
[edit protocols ptp slave]
user@host# set announce-timeout 2 delay-request 0 interface ge-1/2/3.0 unicast-mode
transport ipv4
```

3. Configure the **clock master** option and the **local-ip-address** option for the slave node.

```
[edit protocols ptp slave interface ge-1/2/3.0 unicast-mode]
user@host# set clock-source 2.2.2.2 local-ip-address 3.3.3.3
```

4. Configure the announce interval, clock step, synchronous interval, interface IP address, and encapsulation type for the master.

```
[edit protocols ptp master]
user@host# set announce-interval 0 clock-step one-step sync-interval 0 interface
ge-1/2/3.0 unicast-mode transport ipv4
```

5. Configure the clock client for the master.

```
[edit protocols ptp master interface ge-1/2/3.0 unicast-mode]
user@host# set clock-client 10.10.1.1 local-ip-address 100.1.1.1
```

**Results** Display the results of the configuration:

```
[edit protocols ptp]
user@host# show
{
  clock-mode boundary;
  domain 0;
  priority1 1;
  priority2 2;
  unicast-negotiation;
  slave {
    announce-timeout 2;
    delay-request 0;
    frequency-only;
    interface ge-1/2/3.0 {
      unicast-mode {
        transport ipv4;
        clock-source 2.2.2.2 {
          local-ip-address 3.3.3.3;
        }
      }
    }
  }
}
master {
  announce-interval 0;
  clock-step one-step;
```

```
sync-interval 0;
interface ge-1/2/3.0 {
  unicast-mode {
    transport ipv4;
    clock-client 3.3.3.3 {
      local-ip-address 1.0.1.0;
    }
  }
}
```

## Verification

Confirm that the configuration is working properly.

- [Verifying the PTP Clock Details on page 328](#)
- [Verifying the Lock Status of the Slave on page 328](#)
- [Verifying the PTP Options on the Slave on page 329](#)
- [Verifying the PTP Options and the Current Status of the Master on page 329](#)
- [Verifying the Number and Status of the PTP Ports on page 329](#)

---

### Verifying the PTP Clock Details

<b>Purpose</b>	Verify that the PTP clock is working as expected.
<b>Action</b>	In operational mode, enter the <b>run show ptp clock</b> command to display the clock details.
<b>Meaning</b>	The output displays the clock details, which include the parameters configured on the node. For more information about the <b>run show ptp clock</b> operational command, see <a href="#">show ptp clock</a> .

---

### Verifying the Lock Status of the Slave

<b>Purpose</b>	Verify that the slave clock is aligned to the master clock by checking the lock status of the slave.
<b>Action</b>	In operational mode, enter the <b>run show ptp lock-status</b> command to display the lock status of the slave.
<b>Meaning</b>	The output displays information about the lock status of the slave. The output shows whether the slave is aligned to the master clock or not. For more information about the <b>run show ptp lock-status</b> operational command, see <a href="#">show ptp lock-status</a> .

### Verifying the PTP Options on the Slave

---

- Purpose** Verify the PTP options that are set on the slave and its current status.
- Action** In operational mode, enter the **run show ptp slave** command to display the configured slave.
- Meaning** The output displays information about the configured slave and the status of the slave. For more information about the **run show ptp slave** operational command, see [show ptp slave](#).

### Verifying the PTP Options and the Current Status of the Master

---

- Purpose** Verify the PTP options that are set for the master and its current status.
- Action** In operational mode, enter the **run show ptp master** command to display the configured options for the master.
- Meaning** The output displays information about the configured master and the current status of the master. For more information about the **run show ptp master** operational command, see [show ptp master](#).

### Verifying the Number and Status of the PTP Ports

---

- Purpose** Verify the number of PTP ports and their current status.
- Action** In operational mode, enter the **run show ptp port** command to display the configured ports.
- Meaning** The output displays information about the number of ports created according to the configuration and their current status. For each unique local IP address, one PTP port is created. For more information about the **run show ptp port** operational command, see [show ptp port](#).
- Related Documentation**
- [Configuring Precision Time Protocol on page 319](#)
  - [Precision Time Protocol Overview on page 256](#)

## Configuring Hybrid Mode and ESMC Quality Level Mapping

---

You can configure hybrid mode (that is, the combined operation of Synchronous Ethernet and Precision Time Protocol (PTP)) on MX240, MX480, and MX960 Universal Routing Platforms and on MX80 Universal Routing Platforms with precision timing support

(MX80-P) and with timing support (MX80-T). On the MX240, MX480, and MX960 routers, the combined operation is possible only when the PTP client and the Synchronous Ethernet source are on the same enhanced Modular Port Concentrator (MPC) and are traceable to the same master. When acting as a PTP slave, an MX80-P or MX80-T router can accept any external Synchronous Ethernet clock as reference. Note that when the selected Synchronous Ethernet reference fails, the router continues to work in PTP mode.

In hybrid mode, the synchronous Ethernet equipment clock (EEC) on the MPC derives the frequency from Synchronous Ethernet and the phase and time of day from PTP.

The hybrid mode is configured on the slave. On the slave, one or more interfaces are configured as Synchronous Ethernet source interfaces.

The ESMC quality level value is mapped to the clock class value either by mapping the PTP clock class to the ESMC quality level or by configuring a user-defined mapping of PTP clock class to ESMC quality level. For more information, see [“Understanding ESMC Quality Level Mapping” on page 280](#). The following procedures explain configuring hybrid mode with either of the modes in detail.

- [Configuring the Router in Hybrid Mode on page 330](#)
- [Configuring Hybrid Mode with Mapping of the PTP Clock Class to the ESMC Quality Level on page 331](#)
- [Configuring Hybrid Mode with a User-Defined Mapping of the PTP Clock Class to the ESMC Quality Level on page 332](#)

## Configuring the Router in Hybrid Mode

To configure the router in hybrid mode, you must:

1. Configure Synchronous Ethernet options at the **[edit chassis synchronization]** hierarchy level:
  - Configure the **auto-select** mode of operation. You can select the clock source either from a free-run local oscillator or from an external qualified clock.

When the router is configured with the **auto-select** option, the router chooses up to two best upstream clock sources. It then uses the clock recovered from one of the sources to lock the chassis clock. If an upstream clock with acceptable quality is not available or if the router is configured in free-run mode, the router uses the internal oscillator.
  - Configure the **esmc-transmit** and **network-option** options at the **[edit chassis synchronization]** hierarchy level.
  - Configure one or more interfaces at the **[edit chassis synchronization]** hierarchy level as Synchronous Ethernet sources as needed.
2. Configure PTP options at the **[edit protocols ptp]** hierarchy level.
3. Configure hybrid mode options at the **[edit protocols ptp slave]** hierarchy level.

## Configuring Hybrid Mode with Mapping of the PTP Clock Class to the ESMC Quality Level

To configure hybrid mode options with mapping of the PTP clock class to the ESMC quality level, perform the following steps:

1. In configuration mode, go to the **[edit protocols ptp slave]** hierarchy level:

```
[edit]
user@host# edit protocols ptp slave
```

2. Configure the **convert-clock-class-to-quality-level** option to set the default mapping between the ESMC SSM quality level and the PTP clock class.

```
[edit protocols ptp slave]
user@host# set convert-clock-class-to-quality-level
```

3. Configure the hybrid mode option on the slave.

```
[edit protocols ptp slave]
user@host# edit hybrid
```

4. Configure the Synchronous Ethernet mapping option in hybrid mode.

```
[edit protocols ptp slave hybrid]
user@host# edit synchronous-ethernet-mapping
```

5. Configure the IP address of the clock source.

```
[edit protocols ptp slave hybrid synchronous-ethernet-mapping]
user@host# edit clock-source ip-address
```

6. Configure one or more Synchronous Ethernet source interfaces for the slave as needed.

```
[edit protocols ptp slave hybrid synchronous-ethernet-mapping clock-source ip-address]
user@host# set interface interface1-name
user@host# set interface interface2-name
```



**NOTE:** You must first configure these interfaces at the **[edit chassis synchronization]** hierarchy level as Synchronous Ethernet sources. For information about configuring these interfaces, see [synchronization \(MX Series\)](#).

## Configuring Hybrid Mode with a User-Defined Mapping of the PTP Clock Class to the ESMC Quality Level

To configure hybrid mode options with a user-defined mapping of the PTP clock class to the ESMC quality level, perform the following steps:

1. In configuration mode, go to the **[edit protocols ptp slave]** hierarchy level:

```
[edit]
user@host# edit protocols ptp slave
```

2. To override the default mapping option, perform the following steps:

- a. Configure the **clock-class-to-quality-level-mapping** option with one of the quality level values. The quality level values are prc, prs, sec, smc, ssu-a, ssu-b, st2, st3, st3e, st4, stu, and tnc.

```
[edit protocols ptp slave]
user@host# edit clock-class-to-quality-level-mapping quality-level prc | prs | sec
| smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc
```

- b. Configure the **clock-class** option for the set quality level. The clock class value ranges from 80 through 109.

```
[edit protocols ptp slave clock-class-to-quality-level-mapping quality-level
quality-level-value]
user@host# set clock-class clock-class
```



**NOTE:** In hybrid mode, the boundary node advertises the grandmaster clock class value only after phase lock is achieved.

3. Configure the hybrid mode option on the slave.

```
[edit protocols ptp slave]
user@host# edit hybrid
```

4. Configure the Synchronous Ethernet mapping option in hybrid mode.

```
[edit protocols ptp slave hybrid]
user@host# edit synchronous-ethernet-mapping
```

5. Configure the IP address of the clock source.

```
[edit protocols ptp slave hybrid synchronous-ethernet-mapping]
user@host# edit clock-source ip-address
```

6. Configure one or more Synchronous Ethernet source interfaces for the slave as needed.

```
[edit protocols ptp slave hybrid synchronous-ethernet-mapping clock-source ip-address]
user@host# set interface interface1-name
user@host# set interface interface2-name
```



**NOTE:** You must first configure these interfaces at the [edit chassis synchronization] hierarchy level as Synchronous Ethernet sources. For information about configuring these interfaces, see [synchronization \(MX Series\)](#).

For information about verifying the aforementioned procedure, see “[Example: Configuring Hybrid Mode and ESMC Quality Level Mapping](#)” on page 333.

#### Related Documentation

- [Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 333](#)
- [Understanding Hybrid Mode on page 288](#)
- [Precision Time Protocol Overview on page 256](#)
- [Synchronous Ethernet Overview on page 242](#)

## Example: Configuring Hybrid Mode and ESMC Quality Level Mapping

This example shows the configuration of hybrid mode by mapping the PTP clock class to the ESMC quality level and also by configuring a user-defined mapping of the PTP clock class to the ESMC quality level on MX240 Universal Routing Platforms.

- [Requirements for Hybrid Mode Configuration on page 333](#)
- [Overview on page 333](#)
- [Configuration on page 335](#)
- [Verification on page 337](#)

### Requirements for Hybrid Mode Configuration

This example uses the following hardware and software components:

- One MX240 router.
- Junos OS Release 12.2R2 or later.

### Overview

The combined operation of Synchronous Ethernet and Precision Time Protocol (PTP) is also known as hybrid mode. In hybrid mode, the synchronous Ethernet equipment clock (EEC) on the Modular Port Concentrator (MPC) derives the frequency from Synchronous Ethernet and the phase and time of day from PTP.

You can configure hybrid mode on MX240, MX480, and MX960 Universal Routing Platforms and on MX80 Universal Routing Platforms with precision timing support (MX80-P) and with timing support (MX80-T). On the MX240, MX480, and MX960 routers, the combined operation is possible only when the PTP slave and the Synchronous Ethernet source are on the same enhanced MPC and are traceable to the same master. When acting as a PTP slave, an MX80-P or MX80-T router can accept any external Synchronous Ethernet clock as reference. Note that when the selected Synchronous Ethernet reference fails, the router continues to work in PTP mode.

Hybrid mode is configured on the slave. On the slave, one or more interfaces are configured as Synchronous Ethernet source interfaces.



**NOTE:** You can set the values for each parameter according to your requirement. The values given in this example are for illustration purposes only.

The ESMC quality level value is mapped to the clock class value either by mapping the PTP clock class to the ESMC quality level or by configuring a user-defined mapping of the PTP clock class to the ESMC quality level. For more information, see [“Understanding ESMC Quality Level Mapping” on page 280](#). The following examples explain configuring hybrid mode with either of the modes in detail.

To configure the router in hybrid mode, you must:

1. Configure Synchronous Ethernet options at the **[edit chassis synchronization]** hierarchy level:
  - Configure the **auto-select** mode of operation. You can select the clock source either from a free-run local oscillator or from an external qualified clock.  
  
When the router is configured with the **auto-select** option, the router chooses up to two best upstream clock sources. It then uses the clock recovered from one of the sources to lock the chassis clock. If an upstream clock with acceptable quality is not available or if the router is configured in free-run mode, the router uses the internal oscillator.
  - Configure the **esmc-transmit** and **network-option** options at the **[edit chassis synchronization]** hierarchy level.
  - Configure one or more interfaces at the **[edit chassis synchronization]** hierarchy level as Synchronous Ethernet sources as needed.
2. Configure PTP options at the **[edit protocols ptp]** hierarchy level.
3. Configure hybrid mode options at the **[edit protocols ptp slave]** hierarchy level.

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode*. For step-by-step configuration of hybrid mode, see [“Configuring Hybrid Mode and ESMC Quality Level Mapping” on page 329](#).



## Configuration

- [Hybrid Mode with Mapping of the PTP Clock Class to the ESMC Quality Level on page 335](#)
- [Hybrid Mode with a User-Defined Mapping of the PTP Clock Class to the ESMC Quality Level on page 336](#)

### Hybrid Mode with Mapping of the PTP Clock Class to the ESMC Quality Level

#### CLI Quick Configuration

To quickly configure hybrid mode on the ge-1/2/3.0 interface with the clock source IP address as 2.2.2.2, copy the following commands, paste them in a text file, remove any line breaks, and then copy and paste the commands into the CLI.

[edit]

```
set protocols ptp slave hybrid
set protocols ptp slave hybrid synchronous-ethernet-mapping
set protocols ptp slave hybrid synchronous-ethernet-mapping clock-source 2.2.2.2 interface
ge-1/2/3.0
set protocols ptp slave convert-clock-class-to-quality-level
```

#### Step-by-Step Procedure

To configure hybrid mode on an MX240 router with mapping of the PTP clock class to the ESMC quality level, perform the following steps:

1. Configure the **convert-clock-class-to-quality-level** option on the slave at the **[edit protocols ptp slave]** hierarchy level.

```
[edit protocols ptp slave]
user@host# set convert-clock-class-to-quality-level
```

2. Configure hybrid mode on the slave.

```
[edit protocols ptp slave]
user@host# edit hybrid
```

3. Configure the Synchronous Ethernet mapping option, IP address of the master clock as 2.2.2.2, and the interface ge-1/2/3.0 for hybrid mode on the slave.

```
[edit protocols ptp slave hybrid]
user@host# set synchronous-ethernet-mapping clock-source 2.2.2.2 interface
ge-1/2/3.0
```

#### Results

Display the results of the configuration of hybrid mode with the mapping of the PTP clock class to the ESMC quality level:

```
[edit protocols ptp slave]
user@host# show
```

```

convert-clock-class-to-quality-level
hybrid {
  synchronous-ethernet-mapping {
    clock-source 2.2.2.2 {
      interface ge-1/2/3.0;
    }
  }
}

```

### Hybrid Mode with a User-Defined Mapping of the PTP Clock Class to the ESMC Quality Level

#### CLI Quick Configuration

To quickly configure hybrid mode on the interface ge-1/2/3.0, copy the following commands, paste them in a text file, remove any line breaks, and then copy and paste the commands into the CLI.

[edit]

```

set protocols ptp slave hybrid
set protocols ptp slave hybrid synchronous-ethernet-mapping
set protocols ptp slave hybrid synchronous-ethernet-mapping clock-source 2.2.2.2 interface
ge-1/2/3.0
set protocols ptp slave clock-class-to-quality-level-mapping quality-level prc clock-class
80

```

#### Step-by-Step Procedure

To configure hybrid mode with a user-defined mapping of the PTP clock class to the ESMC quality level on an MX240 router, perform the following steps:

1. Configure the **quality-level** option for the **clock-class-to-quality-level-mapping** statement on the slave at the **[edit protocols ptp slave]** hierarchy level and then configure the **clock-class** option for the set quality level if you want to manually override the mapping of the ESMC quality level to the clock class.

```

[edit protocols ptp slave]
user@host# set clock-class-to-quality-level-mapping quality-level prc clock-class
80

```

2. Configure hybrid mode on the slave.

```

[edit protocols ptp slave]
user@host# edit hybrid

```

3. Configure the Synchronous Ethernet mapping option, IP address of the master clock as 2.2.2.2, and the interface ge-1/2/3.0 for hybrid mode on the slave.

```

[edit protocols ptp slave hybrid]
user@host# set synchronous-ethernet-mapping clock-source 2.2.2.2 interface
ge-1/2/3.0

```

**Results** Display the results of the configuration of hybrid mode with a user-defined mapping of the PTP clock class to the ESMC quality level:

```
[edit protocols ptp slave]
user@host# show
clock-class-to-quality-level-mapping {
  quality-level prc {
    clock-class 80;
  }
}
hybrid {
  synchronous-ethernet-mapping {
    clock-source 2.2.2.2 {
      interface ge-1/2/3.0;
    }
  }
}
```

## Verification

- [Verifying That the Router Is Operating in Hybrid Mode on page 337](#)
- [Verifying the Quality Level Change on the Transmit Side on page 337](#)
- [Verifying Global Information Parameters After Mapping of the PTP Clock Class to the ESMC Quality Level in Hybrid Mode on page 338](#)
- [Verifying Global Information Parameters After Configuring User-Defined Mapping of the PTP Clock Class to the ESMC Quality Level in Hybrid Mode on page 339](#)

### Verifying That the Router Is Operating in Hybrid Mode

**Purpose** Verify the current mode of operation of the slave.

**Action** In operational mode, enter the **run show ptp hybrid** command to display the current configuration and current mode of operation of the slave.

In operational mode, enter the **run show ptp hybrid config** command to display the PTP source to Synchronous Ethernet interface mappings.

In operational mode, enter the **run show ptp hybrid status** command to display the current hybrid mode operational status.

**Meaning** The output displays the current configuration and current mode of operation of the slave. For information about the **run show ptp hybrid** operational command, see [show ptp hybrid](#).

### Verifying the Quality Level Change on the Transmit Side

**Purpose** Verify the quality level change on the transmit side of the router.

**Action** In operational mode, enter the **run show synchronous-ethernet esmc transmit detail** command to display the ESMC transmit interface details.

**Meaning** The output displays the ESMC SSM quality level transmitted out of various Ethernet interfaces. For information about the **run show synchronous-ethernet esmc transmit detail** operational command, see [show synchronous-ethernet esmc transmit](#).

### Verifying Global Information Parameters After Mapping of the PTP Clock Class to the ESMC Quality Level in Hybrid Mode

**Purpose** Verify the global information parameters after mapping of the PTP clock class to the ESMC quality level in hybrid mode by enabling the **convert-clock-class-to-quality-level** option.

**Action** In operational mode, enter the **run show ptp global-information** command to display the following output:

```
user@host> run show ptp global-information
PTP Global Configuration:
Domain number          : 0
Transport Encapsulation : IPv4
Clock mode             : Ordinary
Priority Level1         : 128
Priority Level2         : 128
Unicast Negotiation    : Disabled
ESMC QL From Clock Class: Enabled
Clock Class/ESMC QL    : 84 / (QL SSU-A/SSM 0x4)
Slave Parameters:
  Sync Interval         : -
  Delay Request Interval: -6 (64 packets per second)
  Announce Interval     : -
  Announce Timeout      : 3
Master Parameters:
  Sync Interval         : -6 (64 packets per second)
  Delay Request Interval: -
  Announce Interval     : 1 (1 packet every 2 seconds)
  Clock Step            : one-step
Number of Slaves        : 1
Number of Masters       : 0
```

In operational mode, enter the **run show ptp quality-level-mapping** command to display the following output:

```
user@host> run show ptp quality-level-mapping

quality level      ptp clock class
PRC                84
SSU-A              92
SSU-B              96
SEC                104
```

**Meaning** The output for `run show ptp global-information` displays the parameters set in Synchronous Ethernet mode and the parameters set for the master and the slave.

The output of `run show ptp quality-level-mapping` displays the default mapping of the clock class to the ESMC quality level.

### Verifying Global Information Parameters After Configuring User-Defined Mapping of the PTP Clock Class to the ESMC Quality Level in Hybrid Mode

**Purpose** Verify the global information parameters after configuring a user-defined mapping of the PTP clock class to the ESMC quality level in hybrid mode by disabling the `convert-clock-class-to-quality-level` option.

**Action** In operational mode, enter the `run show ptp global-information` command to display the following output:

```
user@host> run show ptp global-information
PTP Global Configuration:
Domain number          : 0
Transport Encapsulation : IPv4
Clock mode              : Ordinary
Priority Level1         : 128
Priority Level2         : 128
Unicast Negotiation     : Disabled
ESMC QL From Clock Class: Disabled
Clock Class/ESMC QL     : -
Slave Parameters:
  Sync Interval         : -
  Delay Request Interval: -6 (64 packets per second)
  Announce Interval     : -
  Announce Timeout      : 3
Master Parameters:
  Sync Interval         : -6 (64 packets per second)
  Delay Request Interval: -
  Announce Interval     : 1 (1 packet every 2 seconds)
  Clock Step            : one-step
```

**Meaning** The output displays the parameters set in Synchronous Ethernet mode and the parameters set for the master and the slave.

**Related Documentation**

- [Configuring Hybrid Mode and ESMC Quality Level Mapping on page 329](#)
- [Understanding Hybrid Mode on page 288](#)
- [Precision Time Protocol Overview on page 256](#)
- [Synchronous Ethernet Overview on page 242](#)

## Example: Configuring Centralized Clocking on the Enhanced MX Switch Control Board

These examples show how to configure the following clock sources and features on an Enhanced MX Switch Control Board (SCBE): Synchronous Ethernet, ordinary Precision Time Protocol (PTP) slave, hybrid PTP slave, and retiming through the building-integrated timing supply (BITS) external interface.

- [Requirements on page 340](#)
- [Overview on page 340](#)
- [Configuration on page 341](#)
- [Verification on page 346](#)

### Requirements

These examples use the following hardware and software components:

- One MX240, MX480, or MX960 router with MPC 16x10GE or MPC2Es (see *MPCs Supported by MX Series Routers*) for Synchronous Ethernet clock sources, or MPC2E-P for PTP clock sources
- One Synchronous Ethernet clock source device (may be an MX240, MX480, or MX960 router)
- One PTP grandmaster device
- One BITS device (may be the same as the PTP grandmaster device)
- Junos OS Release 12.2 or later for MX240, MX480, or MX960 routers
- Junos OS Release 12.3 or later to configure a BITS interface as an input, output, or I/O clock source for MX240, MX480, or MX960 routers

Before you begin configuring centralized clocking on an interface that uses Synchronous Ethernet, ensure that you have configured the MX Series interface as a chassis synchronization source to the device that provides a Synchronous Ethernet clock source.

- Configure the MX Series interface as a chassis synchronization source to the device that provides a Synchronous Ethernet clock source.

### Overview

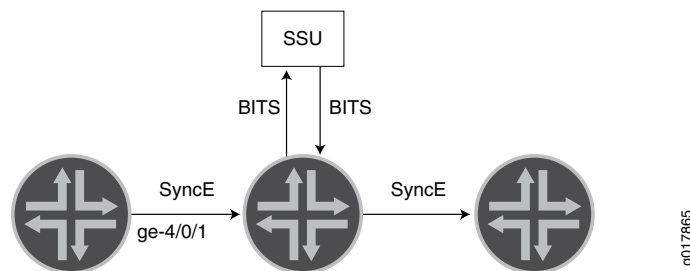
With the addition of a Stratum 3 clock module to the SCBE, an MX240, MX480, or MX960 chassis can perform clock monitoring, filtering, and holdover in a centralized chassis location. Chassis line cards can be configured to recover network timing clocks at the physical layer via Synchronous Ethernet or by a packet-based PTP implementation. These recovered clocks are routed to the SCBE Stratum 3 clock module via the chassis backplane. A clock selection algorithm is run that selects the best quality recovered clock from the list of configured clock sources. The Stratum 3 clock module locks to the selected clock source and fans it out to the chassis line cards. 16x10GE 3D and MPC2Es (see *MPCs Supported by MX Series Routers*) can distribute this clock to downstream network elements via Synchronous Ethernet.

The Stratum 3 clock module acquires holdover data while locked to the selected clock source. If the clock fails, the Stratum 3 clock module enters holdover mode and replays collected holdover data to maintain its output clock. The Stratum 3 holdover performance depends on the drift of the SCBE OXCO device.

In Junos 12.3, support was added for synchronizing an MX240, MX480, or MX960 chassis with an SCBE to a BITS timing source through an RJ-48 port on the SCBE. The BITS external clock interface supports the sending and receiving of Synchronization Status Message (SSM) quality levels. The quality level is used by the chassis clock-selection algorithm. When BITS output is configured, the source-mode default is the selected line clock source.

The BITS external interface can be connected to a retiming device, which cleans up the clock and sends it back in the external BITS interface. The conditioned input BITS clock is selected as the chassis clock and distributed downstream via Synchronous Ethernet interfaces. The `tx-dnu-to-line-source-enable` option is used to prevent a timing loop. [Figure 8 on page 341](#) shows the BITS retiming functionality using a Synchronization Supply Unit (SSU). For instructions on how to configure retiming through the BITS external interface, see [“Configuring Retiming through the BITS External Interface” on page 344](#).

**Figure 8: BITS Retiming with Synchronization Supply Unit (SSU)**



Prior to the SCBE, clock monitoring, filtering, and holdover functions were distributed throughout the chassis and performed on MPC2E line cards. This distributed clocking mode limits the distribution of timing to downstream network elements on MPC2E interfaces only. Centralized clocking mode removes this limitation by supporting the distribution of timing on MPC 16x 10GE line interfaces as well.

## Configuration

To configure centralized clocking, perform one or more of these tasks:

- [Configuring Centralized Clocking from a Synchronous Ethernet Clock Source on page 341](#)
- [Configuring Centralized Clocking from an Ordinary PTP Clock Source on page 343](#)
- [Configuring Centralized Clocking from a Hybrid PTP Clock Source on page 343](#)
- [Configuring Retiming through the BITS External Interface on page 344](#)

### Configuring Centralized Clocking from a Synchronous Ethernet Clock Source

#### CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network

configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

```
set chassis synchronization network-option option-2
set chassis synchronization source interfaces ge-4/1/0 priority 1
set chassis synchronization source interfaces ge-4/1/0 quality-level st3
```

### Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a Synchronous Ethernet clock source:

1. Configure the network option:

```
[edit chassis synchronization]
user@host# set network-option option-2
```

2. Configure the priority and quality level of the clock source on this interface:

```
[edit chassis synchronization source interfaces ge-4/1/0]
user@host# set priority 1
user@host# set quality-level st3
```

### Results

From configuration mode, confirm your configuration by entering the **show chassis synchronization** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show chassis synchronization
network-option option-2;
source {
    interfaces ge-4/1/0 {
        priority 1;
        quality-level st3;
    }
}
```

After you configure the device, enter **commit** from configuration mode.



### Configuring Centralized Clocking from an Ordinary PTP Clock Source

#### Step-by-Step Procedure

To configure a PTP clock source:

1. Configure ordinary mode PTP on the ge-4/1/9 interface to the PTP grandmaster device. See “[Example: Configuring Precision Time Protocol](#)” on page 325.

### Configuring Centralized Clocking from a Hybrid PTP Clock Source

#### CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

```
set chassis synchronization network-option option-2
set chassis synchronization source interfaces ge-4/1/0 priority 1
set chassis synchronization source interfaces ge-4/1/0 quality-level st3
```

#### Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a hybrid PTP clock source:

1. Configure the network option:

```
[edit chassis synchronization]
user@host# set network-option option-2
```

2. Configure the priority and quality level of the clock source on this interface:

```
[edit chassis synchronization source interfaces ge-4/1/0]
user@host# set priority 1
user@host# set quality-level st3
```

3. Configure hybrid mode PTP on the ge-4/1/9 interface to the PTP grandmaster device. For the **synchronous-ethernet-mapping** interface, specify the Synchronous Ethernet interface used in Step 2.

#### Results

From configuration mode, confirm your configuration by entering the **show chassis synchronization** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show chassis synchronization
```

```

network-option option-2;
source {
    interfaces ge-4/1/0 {
        priority 1;
        quality-level st3;
    }
}

```

After you configure the device, enter **commit** from configuration mode.

### Configuring Retiming through the BITS External Interface

#### CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

```

set chassis synchronization network-option option-2
set chassis synchronization interfaces external signal-type t1
set chassis synchronization interfaces external t1-options line-encoding b8zs
set chassis synchronization interfaces external t1-options framing sf
set chassis synchronization output interfaces external wander-filter-disable
set chassis synchronization output interfaces external holdover-mode-disable
set chassis synchronization output interfaces external source-mode line
set chassis synchronization output interfaces external tx-dnu-to-line-source-enable
set chassis synchronization output interfaces external minimum-quality st3
set chassis synchronization source interfaces ge-4/0/1 quality-level st3
set chassis synchronization source interfaces external quality-level prs

```

#### Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure retiming through the BITS external interface using an SSU:

1. Configure the network option (G.812 type IV clock):

```

[edit chassis synchronization]
user@host# set network-option option-2

```

2. Configure the external BITS signal type (T1-coded 1.544-MHz signal on 100-ohm balanced line):

```

[edit chassis synchronization interfaces external]
set signal-type t1

```

3. Configure the external BITS signal line-encoding (B8ZS) and framing (superframe) options:

```
[edit chassis synchronization interfaces external]
user@host# set t1-options line-encoding b8zs
user@host# set t1-options framing sf
```

4. Configure the output external BITS signal properties:

- Disable wander filtering:

```
[edit chassis synchronization output interfaces external]
user@host# set wander-filter-disable
```

- Disable holdover:

```
[edit chassis synchronization output interfaces external]
user@host# set holdover-mode-disable
```

- Select the best line clock source for output:

```
[edit chassis synchronization output interfaces external]
user@host# set source-mode line
```

- Set Tx QL to DNU/DUS on the line source interface to prevent a timing loop:

```
[edit chassis synchronization output interfaces external]
user@host# set tx-dnu-to-line-source-enable
```

- Set minimum quality level:

```
[edit chassis synchronization output interfaces external]
user@host# set minimum-quality st3
```

5. Configure the incoming clock source and quality level:

```
[edit chassis synchronization source interfaces ge-4/0/1]
user@host# set quality-level st3
```

6. Configure the external clock source and quality level:

```
[edit chassis synchronization source interfaces external]
user@host# set quality-level prs
```

**Results** From configuration mode, confirm your configuration by entering the **show chassis synchronization** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show chassis synchronization
network-option option-2;
interfaces external {
  signal-type t1;
```

```

    t1-options {
        line-encoding b8zs;
        framing sf;
    }
}
output {
    interfaces external {
        wander-filter-disable;
        holdover-mode-disable;
        source-mode line;
        tx-dnu-to-line-source-enable;
        minimum-quality st3;
    }
}
source {
    interfaces ge-4/0/1 {
        quality-level st3;
    }
    interfaces external {
        quality-level prs;
    }
}

```

After you configure the device, enter **commit** from configuration mode.

## Verification

Confirm that the configuration is working properly.

- [Verifying the Synchronous Ethernet Clock Source on page 346](#)
- [Verifying the Ordinary PTP Clock Source on page 347](#)
- [Verifying the Hybrid PTP Clock Source on page 347](#)
- [Verifying the Retiming through the BITS External Interface on page 348](#)

### Verifying the Synchronous Ethernet Clock Source

**Purpose** Verify that the MX Series router recovers, selects, qualifies, and locks to the configured Synchronous Ethernet clock source.

**Action** From operational mode, enter the **show chassis synchronization clock-module** command.

```

user@host> show chassis synchronization clock-module

Clock module on SCB0
Current role      : master
Current state     : locked to ge-4/1/0
State for        : 0 days, 00 hrs, 00 mins, 15 secs
State since      : Mon Jun  6 07:28:47 2011
Monitored clock sources
Interface        Type      Status
ge-4/1/0         syncE    qualified-selected

```

**Meaning** The Monitored clock sources field shows that the ge-4/1/0 interface has the Synchronous Ethernet type and is the qualified and selected centralized clock source.

### Verifying the Ordinary PTP Clock Source

**Purpose** Verify that the MX Series router recovers, selects, qualifies, and locks to the configured PTP clock source.

**Action** From operational mode, enter the **show chassis synchronization clock-module** command.

```
user@host> show chassis synchronization clock-module

Clock module on SCB0
  Current role      : master
  Current state     : locked to ge-4/1/9
    State for       : 0 days, 00 hrs, 00 mins, 45 secs
    State since     : Wed Jun 29 10:52:05 2011
  Monitored clock sources
    Interface      Type      Status
    ge-4/1/9       ptp       qualified-selected
```

**Meaning** The Monitored clock sources field shows that the ge-4/1/9 interface has the ptp type and is the qualified and selected centralized clock source.

### Verifying the Hybrid PTP Clock Source

**Purpose** Verify that the MX Series router recovers, selects, qualifies, and locks to the configured hybrid PTP clock source.

**Action** From operational mode, enter the **show chassis synchronization clock-module** command.

```
user@host> show chassis synchronization clock-module

Clock module on SCB0
  Current role      : master
  Current state     : locked to ge-4/1/9
    State for       : 0 days, 00 hrs, 00 mins, 15 secs
    State since     : Wed Jun 29 11:19:25 2011
  Monitored clock sources
    Interface      Type      Status
    ge-4/1/9       ptp-hybrid qualified-selected

Configured sources:

Interface      : ge-4/1/0
Status         : Primary      Index      : 218
Clock source state : Clk qualified Priority : 1
Configured QL    : ST3        ESMC QL    : DUS
Clock source type : ifd          Clock Event : Clock locked
Kernel flags     : Up,sec,
```

**Meaning** The Monitored clock sources field shows that the ge-4/1/9 interface has the ptp-hybrid type and is the qualified and selected centralized clock source. The Configured sources field shows that the ge-4/1/0 interface has the Clock locked Clock Event .

### Verifying the Retiming through the BITS External Interface

**Purpose** Verify that the MX Series router recovers, selects, qualifies, and locks to the configured clock source, and that the external clock is locked to the configured clock source.

**Action** From operational mode, enter the **show chassis synchronization extensive** command.

```
user@host> show chassis synchronization extensive

Current clock status : Locked
Clock locked to      : Primary

Configured interfaces:

Name      : external
Signal type : t1 (sf b8zs)
Rx status  : active
Tx status  : active
LED color  : green

Configured outputs:

Interface      : external
Tx status      : active
Minimum QL     : ST3           Tx QL           : ST3
Holdover mode  : disabled      Wander filter : disabled
Source mode    : line          Source Tx DNU : enabled
Holdover data  : valid
Current state  : locked to ge-4/0/1
State for      : 0 days, 00 hrs, 24 mins, 47 secs
State since    : Thu Sep  6 13:01:07 2012

Configured sources:

Interface      : external
Status         : Primary      Index        : 0
Clock source state : Clk qualified Priority      : Default(6)
Configured QL    : PRS        ESMC QL         : PRS
Clock source type : extern     Clock Event    : Clock locked
Interface State  : Up,pri,

Interface      : ge-4/0/1
Status         : Secondary    Index        : 152
Clock source state : Clk qualified Priority      : Default(8)
Configured QL    : ST3        ESMC QL         : DUS
Clock source type : ifd        Clock Event    : Clock qualified
Interface State  : Up,sec,ESMC TX(QL DUS/SSM 0xf),
```

**Meaning** The Configured interfaces field shows that the external interface receive and transmit statuses are active. The Configured outputs field shows that the current state is locked to ge-4/0/1. The Configured sources field shows that the external interface is the qualified and selected centralized clock source, and has the Clock locked Clock Event. The Configured sources field shows that the ge-4/0/1 interface is the secondary clock source, and has the Clock qualified Clock Event.

- Related Documentation**
- [synchronization on page 794](#)
  - [show chassis synchronization \(MX Series Routers\) on page 2161](#)
  - [Example: Configuring Precision Time Protocol on page 325](#)
  - [Configuring Hybrid Mode and ESMC Quality Level Mapping on page 329](#)
  - [Precision Time Protocol Overview on page 256](#)

---

## Example: Configuring Centralized Clocking on an MX2020

These examples show how to configure the following clock sources and features on an MX2020 router: Synchronous Ethernet, Precision Time Protocol (PTP) slave, hybrid PTP slave, and retiming through the building-integrated timing supply (BITS) external interface.

- [Requirements on page 349](#)
- [Overview on page 350](#)
- [Configuration on page 350](#)
- [Verification on page 356](#)

### Requirements

These examples use the following hardware and software components:

- One MX2020, with MPC 16x10GE or MPC2Es (see *MPCs Supported by MX Series Routers*) for Synchronous Ethernet clock sources, or MPC2E-P for PTP clock sources
- One Synchronous Ethernet clock source device
- One PTP grandmaster device
- One BITS device (may be the same as the PTP grandmaster device)
- Junos OS Release 13.3 for MX2020 routers
- Junos OS Release 13.3 or later to configure a BITS interface as an input, output, or I/O clock source for MX2020 router

- Configure the MX Series interface as a chassis synchronization source to the device that provides a Synchronous Ethernet clock source.

## Overview

With the addition of a Stratum 3 (ST3) clock module the MX2020 chassis can perform clock monitoring, filtering, and holdover in a centralized chassis location. Chassis line cards can be configured to recover network timing clocks at the physical layer via Synchronous Ethernet or by a packet-based PTP implementation. These recovered clocks are routed to MX2020 SCB ST3 clock module via the chassis backplane. A clock selection algorithm is run that selects the best quality recovered clock from the list of configured clock sources. The ST3 clock module locks to the selected clock source and fans it out to the chassis line cards. 16x10GE 3D and MPC2Es (see *MPCs Supported by MX Series Routers*) can distribute this clock to downstream network elements via Synchronous Ethernet.

The ST3 clock module acquires holdover data while locked to the selected clock source. If the clock fails, the ST3 clock module enters holdover mode and replays collected holdover data to maintain its output clock. The ST3 holdover performance depends on the drift of the MX SCB OCXO device.

In Junos 13.3, support was added for synchronizing an MX2020 chassis to a BITS timing source using any of the two BITS interfaces. The quality level is used by the chassis clock-selection algorithm. When BITS output is configured, the source-mode can be configured as either **chassis** or **line**.

The BITS external interface can be connected to a retiming device, which cleans up the clock and sends it back in the external BITS interface. The conditioned input BITS clock is selected as the chassis clock and distributed downstream via Synchronous Ethernet interfaces. The **tx-dnu-to-line-source-enable** option is used to prevent a timing loop. For instructions on how to configure retiming through the BITS external interface, see [“Configuring Retiming through the BITS External Interface” on page 344](#).

Prior to 13.3, clock monitoring, filtering, and holdover functions were distributed throughout the chassis and performed on MPC2E line cards. This distributed clocking mode limits the distribution of timing to downstream network elements on MPC2E interfaces only. Centralized clocking mode removes this limitation by supporting the distribution of timing on MPC 16x 10GE line interfaces as well.

## Configuration

To configure centralized clocking, perform one or more of these tasks:

- [Configuring Centralized Clocking from a Synchronous Ethernet Clock Source on page 351](#)
- [Configuring an ordinary PTP Clock Source on page 352](#)
- [Configuring Centralized Clocking from a Hybrid Mode PTP Clock Source on page 352](#)
- [Configuring Hybrid Mode PTP on page 353](#)
- [Configuring Retiming through the BITS External Interface on page 354](#)



### Configuring Centralized Clocking from a Synchronous Ethernet Clock Source

**CLI Quick Configuration** To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

```
set chassis synchronization network-option option-2
set chassis synchronization source interfaces ge-4/1/0 priority 1
set chassis synchronization source interfaces ge-4/1/0 quality-level st3
```

**Step-by-Step Procedure** The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a Synchronous Ethernet clock source:

1. Configure the network option:

```
[edit chassis synchronization]
user@host# set network-option option-2
```

2. Configure the priority and quality level of the clock source on this interface:

```
[edit chassis synchronization source interfaces ge-4/1/0]
user@host# set priority 1
user@host# set quality-level st3
```

**Results** From configuration mode, confirm your configuration by entering the **show chassis synchronization** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show chassis synchronization
network-option option-2;
source {
    interfaces ge-4/1/0 {
        priority 1;
        quality-level st3;
    }
}
```

After you configure the device, enter **commit** from configuration mode.

### Configuring an ordinary PTP Clock Source

---

#### Step-by-Step Procedure

To configure a PTP clock source:

1. Configure ordinary mode PTP on the ge-4/1/9 interface to the PTP grandmaster device. See [“Example: Configuring Precision Time Protocol” on page 325](#).

### Configuring Centralized Clocking from a Hybrid Mode PTP Clock Source

---

#### CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

```
set chassis synchronization network-option option-2
set chassis synchronization source interfaces ge-4/1/0 priority 1
set chassis synchronization source interfaces ge-4/1/0 quality-level st3
```

#### Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a hybrid mode PTP clock source:

1. Configure the network option:

```
[edit chassis synchronization]
user@host# set network-option option-2
```

2. Configure the priority and quality level of the clock source on this interface:

```
[edit chassis synchronization source interfaces ge-4/1/0]
user@host# set priority 1
user@host# set quality-level st3
```

3. To configure hybrid mode PTP on the ge-4/1/9 interface to the PTP grandmaster device, see [“Configuring Hybrid Mode PTP” on page 353](#).

#### Results

From configuration mode, confirm your configuration by entering the **show chassis synchronization** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show chassis synchronization
network-option option-2;
source {
```

```

interfaces ge-4/1/0 {
    priority 1;
    quality-level st3;
}

```

After you configure the device, enter **commit** from configuration mode.

### Configuring Hybrid Mode PTP

#### CLI Quick Configuration

To quickly configure hybrid mode on the ge-4/1/0 interface with the clock source IP address as 2.2.2.2, copy the following commands, paste them in a text file, remove any line breaks, and then copy and paste the commands into the CLI.

[edit]

```

set protocols ptp slave hybrid
set protocols ptp slave hybrid synchronous-ethernet-mapping
set protocols ptp slave hybrid synchronous-ethernet-mapping clock-source 2.2.2.2 interface
ge-4/1/0
set protocols ptp slave convert-clock-class-to-quality-level

```

#### Step-by-Step Procedure

To configure hybrid mode on an MX240 router with mapping of the PTP clock class perform the following steps:

1. Configure the **convert-clock-class-to-quality-level** option on the slave at the **[edit protocols ptp slave]** hierarchy level.

```

[edit protocols ptp slave]
user@host# set convert-clock-class-to-quality-level

```

2. Configure hybrid mode on the slave.

```

[edit protocols ptp slave]
user@host# edit hybrid

```

3. Configure the Synchronous Ethernet mapping option, IP address of the master clock as 2.2.2.2, and the interface ge-4/1/0 for hybrid mode on the slave.

```

[edit protocols ptp slave hybrid]
user@host# set synchronous-ethernet-mapping clock-source 2.2.2.2 interface
ge-4/1/0

```

#### Results

Display the results of the configuration of hybrid mode with the mapping of the PTP clock class to the ESMC quality level:

```
[edit protocols ptp slave]
user@host# show
convert-clock-class-to-quality-level
hybrid {
  synchronous-ethernet-mapping {
    clock-source 2.2.2.2 {
      interface ge-4/1/0;
    }
  }
}
```

### Configuring Retiming through the BITS External Interface

#### CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

```
set chassis synchronization network-option option-2
set chassis synchronization interfaces external signal-type t1
set chassis synchronization interfaces external t1-options line-encoding b8zs
set chassis synchronization interfaces external t1-options framing sf
set chassis synchronization output interfaces external wander-filter-disable
set chassis synchronization output interfaces external holdover-mode-disable
set chassis synchronization output interfaces external source-mode line
set chassis synchronization output interfaces external tx-dnu-to-line-source-enable
set chassis synchronization output interfaces external minimum-quality st3
set chassis synchronization source interfaces ge-4/0/1 quality-level st3
set chassis synchronization source interfaces external quality-level prs
```

#### Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure retiming through the BITS external interface using an SSU:

1. Configure the network option (G.812 type IV clock):

```
[edit chassis synchronization]
user@host# set network-option option-2
```

2. Configure the external BITS signal type (T1-coded 1.544-MHz signal on 100-ohm balanced line):

```
[edit chassis synchronization interfaces external]
set signal-type t1
```

3. Configure the external BITS signal line-encoding (B8ZS) and framing (superframe) options:

```
[edit chassis synchronization interfaces external]
user@host# set t1-options line-encoding b8zs
user@host# set t1-options framing sf
```

4. Configure the output external BITS signal properties:

- Disable wander filtering:

```
[edit chassis synchronization output interfaces external]
user@host# set wander-filter-disable
```

- Disable holdover:

```
[edit chassis synchronization output interfaces external]
user@host# set holdover-mode-disable
```

- Select the best line clock source for output:

```
[edit chassis synchronization output interfaces external]
user@host# set source-mode line
```

- Set Tx QL to DNU/DUS on the line source interface to prevent a timing loop:

```
[edit chassis synchronization output interfaces external]
user@host# set tx-dnu-to-line-source-enable
```

- Set minimum quality level:

```
[edit chassis synchronization output interfaces external]
user@host# set minimum-quality st3
```

5. Configure the incoming clock source and quality level:

```
[edit chassis synchronization source interfaces ge-4/0/1]
user@host# set quality-level st3
```

6. Configure the external clock source and quality level:

```
[edit chassis synchronization source interfaces external]
user@host# set quality-level prs
```

**Results** From configuration mode, confirm your configuration by entering the **show chassis synchronization** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show chassis synchronization
network-option option-2;
interfaces external {
  signal-type t1;
```

```

    t1-options {
        line-encoding b8zs;
        framing sf;
    }
}
output {
    interfaces external {
        wander-filter-disable;
        holdover-mode-disable;
        source-mode line;
        tx-dnu-to-line-source-enable;
        minimum-quality st3;
    }
}
source {
    interfaces ge-4/0/1 {
        quality-level st3;
    }
    interfaces external {
        quality-level prs;
    }
}

```

After you configure the device, enter **commit** from configuration mode.

## Verification

Confirm that the configuration is working properly.

- [Verifying the Synchronous Ethernet Clock Source on page 356](#)
- [Verifying the Ordinary PTP Clock Source on page 357](#)
- [Verifying the Hybrid PTP Clock Source on page 357](#)
- [Verifying the Retiming through the BITS External Interface on page 358](#)

### Verifying the Synchronous Ethernet Clock Source

**Purpose** Verify that the MX Series router recovers, selects, qualifies, and locks to the configured Synchronous Ethernet clock source.

**Action** From operational mode, enter the **show chassis synchronization clock-module** command.

```

user@host> show chassis synchronization clock-module

Clock module on SCB0
Current role      : master
Current state     : locked to ge-4/1/0
State for        : 0 days, 00 hrs, 00 mins, 15 secs
State since      : Mon Jun  6 07:28:47 2011
Monitored clock sources
Interface        Type      Status
ge-4/1/0         syncE    qualified-selected

```

**Meaning** The Monitored clock sources field shows that the ge-4/1/0 interface has the Synchronous Ethernet type and is the qualified and selected centralized clock source.

### Verifying the Ordinary PTP Clock Source

**Purpose** Verify that the MX Series router recovers, selects, qualifies, and locks to the configured PTP clock source.

**Action** From operational mode, enter the **show chassis synchronization clock-module** command.

```
user@host> show chassis synchronization clock-module

Clock module on SCB0
  Current role      : master
  Current state     : locked to ge-4/1/9
    State for       : 0 days, 00 hrs, 00 mins, 45 secs
    State since     : Wed Jun 29 10:52:05 2011
  Monitored clock sources
    Interface      Type      Status
    ge-4/1/9       ptp       qualified-selected
```

**Meaning** The Monitored clock sources field shows that the ge-4/1/9 interface has the ptp type and is the qualified and selected centralized clock source.

### Verifying the Hybrid PTP Clock Source

**Purpose** Verify that the MX Series router recovers, selects, qualifies, and locks to the configured hybrid PTP clock source.

**Action** From operational mode, enter the **show chassis synchronization clock-module** command.

```
user@host> show chassis synchronization clock-module

Clock module on SCB0
  Current role      : master
  Current state     : locked to ge-4/1/9
    State for       : 0 days, 00 hrs, 00 mins, 15 secs
    State since     : Wed Jun 29 11:19:25 2011
  Monitored clock sources
    Interface      Type      Status
    ge-4/1/9       ptp-hybrid qualified-selected

Configured sources:

Interface      : ge-4/1/0
Status         : Primary      Index      : 218
Clock source state : Clk qualified Priority : 1
Configured QL    : ST3        ESMC QL    : DUS
Clock source type : ifd          Clock Event : Clock locked
Kernel flags     : Up,sec,
```

**Meaning** The Monitored clock sources field shows that the ge-4/1/9 interface has the ptp-hybrid type and is the qualified and selected centralized clock source. The Configured sources field shows that the ge-4/1/0 interface has the Clock locked Clock Event .

### Verifying the Retiming through the BITS External Interface

**Purpose** Verify that the MX Series router recovers, selects, qualifies, and locks to the configured clock source, and that the external clock is locked to the configured clock source.

**Action** From operational mode, enter the **show chassis synchronization extensive** command.

```
user@host> show chassis synchronization extensive

Current clock status : Locked
Clock locked to      : Primary

Configured interfaces:

Name      : external
Signal type : t1 (sf b8zs)
Rx status  : active
Tx status  : active
LED color  : green

Configured outputs:

Interface      : external
Tx status      : active
Minimum QL     : ST3           Tx QL           : ST3
Holdover mode  : disabled      Wander filter : disabled
Source mode    : line          Source Tx DNU : enabled
Holdover data  : valid
Current state  : locked to ge-4/0/1
State for      : 0 days, 00 hrs, 24 mins, 47 secs
State since    : Thu Sep  6 13:01:07 2012

Configured sources:

Interface      : external
Status         : Primary       Index          : 0
Clock source state : Clk qualified Priority      : Default(6)
Configured QL     : PRS        ESMC QL          : PRS
Clock source type  : extern     Clock Event     : Clock locked
Interface State   : Up,pri,

Interface      : ge-4/0/1
Status         : Secondary     Index          : 152
Clock source state : Clk qualified Priority      : Default(8)
Configured QL     : ST3        ESMC QL          : DUS
Clock source type  : ifd        Clock Event     : Clock qualified
Interface State   : Up,sec,ESMC TX(QL DUS/SSM 0xf),
```



**Meaning** The Configured interfaces field shows that the external interface receive and transmit statuses are active. The Configured outputs field shows that the current state is locked to ge-4/0/1. The Configured sources field shows that the external interface is the qualified and selected centralized clock source, and has the Clock locked Clock Event. The Configured sources field shows that the ge-4/0/1 interface is the secondary clock source, and has the Clock qualified Clock Event.

- Related Documentation**
- [synchronization on page 794](#)
  - [show chassis synchronization \(MX Series Routers\) on page 2161](#)
  - [Example: Configuring Precision Time Protocol on page 325](#)
  - [Configuring Hybrid Mode and ESMC Quality Level Mapping on page 329](#)
  - [Precision Time Protocol Overview on page 256](#)



## CHAPTER 9

# Configuring Network Services Mode

- [Network Services Mode Overview on page 361](#)
- [Restrictions on Junos OS Ethernet Network Services Mode and Enhanced Ethernet Network Services Mode Features for MX Series Routers on page 365](#)
- [Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 366](#)
- [Configuring Enhanced LAN Mode for a Virtual Chassis on page 366](#)
- [Limiting the Maximum Number of Logical Interfaces on MX Series Routers With MS-DPCs in Enhanced IP Network Services Mode on page 368](#)

## Network Services Mode Overview

---

A network services mode defines how the router chassis recognizes and uses certain modules. You can configure network services modes on MX Series 5G Universal Routing Platforms and on T4000 Core Routers with Type 5 FPCs.

On MX Series 5G Universal Routing Platforms, you can configure IP Network Services mode, Enhanced IP Network Services mode, Ethernet Network Services mode, or Enhanced Ethernet Network Services mode.

You can use either Enhanced IP Network Services mode or Enhanced Ethernet Network Services mode to improve the scaling and performance specific to filters in a subscriber access network that uses statically configured subscriber interfaces. For more information about using enhanced network services modes with firewall filters, see *Firewall Filters and Enhanced Network Services Mode Overview*.

On MX240, MX480, and MX960 routers, the MPC5E and MPC7E line cards power on only if the configured network services mode is **enhanced-ip** or **enhanced-ethernet**. All other MPCs work with any of the network services modes. MX2010 and MX2020 support only **enhanced-ip** and **enhanced-ethernet** network services modes.



**NOTE:** If Dense Port Concentrators (DPCs) in Ethernet Network Services mode or Enhanced Ethernet Network Services mode are up and running, you cannot configure the system for IP Network Services mode. You must first disable any Ethernet Network Services mode DPCs before switching to IP Network Services mode.



**NOTE:** When a chassis starts without any functioning FPCs, the Network Services mode defaults to IP Network Services. When the first FPC comes online, the configured Networks Services mode is applied.



**NOTE:** Starting from Junos OS Release 13.3, you can configure the Enhanced IP Network Services mode and Enhanced Ethernet Network Services mode on MX240, MX480 and MX960 routers with an SCBE2. Specify the **enhanced-ip** option or the **enhanced-ethernet** option at the **[edit chassis network-services]** hierarchy level.

You can configure T4000 Core Routers with Type 5 FPCs to run in Enhanced Network Services mode to enable improved virtual private LAN service (VPLS) MAC address learning. For more information, see [enhanced-mode](#).

[Table 61 on page 362](#) explains how different modules function when the MX Series 5G Universal Routing Platform chassis is configured to run in different network services modes.

**Table 61: Network Services Mode Functions**

Configuration Upon Boot or Configuration Change	Module Function
IP Network Services mode (default; upon boot)	<p>All modules except DPCE-X and DPCE-X-Q are powered on.</p> <p>Starting with Junos OS Release 15.1, you can limit the maximum number of logical interfaces on MX Series routers with MS-DPCs to 64,000 for enhanced IP network services mode. To do this, include the <b>limited-ifl-scaling</b> option with the <b>network-services enhanced-ip</b> statement at the <b>[edit chassis]</b> hierarchy level. Using the <b>limited-ifl-scaling</b> option prevents any collision of logical interface indices that can occur in a scenario in which you enable the Enhanced IP Network Services mode on the router which also contains an MS-DPC.</p>
Ethernet Network Services mode (upon boot)	<p>All modules are powered on. However, operating in Ethernet Network Services mode restricts certain BGP protocol functions and does not support Layer 3 VPN, unicast RPF, and source and destination class usage (SCU and DCU) functions. In addition, the number of externally configured filter terms is restricted to 64K.</p> <p>Ethernet Network Services mode provides support for only Layer 2.5 functions.</p>
Enhanced IP Network Services mode (upon boot)	<p>Only MPCs, MS-MPCs, and MS-DPCs are powered on.</p> <p><b>NOTE:</b> Only Multiservices DPCs (MS-DPCs) and MS-MPCs are powered on with the enhanced network services mode options. No other DPCs function with the enhanced network services mode options.</p>

Table 61: Network Services Mode Functions (continued)

Configuration Upon Boot or Configuration Change	Module Function
Enhanced Ethernet Network Services mode (upon boot)	Only MPCs, MS-MPCs, and MS-DPCs are powered on. All restrictions for operating in Ethernet Network Services mode apply.  <b>NOTE:</b> Only Multiservices DPCs (MS-DPCs) and MS-MPCs are powered on with the enhanced network services mode options. No other DPCs function with the enhanced network services mode options.
Change from IP Network Services mode to Ethernet Network Services mode	DPCE-X and DPCE-X-Q modules are powered on. No reboot is required. No impact to MPCs or MS-DPCs.
Change from Ethernet Network Services mode to IP Network Services mode	Invalid modification. No commit occurs. A warning message indicates if any FPCs (along with their slot location) must be offline before switching to other network services. No impact to MPCs or MS-DPCs.
Change from Enhanced IP Network Services mode to Enhanced Ethernet Network Services mode	No reboot is required. No impact to MPCs or MS-DPCs.
Change from IP Network Services mode to Enhanced IP Network Services mode	System reboot is required (PFE/FPCs)
Change from Ethernet Network Services mode to Enhanced Ethernet Network Services mode	Reboot is required.

For details on the Layer 2.5 support for Ethernet Network Services mode, see [Table 62 on page 365](#).

## Network Services on SCBE2

The following scenarios are to be noted when you use an MX Series router with an SCBE2:

- You must configure the **set chassis network-services (enhanced-ip | enhanced-ethernet)** configuration command and reboot the router to bring up the FPCs on the router. However, after the router reboots, the MS DPC, the MX FPC, and the ADPC are powered off.
- All the FPCs and DPCs in the router are powered off when you reboot the router without configuring either the enhanced-ip option or the enhanced-ethernet option at the **[edit chassis network-services]** hierarchy level.
- You must reboot the router when you configure or delete the enhanced-ip option or the enhanced-ethernet option at the **[edit chassis network-services]** hierarchy level. The following warning message, which prompts you to reboot the router, is displayed when you configure or delete the enhanced-ip or the enhanced-ethernet configuration statement at the **[edit chassis network-services]** hierarchy level.

```
'chassis'
WARNING: Chassis configuration for network services has been changed. A
```

```
system reboot is mandatory. Please reboot the system NOW. Continuing without
a reboot might result in unexpected system behavior.
commit complete
```

- Starting with Junos OS Release 14.2, you must perform a commit synchronization of the settings between dual Routing Engines under some specific conditions. If you configure or remove the **enhanced-ip** or the **enhanced-ethernet** option at the **[edit chassis network-services]** hierarchy level on one of the Routing Engines on a router that contains dual Routing Engines, perform commit synchronization of the settings between the two Routing Engines by entering the **commit synchronize** command at the **[edit system]** hierarchy level. In addition, you must reboot all of the Routing Engines on the router when the enhanced IP network services mode is changed. The reboot is performed to prevent any unexpected system behavior.



**NOTE:** Dynamic multicast replication mode is supported on SCBE2. Static multicast replication mode is not supported on SCBE2.



**NOTE:** If a route's next hop is a unicast next hop through integrated routing and bridging (IRB) and the corresponding MAC address is learned over a label-switched interface (LSI), the IRB derives the Layer 2 information from the indirect next hop for the LSI. If you configure the load-balance per-packet policy statement, the indirect next hop of the LSI points to a unilist, which has all the member links to load balance the packets toward the MPLS cloud. You should configure the enhanced-ip option to enable the unicast next hop for IRB to use the unilist as the Layer 2 forwards next hop and load balance the packets.

Release History Table

Release	Description
15.1	Starting with Junos OS Release 15.1, you can limit the maximum number of logical interfaces on MX Series routers with MS-DPCs to 64,000 for enhanced IP network services mode.
14.2	Starting with Junos OS Release 14.2, you must perform a commit synchronization of the settings between dual Routing Engines under some specific conditions.
13.3	Starting from Junos OS Release 13.3, you can configure the Enhanced IP Network Services mode and Enhanced Ethernet Network Services mode on MX240, MX480 and MX960 routers with an SCBE2.

#### Related Documentation

- Firewall Filters and Enhanced Network Services Mode Overview* in the *Junos OS Broadband Subscriber Management and Services Library*.
- [Table 62 on page 365](#)
- [enhanced-mode on page 639](#)

- [network-services on page 716](#)

## Restrictions on Junos OS Ethernet Network Services Mode and Enhanced Ethernet Network Services Mode Features for MX Series Routers

Table 62 on page 365 lists Junos OS feature restrictions when running in Ethernet Network Services mode or Enhanced Ethernet Network Services mode.

Table 62: Restricted Software Features in Ethernet Network Services Mode

Software Feature	Restriction in Ethernet Network Services Mode
BGP	<ul style="list-style-type: none"><li>• Data plane support applies only to Ethernet and MPLS.</li><li>• BGP only supports the following address families: inet labeled-unicast, inet unicast, inet-vpn unicast, l2vpn, and route-target.</li></ul>
L3VPN	<p>Layer 3 VPNs are supported. You can only include loopback interfaces in the Virtual Routing and Forwarding (VRF) instance. A maximum of two VRFs are supported. Each VRF can handle up to 10,000 routes.</p> <p>The <code>ping mpls l3vpn</code> operational mode command is also supported.</p>
Unicast RPF	Unicast reverse-path forwarding is disabled.
Source and destination class usage (SCU and DCU)	Source and Destination Class Usage is disabled.
Filter terms	The number of externally configured filter terms is restricted to 64 KB.
Prefixes	The number of supported prefixes is restricted to 32 K.



**NOTE:** MX Series routers supporting Layer 2.5 functions work as full-scale routers and they support interior gateway protocol (IGP), multicast routing protocols, and other routing features. The restrictions applicable on these routers are that the number of routes is limited and you cannot use BGP.

**Related Documentation**

- [Network Services Mode Overview on page 361](#)
- [Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 366](#)

## Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers

You can configure MX Series 5G Universal Routing Platforms to run in different network services modes. Each network services mode defines how the chassis recognizes and uses certain modules.

To configure the network services mode of an MX Series router:

1. Access the chassis hierarchy.

```
[edit]
user@host# edit chassis
```

2. Specify the network services mode that you want the router to use.

```
[edit chassis]
user@host# set network-services service
```

### Related Documentation

- [Network Services Mode Overview on page 361](#)
- [Firewall Filters and Enhanced Network Services Mode Overview](#)
- [Restrictions on Junos OS Ethernet Network Services Mode and Enhanced Ethernet Network Services Mode Features for MX Series Routers on page 365](#)
- [16-Port 10-Gigabit Ethernet MPC on MX Series Routers \(16x10GE 3D MPC\) Overview on page 6](#)
- [network-services on page 716](#)

## Configuring Enhanced LAN Mode for a Virtual Chassis

Configuring **network-services lan** assumes the system is running in **network-services enhanced-ip** mode.



**NOTE:** Be sure to delete any unsupported configurations before changing to enhanced-ip mode.

To configure MX-LAN Mode for an existing Virtual Chassis:

1. Log into the console for the master Routing Engine in the Virtual Chassis master router (member0-re0 in this procedure).
2. Access the chassis hierarchy.

```
{master:member0-re0}[edit]
user@host# edit chassis
```



3. Configuring MX-LAN Mode on member 0.

```
{master:member0-re0}[edit chassis]
user@host# set network-services lan
```

4. Commit the configuration.
5. When prompted to do so, reboot all Routing Engines in the Virtual Chassis.

```
{master:member0-re0}
user@host> request system reboot
```

The **request system reboot** command reboots both Routing Engines in each member router forming the Virtual Chassis.



**WARNING:** After the chassis configuration for network services has been changed, a system reboot is mandatory. Please reboot the system now. Continuing without a reboot might result in unexpected system behavior.

6. (Optional) Verify that enhanced IP network services has been properly configured for the Virtual Chassis.

Verify that MX-LAN Mode is configured on the master Routing Engine in the Virtual Chassis master router (member0-re0).

```
{master:member0-re0}
user@host> show chassis network-services
```

```
Network Services Mode: MX-LAN
```

You must reboot the router when you configure or delete the enhanced LAN mode on the router. Configuring the **network-services lan** option implies that the system is running in the enhanced IP mode. When you configure a device to function in MX-LAN mode, only the supported configuration statements and operational show commands that are available for enabling or viewing in this mode are displayed in the CLI interface. If your system contains parameters that are not supported in MX-LAN mode in a configuration file, you cannot commit those unsupported attributes. You must remove the settings that are not supported and then commit the configuration. After the successful CLI commit, a system reboot is required for the attributes to become effective. Similarly, if you remove the **network-services lan** statement, the system does not run in MX-LAN mode. Therefore, all of the settings that are supported outside of the MX-LAN mode are displayed and are available for definition in the CLI interface. If your configuration file contains settings that are supported only in MX-LAN mode, you must remove those attributes before you commit the configuration. After the successful CLI commit, a system reboot will be required for the CLI settings to take effect. The Layer 2 Next-Generation

CLI configuration settings are supported in MX-LAN mode. As a result, the typical MX Series-format of CLI configurations might differ in MX-LAN mode.

For more information about the Layer 2 Next-Generation (L2NG) mode, also called Enhanced Layer 2 software (ELS), and the hierarchy levels at which the different configuration statements and commands are available for various parameters, see *Using the Enhanced Layer 2 Software CLI*.

**Related  
Documentation**

- *Configuring Enhanced IP Network Services for a Virtual Chassis*
- [network-services on page 716](#)
- *request system reboot*
- [show chassis network-services on page 2015](#)

---

## Limiting the Maximum Number of Logical Interfaces on MX Series Routers With MS-DPCs in Enhanced IP Network Services Mode

---

Starting in Junos OS Release 15.1, you can impose a limitation on the maximum number of logical interfaces on MX Series routers with MS-DPCs to be 64,000 for enhanced IP network services mode. To impose that limit, include the **limited-ifl-scaling** option with the **network-services enhanced-ip** statement at the **[edit chassis]** hierarchy level. When network-services is configured as enhanced IP mode, the kernel increases the total number of logical interfaces to 256,000. However, MS-DPC line cards are not capable of handling more than 64,000 logical interfaces globally on a router. Using the **limited-ifl-scaling** option prevents the problem of a collision of logical interface indices that can occur in a scenario in which you enable enhanced IP services mode and an MS-DPC is also present in the same chassis. To support MS-DPCs with enhanced IP mode on the chassis, you must limit the maximum logical interfaces as 64,000, which is performed with the **limited-ifl-scaling** option.

To define the maximum number of logical interfaces on MX Series routers with MS-DPCs as 64,000, include the **limited-ifl-scaling** option with the **network-services enhanced-ip** statement at the **[edit chassis]** hierarchy level.

```
[edit chassis]
network-services enhanced-ip limited-ifl-scaling;
```

When the default network services mode on a router is IP services mode (by using the **network-services ip** statement), the maximum logical interfaces is set as 64,000. When you change the network services mode as enhanced IP, the chassis process sets a general configuration (GENCFG) script to the kernel that increases the maximum logical interfaces as 256,000. When you configure the **limited-ifl-scaling** option with the **network-services enhanced-ip** statement, the chassis process does not generate a message to the kernel to increase the number of logical interfaces. As a result, the kernel retains the maximum number of logical interfaces as 64,000.

If your router chassis is previously configured with enhanced IP services mode and without the **limited-ifl-scaling** option set, and if you later configure the setting to limit the logical

interfaces for MS-DPCs, the number of logical interfaces remains as 256,000 and it is not reduced. A cold reboot of the router must be performed in such a case to reduce the logical interfaces after you set the **limited-ift-scaling** option with the **network-services enhanced-ip** statement. When you enter the **limited-ift-scaling** option, none of the MPCs are moved to the offline state. All the optimization and scaling capabilities supported with enhanced IP mode apply to enhanced IP mode with the limitation of IFL scaling functionality.

Release History Table

Release	Description
15.1	Starting in Junos OS Release 15.1, you can impose a limitation on the maximum number of logical interfaces on MX Series routers with MS-DPCs to be 64,000 for enhanced IP network services mode.

Related Documentation

- [network-services on page 716](#)



## PART 2

# Configuring Chassis-Level Features

- [Configuring TX Matrix Chassis-Level Features on page 373](#)
- [Configuring TX Matrix Plus Chassis-Level Features on page 397](#)
- [Configuring M Series Chassis-Level Features on page 429](#)
- [Configuring MX Series Chassis-Level Features on page 437](#)
- [Configuring T Series Chassis-Level Features on page 447](#)
- [Configuring PTX Series Chassis-Level Features on page 453](#)
- [Configuring PIC-Specific Features on page 459](#)
- [Configuring Resynchronization of FPC Sequence Numbers when a new FPC is Brought Online on page 479](#)
- [Configuring Chassis Settings to Support Aggregated Devices on page 481](#)
- [Configuring Chassis Settings to Support Load Balancing on page 487](#)
- [Configuring Chassis Settings to Support Channelized Interfaces on page 495](#)
- [Configuring Chassis Settings to Support ATM Devices on page 501](#)
- [Configuring Chassis Settings for Routing Engines and Packet Forwarding Engines on page 505](#)
- [Configuring Chassis Settings for the Craft Interface on page 517](#)
- [Configuring Chassis Settings for Alarms on page 519](#)
- [Examples on page 575](#)



## CHAPTER 10

# Configuring TX Matrix Chassis-Level Features

- [TX Matrix Router and T640 Router Configuration Overview on page 373](#)
- [TX Matrix Router Chassis and Interface Names on page 376](#)
- [Using the Junos OS to Configure a T640 Router Within a Routing Matrix on page 378](#)
- [Configuring Junos OS to Upgrade and Downgrade Switch Interface Boards on a TX Matrix Router on page 379](#)
- [Configuring Junos OS to Enable the TX Matrix Router to Generate an Alarm If a T640 Router Stays Offline on page 380](#)
- [FIB Localization Overview on page 381](#)
- [Configuring FIB Localization on page 382](#)
- [Example: Configuring Packet Forwarding Engine FIB Localization on page 390](#)

### **TX Matrix Router and T640 Router Configuration Overview**

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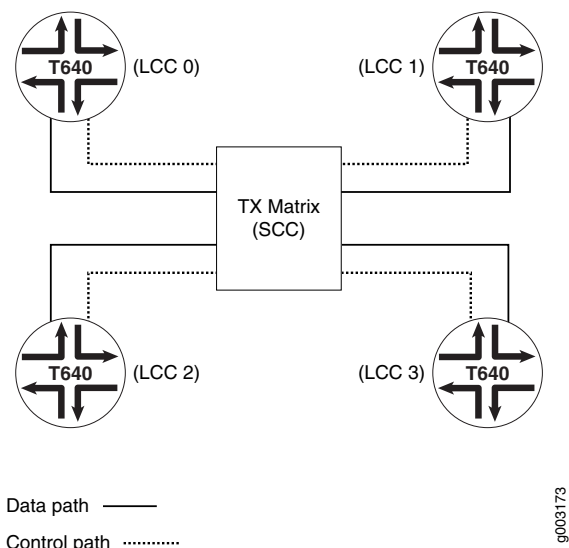
This topic provides an overview of configuring the TX Matrix router and T640 routers.

- [TX Matrix Router and T640 Router-Based Routing Matrix Overview on page 373](#)
- [Running Different Junos OS Releases on the TX Matrix Router and T640 Routers on page 374](#)
- [TX Matrix Router Software Upgrades and Reinstallation on page 375](#)
- [TX Matrix Router Rebooting Process on page 375](#)
- [Committing Configurations on the TX Matrix Router on page 375](#)
- [TX Matrix and T640 Router Configuration Groups on page 376](#)
- [Routing Matrix System Log Messages on page 376](#)

### **TX Matrix Router and T640 Router-Based Routing Matrix Overview**

A routing matrix is a multichassis architecture that consists of a TX Matrix router and from one to four T640 routers. From the perspective of the user interface, the routing matrix appears as a single router. The TX Matrix router controls all the T640 routers in the routing matrix, as shown in [Figure 9 on page 374](#).

Figure 9: Routing Matrix Composed of a TX Matrix Router and Four T640 Routers



You configure and manage the TX Matrix router and its T640 routers in the routing matrix through the CLI on the TX Matrix router. This means that the configuration file on the TX Matrix router is used for the entire routing matrix.

Because all configuration, troubleshooting, and monitoring are performed through the TX Matrix router, we do not recommend accessing its T640 routers directly (through the console port or management Ethernet [fxp0]). If you do, the following messages appear when you first start the CLI through a T640 router:

```
% cli
warning: This chassis is a Line Card Chassis (LCC) in a multichassis system.
warning: Use of interactive commands should be limited to debugging.
warning: Normal CLI access is provided by the Switch Card Chassis (SCC).
warning: Use 'request routing-engine login scc' to log into the SCC.
{master}
```

These messages appear because any configuration you commit on a T640 router is not propagated to the TX Matrix router or other T640 routers in the routing matrix. For details, see [“Committing Configurations on the TX Matrix Router”](#) on page 375.

## Running Different Junos OS Releases on the TX Matrix Router and T640 Routers

On a routing matrix, if you elect to run different Junos OS Releases on the TX Matrix router and T640 Routing Engines, a change in Routing Engine mastership can cause one or all T640 routers to be logically disconnected from the TX Matrix router.



**NOTE:** The routing matrix supports Release 7.0 and later versions of the Junos OS. All the master Routing Engines on the routing matrix must use the same software version. For information about hardware and software requirements, see the *TX Matrix Router Hardware Guide*.



## TX Matrix Router Software Upgrades and Reinstallation

By default, when you upgrade or reinstall software on the TX Matrix router, the new software image is distributed to the connected T640 routers. Software installed on a primary TX Matrix router is distributed to all connected primary T640 routers and the backup is distributed to all connected backup routers.

## TX Matrix Router Rebooting Process

When you reboot the TX Matrix router master Routing Engine, all the master Routing Engines in the connected T640 routers reboot. In addition, you can selectively reboot the master Routing Engine or any of the connected T640 routers.

## Committing Configurations on the TX Matrix Router

In a routing matrix composed of a TX Matrix router and T640 routers, all configuration must be performed on the TX Matrix router. Any configuration you commit on a T640 router is not propagated to the TX Matrix router or other T640 routers. Only configuration changes you commit on the TX Matrix router are propagated to all T640 routers. A commit on a TX Matrix router overrides any changes you commit on a T640 router.

If you issue the **commit** command, you commit the configuration to all the master Routing Engines in the routing matrix.

```
user@host# commit
scc-re0:
configuration check succeeds
lcc0-re0:
commit complete
lcc1-re0:
commit complete
scc-re0:
commit complete
```



**NOTE:** If a commit operation fails on any node, then the commit operation is not completed for the entire TX Matrix router.

If you issue the **commit synchronize** command on the TX Matrix router, you commit the configuration to all the master and backup Routing Engines in the routing matrix.

```
user@host# commit synchronize
scc-re0:
configuration check succeeds
lcc0-re1:
commit complete
lcc0-re0:
commit complete
lcc1-re1:
commit complete
lcc1-re0:
```

```
commit complete
scc-re1:
commit complete
scc-re0:
commit complete
```

## TX Matrix and T640 Router Configuration Groups

For routers that include two Routing Engines, you can specify two special group names—**re0** and **re1**. These two special group names apply to the Routing Engines in slots 0 and 1 of the TX Matrix router. In addition, the routing matrix supports group names for the Routing Engines for each T640 router: **lcc *n*-re0** and **lcc *n*-re1**. *n* identifies a T640 router from 0 through 3.

## Routing Matrix System Log Messages

You configure the T640 routers to forward their system log messages to the TX Matrix router at the **[edit system syslog host scc-master]** hierarchy level. For information about how to configure system log messages in a routing matrix, see *Junos OS System Log Overview* and *Configuring System Logging for a TX Matrix Router*.

### Related Documentation

- [Using the Junos OS to Configure a T640 Router Within a Routing Matrix on page 378](#)

## TX Matrix Router Chassis and Interface Names

The output from some CLI commands uses the terms SCC and **scc** (for *switch-card chassis*) to refer to the TX Matrix router. Similarly the terms LCC, and **lcc** as a prefix (for *line-card chassis*) refer to a T640 router in a routing matrix.

T640 routers are assigned LCC index numbers, 0 through 3, depending on the hardware setup of the routing matrix. A routing matrix can have up to four T640 routers, and each T640 router has up to eight FPCs. Therefore, the routing matrix can have up to 32 FPCs (0 through 31). The FPCs are configured at the **[edit chassis lcc *number*]** hierarchy level.

In the Junos OS CLI, an interface name has the following format:

```
type-fpc/pic/port
```

When you specify the FPC number, the Junos OS determines which T640 router contains the specified FPC based on the following assignment:

- On LCC 0, FPC hardware slots 0 through 7 correspond to FPC software numbers 0 through 7.
- On LCC 1, FPC hardware slots 0 through 7 correspond to FPC software numbers 8 through 15.

- On LCC 2, FPC hardware slots 0 through 7 correspond to FPC software numbers 16 through 23.
- On LCC 3, FPC hardware slots 0 through 7 correspond to FPC software numbers 24 through 31.

To convert FPC numbers in the T640 routers to the correct FPC in a routing matrix, use the conversion chart shown in [Table 63 on page 377](#). You can use the converted FPC number to configure the interfaces on the TX Matrix router in your routing matrix.

**Table 63: T640 to Routing Matrix FPC Conversion Chart**

FPC Numbering	T640 Routers							
LCC 0								
T640 FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	0	1	2	3	4	5	6	7
LCC 1								
T640 FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	8	9	10	11	12	13	14	15
LCC 2								
T640 FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	16	17	18	19	20	21	22	23
LCC 3								
T640 FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	24	25	26	27	28	29	30	31

Some examples include:

- In a routing matrix that contains **lcc 0** through **lcc 2**, **so-20/0/1** refers to FPC slot 4 of **lcc 2**.
- If you have a Gigabit Ethernet interface installed in FPC slot 7, PIC slot 0, port 0 of T640 router **LCC 3**, you can configure this interface on the TX Matrix router by including the **ge-31/0/0** statement at the **[edit interfaces]** hierarchy level.

```
[edit]
interfaces {
  ge-31/0/0 {
    unit 0 {
      family inet {
```

```

        address ip-address;
    }
}
}
}

```

**Related  
Documentation**

- [Using the Junos OS to Configure a T640 Router Within a Routing Matrix on page 378](#)

## Using the Junos OS to Configure a T640 Router Within a Routing Matrix

A routing matrix composed of a TX Matrix router and T640 routers supports the same chassis configuration statements as a standalone router (except **ce1**, **ct3**, **mlfr-uni-nni-bundles**, **sparse-dlcis**, and **vtmapping**). By including the **lcc** statement at the **[edit chassis]** hierarchy level, you configure PIC-specific features, such as framing, on specific T640 routers. In addition, a routing matrix has two more chassis configuration statements, **online-expected** and **offline**.

To configure a T640 router that is connected to a TX Matrix router, include the **lcc** statement at the **[edit chassis]** hierarchy level:

```

[edit chassis]
lcc number;

```

*number* can be 0 through 3.

To configure a T640 router within a routing matrix, include the following statements at the **[edit chassis *lcc number*]** hierarchy level:

```

[edit chassis lcc number]
fpc slot-number { # Use the hardware FPC slot number
pic pic-number {
    atm-cell-relay-accumulation;
    atm-l2circuit-mode (cell | aal5 | trunk trunk);
    framing (sdh | sonet);
    idle-cell-format {
        itu-t;
        payload-pattern payload-pattern-byte;
    }
    max-queues-per-interface (8 | 4);
    no-concatenate;
}
offline;
online-expected;
q-pic-large-buffer {
    large-scale;
}
}

```



**NOTE:** For the FPC slot number, specify the actual hardware slot number (numbered 0 through 7) as labeled on the T640 router chassis. Do not use the corresponding software FPC number shown in [Table 63 on page 377](#).

For information about how to configure the **online-expected** and **offline** configuration statements, see “[Configuring Junos OS to Enable the TX Matrix Router to Generate an Alarm If a T640 Router Stays Offline](#)” on page 380.

#### Related Documentation

- [TX Matrix Router and T640 Router Configuration Overview on page 373](#)
- [TX Matrix Router Chassis and Interface Names on page 376](#)
- [Configuring Junos OS to Upgrade and Downgrade Switch Interface Boards on a TX Matrix Router on page 379](#)
- [Configuring Junos OS to Enable the TX Matrix Router to Generate an Alarm If a T640 Router Stays Offline on page 380](#)

## Configuring Junos OS to Upgrade and Downgrade Switch Interface Boards on a TX Matrix Router

The Junos OS does not support mixed mode operation of Switch Interface Boards (SIBs). To successfully upgrade 1.0 SIBs to 2.0 SIBs in a TX Matrix environment, you must force all newly installed 2.0 SIBs to operate in 1.0 mode until the upgrade is complete.

1. [Configuring Junos OS to Upgrade Switch Interface Boards on a TX Matrix Router on page 379](#)
2. [Configuring Junos OS to Downgrade Switch Interface Boards on a TX Matrix Router on page 380](#)

### Configuring Junos OS to Upgrade Switch Interface Boards on a TX Matrix Router

To configure the TX Matrix router to support a SIB upgrade, include the **fabric upgrade-mode** statement at the **[edit chassis]** hierarchy level and commit the changes to update the configuration. Configuration changes that you commit on the TX Matrix router are propagated to all T640 routers in a routing matrix.

```
[edit chassis]
user@host# set chassis fabric upgrade-mode
user@host# commit
```

The **fabric upgrade-mode** statement instructs the newly installed 2.0 boards to operate in 1.0 mode. When all 1.0 boards have been replaced by 2.0 boards, remove the **fabric upgrade-mode** statement from the configuration hierarchy, and commit the changes again.

```
[edit chassis]
user@host# delete chassis fabric upgrade-mode
```

```
user@host# commit
```

In the TX Matrix routing environment, use the **request chassis sib (offline | online)** command sequence to power cycle the newly installed 2.0 SIBs. Power cycling is not needed in a single chassis T640 environment.

```
user@host> request chassis sib offline slot slot-number  
user@host> request chassis sib online slot slot-number
```

As the system discovers each new board, the 2.0 ASIC enables 2.0 features, and the upgrade is complete.

## Configuring Junos OS to Downgrade Switch Interface Boards on a TX Matrix Router

To downgrade your 2.0 SIBs to 1.0 SIBs, follow the upgrade procedure. When you replace the first 2.0 SIB with a 1.0 SIB, the system operates in a downgraded 1.0 mode until all 2.0 SIBs are replaced, and the newly installed 1.0 SIBs are power cycled using a **request chassis sib (offline | online)** command sequence.



**NOTE:** The TX Matrix switch fabric supports 2.0 SIBs for enabling Gigabit FPC-4 and Type 4 PICs. Gigabit FPC-4 devices are not compatible with 1.0 SIBs. Therefore, if you are planning to downgrade from 2.0 SIBs to 1.0 SIBs, you must take all Gigabit FPC-4 devices offline to ensure that the link between the new SIBs and the FPC does not fail.

### Related Documentation

- [TX Matrix Router and T640 Router Configuration Overview on page 373](#)
- [Using the Junos OS to Configure a T640 Router Within a Routing Matrix on page 378](#)

## Configuring Junos OS to Enable the TX Matrix Router to Generate an Alarm If a T640 Router Stays Offline

---

By default, the Junos OS enables all the T640 routers in the routing matrix to come online. The Junos OS also allows you to configure all the T640 routers so that if they do not come online, an alarm is sent by the TX Matrix router.

To configure this alarm, include the **online-expected** statement at the **[edit chassis lcc *number*]** hierarchy level:

```
[edit chassis lcc number]  
online-expected;
```

If you do not want a T640 router to be part of the routing matrix, you can configure it to be offline. This is useful when you are performing maintenance on a T640 router. When the T640 router is ready to come back online, delete the **offline** configuration statement.

To configure a T640 router so that it is offline, include the **offline** statement at the **[edit chassis lcc *number*]** hierarchy level:

```
[edit chassis lcc number]
offline;
```



**NOTE:** If you do not configure the `online-expected` or `offline` statement, any T640 router that is part of the routing matrix is allowed to come online. However, if a T640 router does not come online, the TX Matrix router does not generate an alarm.

#### Related Documentation

- [TX Matrix Router and T640 Router Configuration Overview on page 373](#)
- [Using the Junos OS to Configure a T640 Router Within a Routing Matrix on page 378](#)

## FIB Localization Overview

On Juniper Networks routers, the forwarding table on the Packet Forwarding Engine, also referred to as forwarding information base (FIB), maintains the complete set of active IPv4 (inet) and IPv6 (inet6) routes. In Junos OS Release 11.4 and later, you can configure FIB localization for a Packet Forwarding Engine. FIB-localization characterizes Packet Forwarding Engines in a router as either “FIB-remote” or “FIB-local”.

FIB-local Packet Forwarding Engines install all routes from the default inet and inet6 route tables into the Packet Forwarding Engine forwarding hardware. FIB-remote Packet Forwarding Engines do not install all the routes for the inet and inet6 routing tables. However, they do maintain local and multicast routes.

FIB-remote Packet Forwarding Engines create a default (0/0) route in the Packet Forwarding Engine forwarding hardware for the inet and inet6 table. The default route references a next-hop or a unilist of next-hops that identify the FIB-local Packet Forwarding Engines that can perform full IP table lookups for received packets.

FIB-remote Packet Forwarding Engines forward received packets to the set of FIB-local Packet Forwarding Engines. The FIB-local Packet Forwarding Engines then perform full IP longest-match lookup on the destination address and forward the packet appropriately. The packet might be forwarded out of an egress interface on the same FIB-local Packet Forwarding Engine that performed the lookup or an egress interface on a different FIB-local or FIB-remote Packet Forwarding Engine. The packet might also be forwarded out of an FPC where FIB localization is not configured. The packet might also be received locally at the Routing Engine.

When FIB localization is configured on a router with some Flexible PIC Concentrators (FPCs) being FIB-remote and some others being FIB-local, packets arriving on the interface of the FIB-remote FPC are forwarded to one of the FIB-local FPCs for route lookup and forwarding.

The advantage of configuring FIB localization is that it enables upgrading the hardware forwarding table capacity of FIB-local Packet Forwarding Engines while not requiring upgrades to the FIB-remote Packet Forwarding Engines. In a typical network deployment, FIB-local Packet Forwarding Engines are core-facing, while FIB-remote Packet Forwarding

Engines are edge-facing. The FIB-remote Packet Forwarding Engines also load-balance traffic over the available set of FIB-local Packet Forwarding Engines.

FIB localization is currently supported on T320, T640, T1600, and MX Series routers.



**NOTE:** On MX Series routers, you can configure multiservices Dense Port Concentrators (DPCs) as FIB-remote. However, only Modular Port Concentrators (MPCs) can be configured as FIB-local. FIB-localization is supported only for redundant link services intelligent queuing interfaces that carry Multilink Point-to-Point Protocol (MLPPP) traffic.

**Related  
Documentation**

- [Example: Configuring Packet Forwarding Engine FIB Localization on page 383](#)

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## Configuring FIB Localization

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- [FIB Localization Overview on page 382](#)
- [Example: Configuring Packet Forwarding Engine FIB Localization on page 383](#)
- [Configuration Statements on page 388](#)

### FIB Localization Overview

On Juniper Networks routers, the forwarding table on the Packet Forwarding Engine, also referred to as forwarding information base (FIB), maintains the complete set of active IPv4 (inet) and IPv6 (inet6) routes. In Junos OS Release 11.4 and later, you can configure FIB localization for a Packet Forwarding Engine. FIB-localization characterizes Packet Forwarding Engines in a router as either “FIB-remote” or “FIB-local”.

FIB-local Packet Forwarding Engines install all routes from the default inet and inet6 route tables into the Packet Forwarding Engine forwarding hardware. FIB-remote Packet Forwarding Engines do not install all the routes for the inet and inet6 routing tables. However, they do maintain local and multicast routes.

FIB-remote Packet Forwarding Engines create a default (0/0) route in the Packet Forwarding Engine forwarding hardware for the inet and inet6 table. The default route references a next-hop or a unilist of next-hops that identify the FIB-local Packet Forwarding Engines that can perform full IP table lookups for received packets.

FIB-remote Packet Forwarding Engines forward received packets to the set of FIB-local Packet Forwarding Engines. The FIB-local Packet Forwarding Engines then perform full IP longest-match lookup on the destination address and forward the packet appropriately. The packet might be forwarded out of an egress interface on the same FIB-local Packet Forwarding Engine that performed the lookup or an egress interface on a different FIB-local or FIB-remote Packet Forwarding Engine. The packet might also be forwarded out of an FPC where FIB localization is not configured. The packet might also be received locally at the Routing Engine.



When FIB localization is configured on a router with some Flexible PIC Concentrators (FPCs) being FIB-remote and some others being FIB-local, packets arriving on the interface of the FIB-remote FPC are forwarded to one of the FIB-local FPCs for route lookup and forwarding.

The advantage of configuring FIB localization is that it enables upgrading the hardware forwarding table capacity of FIB-local Packet Forwarding Engines while not requiring upgrades to the FIB-remote Packet Forwarding Engines. In a typical network deployment, FIB-local Packet Forwarding Engines are core-facing, while FIB-remote Packet Forwarding Engines are edge-facing. The FIB-remote Packet Forwarding Engines also load-balance traffic over the available set of FIB-local Packet Forwarding Engines.

FIB localization is currently supported on T320, T640, T1600, and MX Series routers.



**NOTE:** On MX Series routers, you can configure multiservices Dense Port Concentrators (DPCs) as FIB-remote. However, only Modular Port Concentrators (MPCs) can be configured as FIB-local. FIB-localization is supported only for redundant link services intelligent queuing interfaces that carry Multilink Point-to-Point Protocol (MLPPP) traffic.

**See Also** • [Example: Configuring Packet Forwarding Engine FIB Localization on page 383](#)

## Example: Configuring Packet Forwarding Engine FIB Localization

This example shows how to configure Packet Forwarding Engine FIB localization.

- [Requirements on page 383](#)
- [Overview on page 384](#)
- [Configuration on page 384](#)
- [Verification on page 386](#)

### Requirements

Before you begin:

1. Configure device interfaces and loopback interface addresses.
2. Configure static routes.
3. Configure OSPF and OSPFv3 and make sure that OSPF adjacencies and OSPF routes to loopback addresses are established.

This example uses the following hardware and software components:

- A T320, T640, T1600, or MX Series router.
- Junos OS Release 11.4 or later running on the router for T-Series routers. Junos OS Release 12.3 or later running on the router for MX Series routers..

## Overview

In this example, you configure the chassis for IPv4 and IPv6 routes and FIB localization on Router R0 and then configure the edge-facing Packet Forwarding Engines on FPC0 as **fib-remote** and the core-facing Packet Forwarding Engines on FPC1 and FPC2 as **fib-local**. You then configure a routing policy named **fib-policy** with the **no-route-localize** option to ensure that all routes from a specified route filter are installed on the FIB-remote FPC.

## Configuration

**CLI Quick Configuration** To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

```
R0
set chassis fpc 0 route-localization fib-remote
set chassis fpc 1 route-localization fib-local
set chassis fpc 2 route-localization fib-local
set chassis route-localization inet
set chassis route-localization inet6
set policy-options policy-statement fib-policy term a from route-filter 4.4.4.4/32 exact
set policy-options policy-statement fib-policy term a then no-route-localize
set policy-options policy-statement fib-policy term b from route-filter fec0:4444::4/128 exact
set policy-options policy-statement fib-policy term b then no-route-localize
set policy-options policy-statement fib-policy then accept
set routing-options forwarding-table export fib-policy
```

**Step-by-Step Procedure** The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see the *CLI User Guide*.

To configure Packet Forwarding Engine FIB localization:

1. Configure route localization or FIB localization for IPv4 and IPv6 traffic.

```
[edit chassis]
user@R0# set route-localization inet
user@R0# set route-localization inet6
```

2. Configure the Packet Forwarding Engine of an FPC as either **fib-local** or **fib-remote**.

```
[edit chassis]
user@R0# set fpc 0 route-localization fib-remote
user@R0# set fpc 1 route-localization fib-local
user@R0# set fpc 2 route-localization fib-local
```

3. Configure the routing policy by including the **no-route-localize** statement to enable the forwarding table policy to mark route prefixes such that the routes are installed into forwarding hardware on the FIB-remote Packet Forwarding Engines.

```
[edit policy-options]
user@R0# set policy-statement fib-policy term a from route-filter 4.4.4.4/32 exact
user@R0# set policy-statement fib-policy term a then no-route-localize
user@R0# set policy-statement fib-policy term b from route-filter fec0:4444::4/128
exact
user@R0# set policy-statement fib-policy term b then no-route-localize
user@R0# set policy-statement fib-policy then accept
```

4. Enable the routing policy in the forwarding table by configuring the forwarding table with the **fib-policy** statement.

```
[edit routing-options]
user@R0# set forwarding-table export fib-policy
```



**NOTE:** At least, one Packet Forwarding Engine must be configured as **fib-local** for the commit operation to be successful. If you do not configure **fib-local** for the Packet Forwarding Engine, the CLI displays an appropriate error message and the commit fails.

**Results** From configuration mode, confirm your configuration by entering the **show chassis** and **show policy-options** commands. If the output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

```
user@R0# show chassis
fpc 0 {
  route-localization fib-remote;
}
fpc 1 {
  route-localization fib-local;
}
fpc 2 {
  route-localization fib-local;
}
route-localization {
  inet;
  inet6;
}
```

```
user@R0# show policy-options
policy-statement fib-policy {
  term a {
    from {
      route-filter 4.4.4.4/32 exact;
```

```

    }
    then no-route-localize;
  }
  term b {
    from {
      route-filter fec0:4444::4/128 exact;
    }
    then no-route-localize;
  }
  then accept;
}
}

```

### Verification

Confirm that the configuration is working properly.

- [Verifying Policy Configuration on page 386](#)
- [Verifying FIB-Localization Configuration on page 386](#)
- [Verifying Routes After the Policy Is Applied on page 387](#)

#### **Verifying Policy Configuration**

**Purpose** Verify that the configured policy exists.

**Action** Issue the **show policy fib-policy** command to check that the configured policy *fib-policy* exists.

```

user@R0> show policy fib-policy
Policy fib-policy:
  Term a:
    from
      route filter:
        4.4.4.4/32 exact
    then no-route-localize
  Term b:
    from
      route filter:
        fec0:4444::4/128 exact
    then no-route-localize
  Term unnamed:
    then accept

```

#### **Verifying FIB-Localization Configuration**

**Purpose** Verify FIB-localization configuration details by using the **show route localization** and **show route localization detail** commands.

**Action** user@R0> show route localization

```
FIB localization ready FPCs (and FIB-local Forwarding Engine addresses)
FIB-local: FPC2(4,5)
FIB-remote: FPC0, FPC1
Normal: FPC3, FPC4, FPC5, FPC6, FPC7
```

user@R0> show route localization detail

```
FIB localization ready FPCs (and FIB-local Forwarding Engine addresses)
FIB-local: FPC2(4,5)
FIB-remote: FPC0, FPC1
Normal: FPC3, FPC4, FPC5, FPC6, FPC7
FIB localization configuration
Protocols: inet, inet6
FIB-local: FPC2
FIB-remote: FPC0, FPC1
Forwarding Engine addresses
FPC0: 1
FPC1: 2
FPC2: 4, 5
FPC3: 6
FPC4: 8
FPC5: 11
FPC6: 13
FPC7: 15
```

### *Verifying Routes After the Policy Is Applied*

**Purpose** Verify that routes with the `no-route-localize` policy option are installed on the fib-remote FPC.

**Action** user@R0> show route 4.4.4.4/32 extensive

```
inet.0: 30 destinations, 30 routes (29 active, 0 holddown, 1 hidden)
4.4.4.4/32 (1 entry, 1 announced)
TSI:
KRT in-kernel 4.4.4.4/32 -> {130.168.0.2 Flags no-localize}
                        ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
      *Static Preference: 5
        Next hop type: Router, Next hop index: 629
        Next-hop reference count: 3
        Next hop: 130.168.0.2 via ge-1/0/4.0, selected
        State: <Active Int="">
Age: 10:33
Task: RT
Announcement bits (1): 0-KRT
AS path: I</Active
>
```

**See Also** • [FIB Localization Overview on page 381](#)

- [fib-local on page 388](#)
- [fib-remote on page 389](#)
- [no-route-localize on page 389](#)
- [route-localization on page 390](#)


## Configuration Statements

- [fib-local on page 388](#)
- [fib-remote on page 389](#)
- [no-route-localize on page 389](#)
- [route-localization on page 390](#)

---

### **`fib-local`**

---

<b>Syntax</b>	<code>fib-local;</code>
<b>Hierarchy Level</b>	<code>[edit chassis fpc <i>fpc-number</i> route-localization]</code>
<b>Release Information</b>	Statement introduced in Junos OS Release 11.4.
<b>Description</b>	Configure the Packet Forwarding Engine on an FPC as FIB-local. <div><div></div><div><p><b>NOTE:</b> At least, one Packet Forwarding Engine must be configured as <code>fib-local</code> for the commit operation to be successful. If you do not configure <code>fib-local</code> for the Packet Forwarding Engine, the CLI displays an appropriate error message and the commit fails.</p></div></div>
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>See Also</b>	<ul style="list-style-type: none"><li>• <a href="#">Example: Configuring Packet Forwarding Engine FIB Localization on page 383</a></li></ul>



**NOTE:** At least, one Packet Forwarding Engine must be configured as `fib-local` for the commit operation to be successful. If you do not configure `fib-local` for the Packet Forwarding Engine, the CLI displays an appropriate error message and the commit fails.

## fib-remote

<b>Syntax</b>	<code>fib-remote;</code>
<b>Hierarchy Level</b>	<code>[edit chassis fpc <i>fpc-number</i> route-localization]</code>
<b>Release Information</b>	Statement introduced in Junos OS Release 11.4.
<b>Description</b>	Configure the Packet Forwarding Engine on an FPC as FIB-remote.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>See Also</b>	<ul style="list-style-type: none"> <li>• <a href="#">Example: Configuring Packet Forwarding Engine FIB Localization on page 383</a></li> </ul>

## no-route-localize

<b>Syntax</b>	<code>no-route-localize;</code>
<b>Hierarchy Level</b>	<code>[edit policy-options policy-statement <i>policy-name</i> term <i>term-name</i> then]</code>
<b>Release Information</b>	Statement introduced in Junos OS Release 11.4.
<b>Description</b>	Enforce installation of routes on all FIB-remote Packet Forwarding Engines.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
<b>See Also</b>	<ul style="list-style-type: none"> <li>• <a href="#">Example: Configuring Packet Forwarding Engine FIB Localization on page 383</a></li> </ul>

## route-localization

---

<b>Syntax</b>	<pre>route-localization {   inet;   inet6; }</pre>
<b>Hierarchy Level</b>	[edit chassis]
<b>Release Information</b>	Statement introduced in Junos OS Release 11.4.
<b>Description</b>	Configure FIB localization for IPv4 and IPv6 routes.
<b>Options</b>	<b>inet</b> —Configure FIB localization for IPv4 routes.  <b>inet6</b> —Configure FIB localization for IPv6 routes.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>See Also</b>	<ul style="list-style-type: none"><li>• <a href="#">Example: Configuring Packet Forwarding Engine FIB Localization on page 383</a></li></ul>

## Example: Configuring Packet Forwarding Engine FIB Localization

---

This example shows how to configure Packet Forwarding Engine FIB localization.

- [Requirements on page 390](#)
- [Overview on page 391](#)
- [Configuration on page 391](#)
- [Verification on page 393](#)

### Requirements

Before you begin:

1. Configure device interfaces and loopback interface addresses.
2. Configure static routes.
3. Configure OSPF and OSPFv3 and make sure that OSPF adjacencies and OSPF routes to loopback addresses are established.

This example uses the following hardware and software components:

- A T320, T640, T1600, or MX Series router.



- Junos OS Release 11.4 or later running on the router for T-Series routers. Junos OS Release 12.3 or later running on the router for MX Series routers..

## Overview

In this example, you configure the chassis for IPv4 and IPv6 routes and FIB localization on Router R0 and then configure the edge-facing Packet Forwarding Engines on FPC0 as **fib-remote** and the core-facing Packet Forwarding Engines on FPC1 and FPC2 as **fib-local**. You then configure a routing policy named **fib-policy** with the **no-route-localize** option to ensure that all routes from a specified route filter are installed on the FIB-remote FPC.

## Configuration

**CLI Quick Configuration** To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

```
R0
set chassis fpc 0 route-localization fib-remote
set chassis fpc 1 route-localization fib-local
set chassis fpc 2 route-localization fib-local
set chassis route-localization inet
set chassis route-localization inet6
set policy-options policy-statement fib-policy term a from route-filter 4.4.4.4/32 exact
set policy-options policy-statement fib-policy term a then no-route-localize
set policy-options policy-statement fib-policy term b from route-filter fec0:4444::4/128 exact
set policy-options policy-statement fib-policy term b then no-route-localize
set policy-options policy-statement fib-policy then accept
set routing-options forwarding-table export fib-policy
```

**Step-by-Step Procedure** The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see the *CLI User Guide*.

To configure Packet Forwarding Engine FIB localization:

1. Configure route localization or FIB localization for IPv4 and IPv6 traffic.

```
[edit chassis]
user@R0# set route-localization inet
user@R0# set route-localization inet6
```

2. Configure the Packet Forwarding Engine of an FPC as either **fib-local** or **fib-remote**.

```
[edit chassis]
user@R0# set fpc 0 route-localization fib-remote
user@R0# set fpc 1 route-localization fib-local
user@R0# set fpc 2 route-localization fib-local
```

3. Configure the routing policy by including the **no-route-localize** statement to enable the forwarding table policy to mark route prefixes such that the routes are installed into forwarding hardware on the FIB-remote Packet Forwarding Engines.

```
[edit policy-options]
user@R0# set policy-statement fib-policy term a from route-filter 4.4.4.4/32 exact
user@R0# set policy-statement fib-policy term a then no-route-localize
user@R0# set policy-statement fib-policy term b from route-filter fec0:4444::4/128
exact
user@R0# set policy-statement fib-policy term b then no-route-localize
user@R0# set policy-statement fib-policy then accept
```

4. Enable the routing policy in the forwarding table by configuring the forwarding table with the **fib-policy** statement.

```
[edit routing-options]
user@R0# set forwarding-table export fib-policy
```



**NOTE:** At least, one Packet Forwarding Engine must be configured as **fib-local** for the commit operation to be successful. If you do not configure **fib-local** for the Packet Forwarding Engine, the CLI displays an appropriate error message and the commit fails.

**Results** From configuration mode, confirm your configuration by entering the **show chassis** and **show policy-options** commands. If the output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

```
user@R0# show chassis
fpc 0 {
  route-localization fib-remote;
}
fpc 1 {
  route-localization fib-local;
}
fpc 2 {
  route-localization fib-local;
}
route-localization {
  inet;
  inet6;
}
```

```
user@R0# show policy-options
policy-statement fib-policy {
  term a {
    from {
      route-filter 4.4.4.4/32 exact;
```

```

    }
    then no-route-localize;
  }
  term b {
    from {
      route-filter fec0:4444::4/128 exact;
    }
    then no-route-localize;
  }
  then accept;
}
}

```

## Verification

Confirm that the configuration is working properly.

- [Verifying Policy Configuration on page 393](#)
- [Verifying FIB-Localization Configuration on page 393](#)
- [Verifying Routes After the Policy Is Applied on page 394](#)

### Verifying Policy Configuration

**Purpose** Verify that the configured policy exists.

**Action** Issue the **show policy fib-policy** command to check that the configured policy *fib-policy* exists.

```

user@R0> show policy fib-policy
Policy fib-policy:
  Term a:
    from
      route filter:
        4.4.4.4/32 exact
    then no-route-localize
  Term b:
    from
      route filter:
        fec0:4444::4/128 exact
    then no-route-localize
  Term unnamed:
    then accept

```

### Verifying FIB-Localization Configuration

**Purpose** Verify FIB-localization configuration details by using the **show route localization** and **show route localization detail** commands.

**Action** user@R0> show route localization

```
FIB localization ready FPCs (and FIB-local Forwarding Engine addresses)
FIB-local: FPC2(4,5)
FIB-remote: FPC0, FPC1
Normal: FPC3, FPC4, FPC5, FPC6, FPC7
```

user@R0> show route localization detail

```
FIB localization ready FPCs (and FIB-local Forwarding Engine addresses)
FIB-local: FPC2(4,5)
FIB-remote: FPC0, FPC1
Normal: FPC3, FPC4, FPC5, FPC6, FPC7
FIB localization configuration
Protocols: inet, inet6
FIB-local: FPC2
FIB-remote: FPC0, FPC1
Forwarding Engine addresses
FPC0: 1
FPC1: 2
FPC2: 4, 5
FPC3: 6
FPC4: 8
FPC5: 11
FPC6: 13
FPC7: 15
```

### Verifying Routes After the Policy Is Applied

**Purpose** Verify that routes with the **no-route-localize** policy option are installed on the fib-remote FPC.

**Action** user@R0> show route 4.4.4.4/32 extensive

```
inet.0: 30 destinations, 30 routes (29 active, 0 holddown, 1 hidden)
4.4.4.4/32 (1 entry, 1 announced)
TSI:
KRT in-kernel 4.4.4.4/32 -> {130.168.0.2 Flags no-localize}
                        ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
*Static Preference: 5
  Next hop type: Router, Next hop index: 629
  Next-hop reference count: 3
  Next hop: 130.168.0.2 via ge-1/0/4.0, selected
  State: <Active Int="">
Age: 10:33
Task: RT
Announcement bits (1): 0-KRT
AS path: I</Active
>
```

**Related Documentation**

- [FIB Localization Overview on page 381](#)

- [fib-local on page 388](#)
- [fib-remote on page 389](#)
- [no-route-localize on page 389](#)
- [route-localization on page 390](#)



# Configuring TX Matrix Plus Chassis-Level Features

- [TX Matrix Plus Router Configuration Overview on page 397](#)
- [TX Matrix Plus Router Chassis and Interface Names on page 402](#)
- [Using the Junos OS to Configure a T1600 or T4000 Router Within a Routing Matrix on page 405](#)
- [Configuring Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 or T4000 Router Stays Offline on page 406](#)
- [Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 407](#)
- [Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 412](#)
- [Configuring Junos OS to Upgrade a T4000 Router to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 419](#)
- [Configuring Junos OS to Upgrade the T640 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 427](#)

## TX Matrix Plus Router Configuration Overview

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This topic provides an overview of configuring the TX Matrix Plus router and its connected routers.

- [TX Matrix Plus Router and Router-Based Routing Matrix Overview on page 398](#)
- [Running Different Junos OS Releases on the TX Matrix Plus Router and T1600 or T4000 Routers on page 399](#)
- [TX Matrix Plus Router Software Upgrades and Reinstallation on page 399](#)
- [TX Matrix Plus Router Rebooting Process on page 399](#)
- [TX Matrix Plus Router Routing Engine Rebooting Sequence on page 399](#)
- [TX Matrix Plus Router Management Ethernet Interfaces on page 399](#)
- [TX Matrix Plus Router Internal Ethernet Interfaces on page 400](#)
- [Routing Matrix-Based T1600 or T4000 Router Internal Ethernet Interfaces on page 400](#)
- [Committing Configurations on the TX Matrix Plus Router on page 400](#)

- [Routing Matrix Configuration Groups on page 401](#)
- [Routing Matrix System Log Messages on page 401](#)

## TX Matrix Plus Router and Router-Based Routing Matrix Overview

A routing matrix based on a Juniper Networks TX Matrix Plus Router is a multichassis architecture composed of one TX Matrix Plus router and one of the following line-card chassis (LCC) configurations:

- TXP-T1600 configuration—Supports up to four interconnected Juniper Networks T1600 Core Routers.
- TXP-T1600-3D configuration—Supports up to eight interconnected Juniper Networks T1600 Core Routers.
- TXP-4000-3D configuration—Supports up to four interconnected Juniper Networks T4000 Core Routers.
- TXP-Mixed-LCC-3D configuration—Supports the following combinations of T1600 and T4000 routers:
  - Six T1600 routers and one T4000 router
  - Four T1600 routers and two T4000 routers
  - Two T1600 routers and three T4000 routers



**NOTE:** The TXP-T1600-3D, TXP-T4000-3D, and TXP-Mixed-LCC-3D configurations use 3D SIBs (TXP-F13-3D and TXP-F2S-3D SIBs on the switch-fabric chassis or the SFC and TXP-LCC-3D SIB on the LCCs). For more details on the hardware components used in the routing matrix with TX Matrix Plus Router, see the *TX Matrix Plus Router Hardware Guide*.

From the perspective of the user interface, the routing matrix appears as a single router. The TX Matrix Plus router controls all the T1600 or T4000 routers in the routing matrix.

You configure and manage the TX Matrix Plus router and its T1600 or T4000 routers in the routing matrix through the CLI on the TX Matrix Plus router. This means that the configuration file on the TX Matrix Plus router is used for the entire routing matrix.

Because all configuration, troubleshooting, and monitoring are performed through the TX Matrix Plus router, we do not recommend accessing its T1600 or T4000 routers directly (through the console port or management Ethernet interface [**em0**]). If you do, the following messages appear when you first start the CLI through a T1600 or T4000 router:

warning: This chassis is a Line Card Chassis (LCC) in a multichassis system.  
warning: Use of interactive commands should be limited to debugging.  
warning: Normal CLI access is provided by the Switch Fabric Chassis (SFC).  
warning: Please logout and log into the SFC to use CLI.



These messages appear because any configuration you commit on a T1600 or a T4000 router is not propagated to the TX Matrix Plus router or other T1600 or T4000 routers in the routing matrix. For details, see [“Committing Configurations on the TX Matrix Plus Router” on page 400](#).

## Running Different Junos OS Releases on the TX Matrix Plus Router and T1600 or T4000 Routers

On a routing matrix composed of a TX Matrix Plus router and T1600 or T4000 routers, if you elect to run different Junos OS Releases on the TX Matrix Plus router and T1600 or T4000 Routing Engines, a change in Routing Engine mastership can cause one or all T1600 or T4000 routers to be logically disconnected from the TX Matrix Plus router.



**NOTE:** All the master Routing Engines on the routing matrix must use the same Junos OS version. For information about hardware and software requirements, see the *TX Matrix Plus Router Hardware Guide*.

## TX Matrix Plus Router Software Upgrades and Reinstallation

By default, when you upgrade or reinstall software on the TX Matrix Plus router, the new software image is distributed to the connected routers.

## TX Matrix Plus Router Rebooting Process

When you reboot the master Routing Engine of TX Matrix Plus router, all the master Routing Engines in the connected routers reboot. In addition, you can selectively reboot the master Routing Engine or any of the connected routers.

## TX Matrix Plus Router Routing Engine Rebooting Sequence

The Routing Engines on the TX Matrix Plus router and T1600 or T4000 routers in the routing matrix boot from the storage media in this order: the USB device (if present), the Compact Flash card (if present), the disk (if present) in slot 1, and then the LAN.

## TX Matrix Plus Router Management Ethernet Interfaces

The management Ethernet interface used for the TX Matrix Plus router and the T1600 or T4000 routers in a routing matrix is **em0**. This interface provides an out-of-band method for connecting to the routers in the routing matrix. The Junos OS automatically creates the router's management Ethernet interface, em0. To use **em0** as a management port, you must configure its logical port, **em0.0**, with a valid IP address.

**NOTE:**

- The Routing Engines in the TX Matrix Plus router and in the T1600 or T4000 routers configured in a routing matrix do not support the management Ethernet interface `fxp0` or the internal Ethernet interfaces `fxp1` or `fxp2`.
- Automated scripts that have been developed for standalone routers (T1600 routers not configured in a routing matrix) might contain references to the `fxp0`, `fxp1`, or `fxp2` interfaces. Before reusing the scripts on T1600 routers in a routing matrix, edit any command lines that reference the T1600 router management Ethernet interface `fxp0` by replacing “`fxp0`” with “`em0`”.

## TX Matrix Plus Router Internal Ethernet Interfaces

On a TX Matrix Plus router, the Routing Engine (RE-TXP-SFC) and Control Board (TXP-CB) function as a unit, or a host subsystem. For each host subsystem in the router, Junos OS automatically creates two internal Ethernet interfaces, `ixgbe0` and `ixgbe1`, for the two 10-Gigabit Ethernet ports on the Routing Engine.

## Routing Matrix-Based T1600 or T4000 Router Internal Ethernet Interfaces

On a T1600 or a T4000 router configured in a routing matrix, the Routing Engine (RE-TXP-LCC) and Control Board (LCC-CB) function as a unit, or a host subsystem. For each host subsystem in the router, Junos OS automatically creates two internal Ethernet interfaces, `bcm0` and `em1`, for the two Gigabit Ethernet ports on the Routing Engine.

For more information about the management Ethernet interface and internal Ethernet interfaces on a TX Matrix Plus router and T1600 or T4000 LCCs configured in a routing matrix, see *Junos OS Network Interfaces Library for Routing Devices*.

## Committing Configurations on the TX Matrix Plus Router

In a routing matrix composed of a TX Matrix Plus router and T1600 or T4000 routers, all configuration must be performed on the TX Matrix Plus router. Any configuration you commit on a T1600 or a T4000 router is not propagated to the TX Matrix Plus router or other T1600 or T4000 routers. Only configuration changes you commit on the TX Matrix Plus router are propagated to all routers. A commit operation on the a TX Matrix Plus router overrides any changes you commit on a T1600 or a T4000 router.

If you issue the **commit** command, you commit the configuration to all the master Routing Engines in the routing matrix.

```
user@host# commit
sfc-re0:
configuration check succeeds
lcc0-re0:
commit complete
lcc1-re0:
commit complete
sfc-re0:
commit complete
```



**NOTE:** If a commit operation fails on any node, then the commit operation is not completed for the entire routing matrix.

If you issue the **commit synchronize** command on the TX Matrix Plus router, you commit the configuration to all the master and backup Routing Engines in the routing matrix.

```
user@host# commit synchronize
sfc-re0:
configuration check succeeds
lcc0-re1:
commit complete
lcc0-re0:
commit complete
lcc1-re1:
commit complete
lcc1-re0:
commit complete
sfc-re1:
commit complete
sfc-re0:
commit complete
```

## Routing Matrix Configuration Groups

For routers that include two Routing Engines, you can specify two special group names—**re0** and **re1**. These two special group names apply to the Routing Engines in slots 0 and 1 of the TX Matrix Plus router. In addition, the routing matrix supports group names for the Routing Engines for each T1600 or T4000 router: **lcc n-re0** and **lcc n-re1**. *n* identifies a T1600 or T4000 router depending on the LCC configuration.

## Routing Matrix System Log Messages

You configure the T1600 or T4000 routers to forward their system log messages to the TX Matrix Plus router at the **[edit system syslog host sfc0-master]** hierarchy level. For information about how to configure system log messages on a routing matrix based on a TX Matrix Plus router and T1600 or T4000 LCCs, see *Configuring System Logging for a TX Matrix Plus Router*.

### Related Documentation

- [Using the Junos OS to Configure a T1600 or T4000 Router Within a Routing Matrix on page 405](#)
- [TX Matrix Plus Router Chassis and Interface Names on page 402](#)
- [Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 407](#)
- [Overview of a Routing Matrix with a TX Matrix Plus Router](#)

## TX Matrix Plus Router Chassis and Interface Names

---

The output from some CLI commands uses the terms SFC and **sfc** (for *switch-fabric chassis*) to refer to the TX Matrix Plus router. Similarly the terms LCC, and **lcc** as a prefix (for *line-card chassis*) refer to a T1600 or T4000 router in a routing matrix composed of a TX Matrix Plus router and T1600 or T4000 routers.

T1600 routers are assigned LCC index numbers, 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix. T1600 routers are assigned LCC index numbers, 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix. The current supported configuration of the routing matrix, can have up to eight T1600 routers, and each T1600 router has up to eight FPCs. Therefore, the routing matrix can have up to 64 FPCs (0 through 63). The FPCs are configured at the **[edit chassis lcc number]** hierarchy level.

In the Junos OS CLI, an interface name has the following format:

```
type-fpc/pic/port
```

When you specify the FPC number, the Junos OS determines which T1600 router contains the specified FPC based on the following assignment:

- On LCC 0, FPC hardware slots 0 through 7 correspond to FPC software numbers 0 through 7.
- On LCC 1, FPC hardware slots 0 through 7 correspond to FPC software numbers 8 through 15.
- On LCC 2, FPC hardware slots 0 through 7 correspond to FPC software numbers 16 through 23.
- On LCC 3, FPC hardware slots 0 through 7 correspond to FPC software numbers 24 through 31.
- On LCC 4, FPC hardware slots 0 through 7 correspond to FPC software numbers 32 through 39.
- On LCC 5, FPC hardware slots 0 through 7 correspond to FPC software numbers 40 through 47.
- On LCC 6, FPC hardware slots 0 through 7 correspond to FPC software numbers 48 through 55.
- On LCC 7, FPC hardware slots 0 through 7 correspond to FPC software numbers 56 through 63.

To convert FPC numbers in the T1600 routers to the correct FPC in a routing matrix, use the conversion chart shown in [Table 64 on page 403](#). You can use the converted FPC number to configure the interfaces on the TX Matrix Plus router in your routing matrix.

Table 64: T1600 Router to Routing Matrix FPC Conversion Chart

FPC Numbering	T1600 Routers							
	LCC 0							
T1600 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	0	1	2	3	4	5	6	7
	LCC 1							
T1600 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	8	9	10	11	12	13	14	15
	LCC 2							
T1600 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	16	17	18	19	20	21	22	23
	LCC 3							
T1600 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	24	25	26	27	28	29	30	31
	LCC 4							
T1600 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	32	33	34	35	36	37	38	39
	LCC 5							
T1600 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	40	41	42	43	44	45	46	47
	LCC 6							
T1600 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	48	49	50	51	52	53	54	55
	LCC 7							
T1600 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	56	57	58	59	60	61	62	63

For example, in a routing matrix that contains **lcc 0** through **lcc 2**, **so-20/0/1** refers to FPC slot 4 of **lcc 2**.

T4000 routers are assigned LCC index numbers, 0, 2, 4, and 6 when T4000 routers are connected to a TX Matrix Plus router in a routing matrix. The current supported configuration of the routing matrix, can have up to four T4000 routers, and each T4000 router has up to eight FPCs. Therefore, the routing matrix can have up to 32 FPCs (0 through 63). The odd numbered LCCs and the FPC slots of these LCCs are unused, when T4000 routers are connected to TX Matrix Plus router in a routing matrix. The FPCs are configured at the **[edit chassis lcc number]** hierarchy level.

In the Junos OS CLI, an interface name has the following format:

```
type-fpc/pic/port
```

When you specify the FPC number, the Junos OS determines which T4000 router contains the specified FPC based on the following assignment:

- On LCC 0, FPC hardware slots 0 through 7 correspond to FPC software numbers 0 through 7.
- On LCC 2, FPC hardware slots 0 through 7 correspond to FPC software numbers 16 through 23.
- On LCC 4, FPC hardware slots 0 through 7 correspond to FPC software numbers 32 through 39.
- On LCC 6, FPC hardware slots 0 through 7 correspond to FPC software numbers 48 through 55.

To convert FPC numbers in the T4000 routers to the correct FPC in a routing matrix, use the conversion chart shown in [Table 65 on page 404](#). You can use the converted FPC number to configure the interfaces on the TX Matrix Plus router in your routing matrix.

**Table 65: T4000 Router to Routing Matrix FPC Conversion Chart**

FPC Numbering	T4000 Routers							
LCC 0								
T4000 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	0	1	2	3	4	5	6	7
LCC 2								
T4000 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	16	17	18	19	20	21	22	23
LCC 4								

Table 65: T4000 Router to Routing Matrix FPC Conversion Chart (continued)

FPC Numbering	T4000 Routers							
T4000 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	32	33	34	35	36	37	38	39
LCC 6								
T4000 Router FPC Slots	0	1	2	3	4	5	6	7
Routing Matrix FPC Slots Equivalent	48	49	50	51	52	53	54	55

**Related Documentation**

- [TX Matrix Plus Router Configuration Overview on page 397](#)
- [Using the Junos OS to Configure a T1600 or T4000 Router Within a Routing Matrix on page 405](#)
- [Configuring Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 or T4000 Router Stays Offline on page 406](#)

## Using the Junos OS to Configure a T1600 or T4000 Router Within a Routing Matrix

A routing matrix composed of a TX Matrix Plus router and T1600 or T4000 routers supports the same chassis configuration statements as a standalone router (except **ce1**, **ct3**, **mlfr-uni-nni-bundles**, **sparse-dlcis**, and **vtmapping**). By including the **lcc** statement at the **[edit chassis]** hierarchy level, you configure PIC-specific features, such as framing, on specific T1600 or T4000 routers. In addition, a TX Matrix Plus router has two more chassis configuration statements, **online-expected** and **offline**.

To configure a T1600 router that is connected to a TX Matrix Plus router, include the **lcc** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
lcc number;
```

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

To configure a T1600 or T4000 router within a routing matrix, include the following statements at the **[edit chassis lcc number]** hierarchy level:

```
[edit chassis lcc number]
fpc slot-number { # Use the hardware FPC slot number
pic pic-number {
  atm-cell-relay-accumulation;
  atm-l2circuit-mode (cell | aal5 | trunk trunk);
  framing (sdh | sonet);
  idle-cell-format {
    itu-t;
    payload-pattern payload-pattern-byte;
  }
  max-queues-per-interface (8 | 4);
  no-concatenate;
}
offline;
online-expected;
q-pic-large-buffer {
  large-scale;
}
```



**NOTE:** For the FPC slot number, specify the actual hardware slot number (numbered 0 through 7) as labeled on the T1600 or T4000 router chassis. Do not use the corresponding software FPC number shown in the [“TX Matrix Plus Router Chassis and Interface Names”](#) on page 402.

For information about how to configure the **online-expected** and **offline** configuration statements, see [“Configuring Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 or T4000 Router Stays Offline”](#) on page 406.

#### Related Documentation

- [TX Matrix Plus Router Configuration Overview](#) on page 397
- [TX Matrix Plus Router Chassis and Interface Names](#) on page 402
- [Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform](#) on page 407

## Configuring Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 or T4000 Router Stays Offline

By default, the Junos OS enables all the T1600 or T4000 routers in the routing matrix to come online. The Junos OS also enables you to configure all the T1600 or T4000 routers so that if they do not come online, an alarm is sent by the TX Matrix Plus router.

To configure this alarm, include the **online-expected** statement at the **[edit chassis lcc number]** hierarchy level:

```
[edit chassis lcc number]
online-expected;
```

If you do not want a T1600 or T4000 router to be part of the routing matrix, you can configure it to be offline. This is useful when you are performing maintenance on a T1600



or T4000 router. When the T1600 or T4000 router is ready to come back online, delete the **offline** configuration statement.

To configure a T1600 or T4000 router so that it is offline, include the **offline** statement at the `[edit chassis lcc number]` hierarchy level:

```
[edit chassis lcc number]  
offline;
```



**NOTE:** If you do not configure the **online-expected** or **offline** statement, any T1600 or T4000 router that is part of the routing matrix is allowed to come online. However, if a T1600 or T4000 router does not come online, the TX Matrix Plus router does not generate an alarm.

#### Related Documentation

- [TX Matrix Plus Router Configuration Overview on page 397](#)
- [Using the Junos OS to Configure a T1600 or T4000 Router Within a Routing Matrix on page 405](#)
- [Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 407](#)

## Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform

This topic provides an overview of the T1600 router configuration in order to upgrade it to the LCC0 of a newly configured TX Matrix Plus router. The routing matrix with TX Matrix Plus router consists of one TX Matrix Plus router that acts as the switch-fabric chassis (SFC) and from one to four T1600 routers that act as the line-card chassis (LCC). To perform the in-service upgrade, manually upgrade the Switch Interface Boards (SIBs), Control Boards (CBs) and Routing Engines of the T1600 router, and connect the upgraded T1600 router to the corresponding components of the TX Matrix Plus router with fiber-optic cables. When the SIBs of the T1600 router are upgraded and the data plane connection between the SFC and LCC is set up, the traffic flows in and out of the TX Matrix Plus routing platform through the data plane. When you upgrade the Routing Engines and CBs, the control plane connectivity between the SFC and LCC is set up. For information about the hardware and the installation requirements, see the *TX Matrix Plus Router Hardware Guide*.

This section discusses the following procedures to upgrade a standalone T1600 router to the LCC0 of a TX Matrix Plus routing platform:

- [Preparing the Configuration File and Upgrading Junos OS on the T1600 Router and SFC on page 408](#)
- [Configuring Junos OS for Upgrading SIBs on the T1600 Router and Connecting It to the SFC on page 408](#)

- [Upgrading CBs and Routing Engines of the T1600 Router for Control Plane Connectivity on page 410](#)
- [Changing the Management Ethernet Interface Name for the T1600 Router on page 410](#)
- [Transferring Control of the T1600 Router \(LCC0\) to the SFC on page 410](#)
- [Adding a New T1600 Router to the TX Matrix Plus Routing Platform on page 411](#)
- [Downgrading a T1600 Router from the LCC of a TX Matrix Routing Platform to a Standalone T1600 Router on page 411](#)

## Preparing the Configuration File and Upgrading Junos OS on the T1600 Router and SFC

To prepare the configuration file and upgrade the Junos OS, follow these steps:

1. Save and archive a copy of the active configuration of the T1600 router.
2. Update the active configuration to make it applicable to the LCC.
3. Transfer the file configuration to the SFC (to be applied later).
4. Upgrade the T1600 router and SFC with Junos OS Release 10.1 or later, and reboot.

## Configuring Junos OS for Upgrading SIBs on the T1600 Router and Connecting It to the SFC

Upgrade the Control Boards (CBs) and Routing Engines of the T1600 router by replacing the T-CBs with LCC-CBs and RE 2000 with LCC-RE. To configure the T1600 router to support a SIB upgrade and connect it to the SFC, follow these steps:

1. Issue the **fabric upgrade-mode** CLI command at the **[edit chassis]** hierarchy level and commit the changes to update the configuration. This change in the configuration enables the T1600 chassis to be upgraded with the TXP-T1600 SIBs.

```
[edit]
user@host# set chassis fabric upgrade-mode
user@host# commit
```

You must also modify the configuration of the SFC by including **fabric upgrade-mode** statement at the **[edit chassis]** hierarchy level and commit the configuration on the SFC.

2. Take the backup SIB-I-T1600 offline by issuing the **request chassis sib slot slot-number offline** command.

```
user@host> request chassis sib slot 0 offline
```

3. Replace the offline SIB-I-T1600 with SIB-TXP-T1600.
4. Bring the replaced SIB-TXP-T1600 online, by issuing the **request chassis sib slot slot-number online** command.

```
user@host> request chassis sib slot 0 online
```

The T1600 router automatically updates the links between the replaced SIB-TXP-T1600 and the Flexible PIC Concentrators (FPCs).

5. Establish the data plane connectivity by connecting the SIB-TXP-T1600 on the T1600 router to the ABS-SIB-F13 on the SFC with fiber-optic cables and configuring both routers (T1600 and SFC) for transmitting and receiving traffic on the TX Matrix Plus routing platform. Use the following CLI commands, to manually update the link between the T1600 router and SFC before the data plane is activated:
  - To configure the SFC to receive traffic from the T1600 router, issue the **request chassis sib f13 train-link-receive slot *SFC-SIB-F13-slot-num*** command.  
*SFC-SIB-F13-slot-num* is the slot in the SFC chassis where the ABS-SIB-F13 must be manually connected to SIB-TXP-T1600 in a slot (from 0 through 4) on the T1600 router. You can configure this for a value of 0, 3, 6, 8, or 11.
  - To configure the T1600 router to receive traffic from the SFC, issue the **request chassis sib train-link-receive slot *LCC-SIB-ST-SIB-L-slot-num*** command.  
*LCC-SIB-ST-SIB-L-slot-num* is the slot in the T1600 router chassis where SIB-TXP-T1600 must be manually connected to ABS-SIB-F13 in a slot (0, 3, 6, 8 or 11) on the SFC. You can configure this to be a value in the range from 0 through 4.
  - To configure the SFC to transmit traffic to the T1600 router, issue the **request chassis sib f13 train-link-transmit slot *SFC-SIB-F13-slot-num*** command.  
*SFC-SIB-F13-slot-num* is the slot in the SFC chassis where the ABS-SIB-F13 must be manually connected to SIB-TXP-T1600 in a slot (from 0 through 4) on the T1600 router. You can configure this for a value of 0, 3, 6, 8, or 11.
  - To configure the T1600 router to transmit traffic to the SFC, issue the **request chassis sib train-link-transmit slot *LCC-SIB-ST-SIB-L-slot-num*** command.  
*LCC-SIB-ST-SIB-L-slot-num* is the slot in the T1600 router chassis where SIB-TXP-T1600 must be manually connected to ABS-SIB-F13 in a slot (0, 3, 6, 8 or 11) on the SFC. You can configure this to be a value in the range from 0 through 4.
6. Using the SIB LEDs, manually verify the link between the T1600 router and the SFC. The FPCs will send traffic using the SIB-TXP-T1600 and ABS-SIB-F13.
7. Repeat Steps 2 through 4 for all the SIB-I-T1600s.
8. When all the SIBs are upgraded, delete the fabric upgrade-mode statement from the configuration hierarchy, and commit the changes on both the T1600 router and the SFC.

```
[edit chassis]
user@host# delete chassis fabric upgrade-mode
user@host# commit
```



**WARNING:** You must upgrade the CBs and the Routing Engines of the T1600 router before you upgrade the SIBs.

## Upgrading CBs and Routing Engines of the T1600 Router for Control Plane Connectivity

The CBs and the Routing Engines of the T1600 router are upgraded by replacing the T-CBs with LCC-CBs and RE-2000 with LCC-RE. To establish the control plane connectivity, connect the Ethernet cables from the T1600 router to the SFC. For more information about hardware requirements, see the *TX Matrix Plus Router Hardware Guide*.

## Changing the Management Ethernet Interface Name for the T1600 Router

The Junos OS automatically configures management Ethernet interfaces for both the master and the backup Routing Engines, **fxp0**. However, after you upgrade both Routing Engines (master and backup), you must change the management Ethernet interface name to **em0**.

To change the management Ethernet interface name for the master Routing Engine, include the **interfaces em0** statement at the **[edit groups re0]** hierarchy level.

```
[edit groups re0]
user@host# set interfaces em0
user@host# commit
```



**WARNING:** If you do not change the management Ethernet interface from **fxp0** to **em0** for each upgraded LCC-RE, you cannot access the router remotely through services such as Telnet, SSH, and so on.

## Transferring Control of the T1600 Router (LCC0) to the SFC

To transfer control from a T1600 router to the SFC, follow these steps:

1. Manually set the M/S switch on both replaced CBs of the T1600 router to M (multichassis).
2. Configure the T1600 router as LCC0 by including the **lcc number** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
user@host> set lcc number
```



**NOTE:** When you upgrade the other T1600 routers to LCC, you must set the LCC number from 1 to 3.

3. After you configure the LCC0, reboot it for the changes to take effect. This rebooting process establishes the forwarding state of the new LCC in the TX Matrix Plus routing platform by bringing up the SIBs automatically. For more information on hardware connectivity for the control plane, see the *TX Matrix Plus Router Hardware Guide*.

## Adding a New T1600 Router to the TX Matrix Plus Routing Platform

The in-service upgrade of new operational T1600 routers to LCC1, LCC2, and LCC3 using the Junos OS CLI is not supported. To add a second LCC to the TX Matrix Plus routing platform, follow these steps:

1. Upgrade both the CBs and Routing Engines on the T1600 router. For details, see [“Upgrading CBs and Routing Engines of the T1600 Router for Control Plane Connectivity” on page 410](#).
2. Upgrade the T1600 router with the same version of the Junos OS as on the SFC.
3. Upgrade the SIBs of the T1600 router and connect the new SIBs to the SFC. For details, see [“Configuring Junos OS for Upgrading SIBs on the T1600 Router and Connecting It to the SFC” on page 408](#).
4. Connect Ethernet links of the control plane from the T1600 router to the SFC.
5. Reboot the T1600 router. After rebooting, the router becomes a part of the TX Matrix Plus routing platform and is connected to the SFC on the control plane.

## Downgrading a T1600 Router from the LCC of a TX Matrix Routing Platform to a Standalone T1600 Router

To downgrade any LCC to a standalone T1600 router, follow these steps:

1. Transfer the control to the LCC from the SFC:
  - a. Roll back the configuration of the SFC and LCC to the configuration before the T1600 router was added and commit the configuration. For more information about configuring the T1600 router to LCC, see [“Preparing the Configuration File and Upgrading Junos OS on the T1600 Router and SFC” on page 408](#).
  - b. Manually set the M/S switch to single-chassis on the T1600 router on both CBs.
  - c. Reboot both the master and backup Routing Engines on the T1600.
2. Downgrade the SIBs of the LCC and remove the data plane connections:
  - a. Take the spare SIB-TXP-T1600 on the LCC offline by issuing the **request chassis sib slot *slot-number* offline** command.
 

```
user@host> request chassis sib slot 0 offline
```
  - b. Remove the data plane connections from the SIB-TXP-T1600 to the SFC.
  - c. Replace the SIB-TXP-T1600 with SIB-I-T1600 and bring it online.
  - d. Repeat these steps for all SIB-TXP-T1600s.
3. Remove the control plane connectivity by disconnecting the Ethernet cables of the control plane from the T1600 router to the SFC.

The LCC becomes a standalone T1600 router out of the TX Matrix Plus routing platform.

- See Also**
- [TX Matrix Plus Router Configuration Overview on page 397](#)
  - [Using the Junos OS to Configure a T1600 or T4000 Router Within a Routing Matrix on page 405](#)
  - [TX Matrix Plus Router Chassis and Interface Names on page 402](#)
  - [Configuring Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 or T4000 Router Stays Offline on page 406](#)

## Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs

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This topic describes how to configure Junos OS when you upgrade a T1600 router to LCC 0 of a TX Matrix Plus router with 3D SIBs. A routing matrix with a TX Matrix Plus router consists of one TX Matrix Plus router that acts as the switch-fabric chassis (SFC) and up to eight T1600 routers, or up to four T4000 routers, or a mix of T1600 and T4000 routers that act as the line-card chassis (LCCs). To perform the in-service upgrade, manually upgrade the Switch Interface Boards (SIBs), Control Boards (CBs), and Routing Engines of the T1600 router, and connect the upgraded T1600 router to the corresponding components of the TX Matrix Plus router with fiber-optic cables. When the SIBs of the T1600 router are upgraded and the data plane connection between the SFC and LCC is set up, the traffic flows in and out of the TX Matrix Plus router through the data plane. For information about the hardware and the installation requirements, see the [TX Matrix Plus Hardware Guide](#).

This topic discusses the following procedures to upgrade a standalone T1600 router to LCC 0 of a TX Matrix Plus routing matrix and to configure Junos OS on the LCC and the SFC for the upgrade. The Junos OS configuration includes setting the LCC mode and training and verifying the links between the LCC and the SFC.



**NOTE:**

- The upgraded LCC becomes LCC 0.
  - In-service upgrade for a standalone LCC applies only for the first standalone LCC becoming part of the routing matrix.
  - No other LCC must be already connected to the SFC.
- 
- [Preparing the Configuration File and Upgrading Junos OS on the T1600 Router and the SFC on page 413](#)
  - [Configuring Junos OS for Upgrading the SIBs on the T1600 Router and Connecting It to the SFC on page 413](#)
  - [Transferring Control of the T1600 Router \(LCC 0\) to the SFC on page 418](#)
  - [Adding a New T1600 Router to the TX Matrix Plus Routing Matrix on page 419](#)

## Preparing the Configuration File and Upgrading Junos OS on the T1600 Router and the SFC

To prepare the configuration file and upgrade the Junos OS:

1. Save and archive a copy of the active configuration of Junos OS on the T1600 router.
2. Update the active configuration to make it applicable to the LCC 0.
3. Transfer the modified configuration file that you have prepared to an intermediate server on the out-of-band management network accessible by the standalone router and the TX Matrix Plus router.
4. Transfer the configuration file to the SFC (to be applied later).
5. Upgrade the T1600 router with Junos OS Release 13.2 or later, and reboot.
6. Upgrade the SFC with Junos OS Release 13.2 or later, and reboot.

## Configuring Junos OS for Upgrading the SIBs on the T1600 Router and Connecting It to the SFC

To upgrade and integrate a T1600 router to LCC 0 of the routing matrix with 3D SIBs perform the following tasks:

- [Upgrading the Control Boards, Routing Engines, PEMs, and Rear Fan Tray of the T1600 Router for Control Plane Connectivity on page 413](#)
- [Preparing the SFC and the LCC for the Upgrade on page 413](#)
- [Upgrading the SIBs on page 415](#)
- [Training the Switching Plane Links on page 416](#)
- [Activating and Verifying the Switching Planes on page 417](#)

### Upgrading the Control Boards, Routing Engines, PEMs, and Rear Fan Tray of the T1600 Router for Control Plane Connectivity

---

For control plane connectivity, upgrade the Control Boards (CBs), and Routing Engines of the T1600 router by replacing the T-CBs with LCC-CBs, and RE 2000 with LCC-RE. Replace the power entry module (PEM) with PWR-T-6-60-DC-BB and the rear fan tray with FAN-R-TXP-3D-LCC. See the [TX Matrix Plus Hardware Guide](#) for the installation procedures.

### Preparing the SFC and the LCC for the Upgrade

---

To prepare the SFC and the LCC for the upgrade:

1. Use the **show pfe statistics traffic** command to verify that the level of traffic on each Packet Forwarding Engine in the LCC is within the recommended range for upgrade (which is approximately 50% of line rate).
2. Use the **show chassis fabric plane** command to verify that four planes are active and one plane is spare.

```
user@host> show chassis fabric plane
```

```

Plane State Uptime
0 Online 15 hours, 42 minutes, 9 seconds
1 Online 15 hours, 42 minutes, 9 seconds
2 Spare
3 Online 15 hours, 42 minutes, 9 seconds
4 Online 15 hours, 42 minutes, 9 seconds

```

3. a. Ensure that the **CONFIG-SIZE** dial on the SFC is set to **3** and all the SIBs are online before configuring the **upgrade-mode** statement.
- b. Configure the upgrade mode on the LCC by using the **fabric upgrade-mode 3d-fabric** statement at the **[edit chassis]** hierarchy level and commit the changes. This configuration enables the T1600 chassis to be upgraded with the TXP-3D-LCC SIBs.

```

[edit chassis]
user@host# set fabric upgrade-mode 3d-fabric
user@host# commit

```

This step also checks for the compatibility of Routing Engines, CBs, and FPCs.



#### NOTE:

The following FPCs are not supported:

- T640-FPC1-E and T640-FPC1-E2
- T640-FPC2, T640-FPC2-E, and T640-FPC2-E2
- T640-FPC3, T640-FPC3-E, and T640-FPC3-E2
- T640-FPC4-1P-ES

- c. Configure the upgrade mode on the SFC by including the **fabric upgrade-mode 3d-fabric** statement at the **[edit chassis]** hierarchy level and commit the configuration on the SFC.

```

[edit chassis]
user@host# set fabric upgrade-mode 3d-fabric
user@host# commit

```

4. Set the LCC mode on the SFC's master Routing Engine to **t1600**:

```

[edit chassis]
user@host# set lcc-mode lcc 0 mode t1600
user@host# commit

```

Confirm that the output of **show chassis hardware** on LCC indicates that the chassis is T1600.



## Upgrading the SIBs

You must upgrade the existing SIBs on the LCC to 3D SIBs for the LCC to operate as LCC 0 in the routing matrix of the TX Matrix Plus router with 3D SIBs. To upgrade the SIBs on the LCC follow these steps:

1. Verify that the same planes are spare on the SFC and the LCC by using the **show chassis fabric plane** command. If the same planes are not **spare**, use the **request chassis fabric plane** command to change the states of the required planes.

The output of **show chassis fabric plane** command must show four active planes on the SFC and the LCC. Spare plane numbers must be identical on the SFC and the LCC.

2. Take the spare SIB-I-T1600 offline by issuing the **request chassis sib slot *slot-number* offline** command.
3. Replace the offline SIB-I-T1600 on the T1600 with SIB-TXP-3D-LCC. See [Replacing the SIB](#) for the replacement procedure.
4. Connect the SIBs on the LCC to the SIBs on the SFC by using fiber-optic cables. See [Connecting the Switching Plane Cables](#) for the connection procedure.
5. Bring the replaced SIB-TXP-3D-LCC online by issuing the **request chassis sib slot *slot-number* online** command.

For example, for plane 0:

```
user@host> request chassis sib slot 0 online
```

6. Issue the **show chassis fabric optics** command to verify that all the cables are in **CABLE\_CONNECTED** state on the SFC and the LCC.

```
user@host> show chassis fabric optics
```

Port	Cable state	Module Type
lcc0-sib0:		
0	CABLE_CONNECTED	AOC
1	CABLE_CONNECTED	AOC
2	CABLE_CONNECTED	AOC
3	CABLE_CONNECTED	AOC
4	CABLE_CONNECTED	AOC
5	CABLE_CONNECTED	AOC
6	CABLE_CONNECTED	AOC
7	CABLE_CONNECTED	CXP Module
lcc0-sib1:		
0	CABLE_CONNECTED	CXP Module
1	CABLE_NOT_CONNECTED	AOC
2	CABLE_CONNECTED	AOC
...		

Until all mandatory cables show the **CABLE\_CONNECTED** state, do not proceed to the next step.



**NOTE:** In a T1600 LCC, the mandatory cables 0, 2, 4, and 6 must be in the **CABLE\_CONNECTED** state.

7. Verify that the newly inserted SIB is in **Spare** state and there are no alarms due to faulty hardware by using the **show chassis sibs** and **show chassis alarms** commands. Until the SIB shows the **Spare** state, and there are no alarms, do not proceed to train the switching plane links.

### Training the Switching Plane Links

For the SIBs on the LCC and the SFC to communicate with each other, the links are trained using the **train-link-transmit** and **train-link-receive** commands on the LCC and the SFC. After the links are trained, they are verified using the **show chassis fabric optical-links**, **show chassis fabric plane extensive**, and **show chassis fabric topology** commands.

To manually train the link between the LCC and the SFC before the data plane is activated, perform the following steps:

1. For the SFC to receive traffic from the LCC, issue the **request chassis sib f13 slot f13 slot train-link-receive** command.

**f13 slot** is the slot in the SFC where the SIB-TXP-F13-3D must be manually connected to SIB-TXP-3D-LCC in a slot (from 0 through 4) in the LCC. The SFC's **f13 slot** has a value of 0, 3, 6, 8, or 11.

SIB Slots on the LCC	SIB Slots on the SFC
0	0
1	3
2	6
3	8
4	11

2. To train the links on the LCC to receive traffic from the SFC, issue the **request chassis sib slot sibSlot train-link-receive** command.

**sibSlot** is the slot in the LCC where SIB-TXP-3D-LCC must be manually connected to SIB-TXP-F13-3D in a slot (0, 3, 6, 8, or 11) on the SFC. You can configure the LCC's **sibSlot** to be a value in the range from 0 through 4.

3. To train the links on the SFC to transmit traffic to the LCC, issue the **request chassis sib f13 slot *f13 slot* train-link-transmit** command.

***f13 slot*** is the slot in the SFC where the SIB-TXP-F13-3D must be manually connected to SIB-TXP-3D-LCC in a slot (from 0 through 4) in the T1600 router. ***f13 slot*** has a value of 0, 3, 6, 8, or 11.

4. To train the links on the LCC to transmit traffic to the SFC, issue the **request chassis sib slot *sibSlot* train-link-transmit** command.

***sibSlot*** is the slot in the LCC where SIB-TXP-3D-LCC must be manually connected to SIB-TXP-F13-3D in a slot (0, 3, 6, 8, or 11) in the SFC. You can configure ***sibSlot*** to be a value in the range from 0 through 4.

5. Verify the links between the LCC and the SFC by using the following commands:

- **show chassis fabric optical-links**
- **show chassis fabric plane extensive**
- **show chassis fabric topology**

6. If errors occur at this stage, take the SIB on the LCC offline and bring it back online. On the SFC, take the F13 SIB offline and bring it back online. Start training the links again.

### Activating and Verifying the Switching Planes

To activate and verify the upgraded switching plane:

1. To activate the switching plane with the new SIB, take another switching plane offline:

On the SFC, issue the **request chassis fabric plane *plane-num* offline sfc 0** command.

On the LCC, issue the **request chassis sib slot *sibSlot* offline** command.

For example, on the SFC:

```
user@host# request chassis fabric plane 1 offline sfc 0
```

On the LCC:

```
user@host# request chassis sib slot 1 offline
```

2. Use the **show chassis fabric stats rates summary** command on the LCC and **show chassis fabric stats f13 actPlaneSib1# rates summary** command on the SFC to verify that the traffic is flowing through all the planes in the LCC and the SFC, respectively.

If traffic is flowing smoothly, the statistics for **Data/sec** under **Received** and **Sent** shows a nonzero number.

3. Follow the procedures in [“Upgrading the SIBs” on page 415](#), [“Training the Switching Plane Links” on page 416](#), and [“Activating and Verifying the Switching Planes” on page 417](#) for all the T1600 SIBs in the other planes.

**Related Documentation**

- [Preparing the SFC and the LCC for the Upgrade on page 413](#)
- [Upgrading the SIBs on page 415](#)
- [Training the Switching Plane Links on page 416](#)
- [Activating and Verifying the Switching Planes on page 417](#)

## Transferring Control of the T1600 Router (LCC 0) to the SFC

After upgrading the SIBs of a standalone T1600 router and integrating it into a routing matrix, transfer the control of the T1600 router to the SFC in the routing matrix:

1. On the SFC, confirm that the dial on the left, **CHASSIS ID**, displays **00**, and that on right, **CONFIG-SIZE**, displays **03**.
2. Connect the Ethernet links from the T1600 CBs to the connector interface panel (CIP) on the SFC. Verify that the Ethernet connection LED is lit on the CIP.
3. Manually set the **M/S** switch on both the replaced CBs of the T1600 router to **M** (multichassis).
4. Configure the T1600 router as LCC 0 by including the **lcc number** statement at the **[edit chassis]** hierarchy level.

```
[edit chassis]
user@host>set lcc number
```

5. When all the SIBs are upgraded, delete the **fabric upgrade-mode** statement from the configuration hierarchy, and commit the changes on both the LCC and the SFC.

```
[edit chassis]
user@host# delete chassis fabric upgrade-mode 3d-fabric
user@host# commit
```

6. After you configure LCC 0, reboot it for the changes to take effect. Reboot the SFC also. This rebooting process establishes the forwarding state of the new LCC in the TX Matrix Plus routing matrix by bringing up the SIBs automatically. For more information about hardware connectivity for the control plane, see the [TX Matrix Plus Hardware Guide](#).

## Adding a New T1600 Router to the TX Matrix Plus Routing Matrix

Junos OS does not support the in-service upgrade of T1600 routers to LCC 1 though LCC 7. To add a second LCC to the TX Matrix Plus routing matrix:

1. Upgrade both the CBs and Routing Engines on the T1600 router. For details, see [“Upgrading CBs and Routing Engines of the T1600 Router for Control Plane Connectivity” on page 410](#).
2. Upgrade the T1600 router with the same version of Junos OS as that on the SFC.
3. Upgrade the SIBs of the T1600 router and connect the new SIBs to the SFC. For details, see [“Configuring Junos OS for Upgrading the SIBs on the T1600 Router and Connecting It to the SFC” on page 413](#).
4. Connect Ethernet links of the control plane from the T1600 router to the SFC.
5. Set the LCC mode on SFC's master Routing Engine to **t1600** by using the following commands:

```
user@host# set chassis lcc-mode lcc 0 mode t1600
user@host# commit
```

6. Reboot the T1600 router. After rebooting, the router becomes part of the TX Matrix Plus routing matrix and is connected to the SFC on the control plane.

- See Also**
- [Configuring Junos OS to Upgrade a T4000 Router to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 419](#)
  - *Upgrading an Operational Standalone Router and Integrating It into a TX Matrix Plus Routing Matrix with 3D SIBs*

## Configuring Junos OS to Upgrade a T4000 Router to LCC 0 of a TX Matrix Plus Router with 3D SIBs

This topic describes how to configure Junos OS when you upgrade a T4000 router to LCC 0 of a TX Matrix Plus router with 3D SIBs. A TX Matrix Plus routing matrix consists of one TX Matrix Plus router that acts as the switch-fabric chassis (SFC) and up to eight T1600 routers, or up to four T4000 routers, or a mix of T1600 and T4000 routers that act as the line-card chassis (LCCs). To perform the in-service upgrade, manually upgrade the Switch Interface Boards (SIBs), Control Boards (CBs), and Routing Engines of the T4000 router, and connect the upgraded T4000 router to the corresponding components of the TX Matrix Plus router with fiber-optic cables. When the SIBs of the T4000 router are upgraded and the data plane connection between the SFC and LCC is set up, the traffic flows in and out of the TX Matrix Plus router through the data plane. For information about the hardware and the installation requirements, see the [TX Matrix Plus Hardware Guide](#).

This topic discusses the following procedures to upgrade a standalone T4000 router to LCC 0 of a TX Matrix Plus routing matrix and to configure Junos OS on the LCC and the

SFC for the upgrade. The Junos OS configuration includes setting the LCC mode and training and verifying the links between the LCC and the SFC.



NOTE:

- The upgraded LCC becomes LCC 0.
  - In-service upgrade for a standalone LCC applies only for the first standalone LCC that becomes part of the routing matrix.
  - No other LCC must be already connected to the SFC.
- 
- [Preparing the Configuration File and Upgrading Junos OS on the T4000 Router and the SFC on page 420](#)
  - [Configuring Junos OS for Upgrading the SIBs on the T4000 Router and Connecting the Router to the SFC on page 420](#)
  - [Transferring Control of the T4000 Router \(LCC 0\) to the SFC on page 425](#)
  - [Adding a New T4000 Router to the TX Matrix Plus Routing Matrix on page 426](#)

## Preparing the Configuration File and Upgrading Junos OS on the T4000 Router and the SFC

To prepare the configuration file and upgrade Junos OS:

1. Save and archive a copy of the active configuration of Junos OS on the T4000 router.
2. Update the active configuration to make it applicable to the LCC 0.
3. Transfer the modified configuration file that you have prepared to an intermediate server on the out-of-band management network accessible by the standalone router and the TX Matrix Plus router.
4. Transfer the configuration file to the SFC (to be applied later).
5. Upgrade the T4000 router with Junos OS Release 13.2 or later, and reboot.
6. Upgrade the SFC with Junos OS Release 13.2 or later, and reboot.

## Configuring Junos OS for Upgrading the SIBs on the T4000 Router and Connecting the Router to the SFC

To upgrade and integrate a T4000 router to LCC 0 of the routing matrix with 3D SIBs, perform the following tasks:

- [Upgrading the Control Boards, Routing Engines, PEMs, and Rear Fan Tray of the T4000 Router for Control Plane Connectivity on page 421](#)
- [Preparing the SFC and the LCC for the Upgrade on page 421](#)
- [Upgrading the SIBs on page 422](#)
- [Training the Switching Plane Links on page 423](#)
- [Activating and Verifying the Switching Plane on page 425](#)

## Upgrading the Control Boards, Routing Engines, PEMs, and Rear Fan Tray of the T4000 Router for Control Plane Connectivity

For control plane connectivity, upgrade the Control Boards (CBs) and Routing Engines of the T4000 router by replacing the T-CBs with LCC-CBs, and RE 2000 with LCC-RE. Replace the power entry module (PEM) with PWR-T-6-60-DC-BB and the rear fan tray with FAN-R-TXP-3D-LCC. See the [TX Matrix Plus Hardware Guide](#) for the installation procedures.

## Preparing the SFC and the LCC for the Upgrade

To prepare the SFC and the LCC for the upgrade:

1. Use the **show pfe statistics traffic** command to verify that the level of traffic on each Packet Forwarding Engine in the LCC is within the recommended range for upgrade (which is approximately 50% of line rate).
2. Use the **show chassis fabric plane** command to verify that four data planes are active and one plane is spare.

```
user@host> show chassis fabric plane

Plane State Uptime
0 Online 15 hours, 42 minutes, 9 seconds
1 Online 15 hours, 42 minutes, 9 seconds
2 Spare
3 Online 15 hours, 42 minutes, 9 seconds
4 Online 15 hours, 42 minutes, 9 seconds
```

3. a. Ensure that the **CONFIG-SIZE** dial on the SFC is set to **3** and all the SIBs are online before configuring the **upgrade-mode** statement.
- b. Configure the upgrade mode on the LCC by using the **fabric upgrade-mode 3d-fabric** statement at the **[edit chassis]** hierarchy level and commit the changes. This configuration enables the T4000 chassis to be upgraded with the TXP-3D-LCC SIBs.

```
[edit chassis]
user@host# set fabric upgrade-mode 3d-fabric
user@host# commit
```

This step also checks for the compatibility of Routing Engines, CBs, and FPCs.



### NOTE:

The following FPCs are not supported:

- T640-FPC1-E and T640-FPC1-E2
- T640-FPC2, T640-FPC2-E, and T640-FPC2-E2
- T640-FPC3, T640-FPC3-E, and T640-FPC3-E2
- T640-FPC4-1P-ES

- c. Configure the upgrade-mode on the SFC by including the **fabric upgrade-mode 3d-fabric** statement at the **[edit chassis]** hierarchy level and commit the configuration on the SFC.

```
[edit chassis]
user@host# set fabric upgrade-mode 3d-fabric
user@host# commit
```

4. Configure the LCC mode on the SFC's master Routing Engine to **t4000**:

```
[edit chassis]
user@host# set lcc-mode lcc 0 mode t4000
user@host# set lcc-mode lcc 1 mode empty
user@host# commit
```



**NOTE:** If you configure **lcc-mode** for LCC 0, LCC 2, LCC 4, and LCC 6 as **t4000**, for the next LCC, **lcc-mode** must be **empty**— that is, **lcc-mode** for LCC 3, LCC 5, and LCC 7 must be **empty**.

### Upgrading the SIBs

You must upgrade the existing SIBs on the LCC to 3D SIBs for the LCC to operate as LCC 0 in the routing matrix of the TX Matrix Plus router with 3D SIBs. To upgrade the SIBs on the LCC:

1. Verify that the same planes are spare on the SFC and the LCC by using the **show chassis fabric plane** command. If the same planes are not spare, use the **request chassis fabric plane** command to change the states of the required planes.  
  
The output of **show chassis fabric plane** command must show four active planes on the SFC and the LCC. Spare plane numbers must be identical on the SFC and the LCC.
2. Take the spare SIB-I-T4000 offline by issuing the **request chassis sib slot slot-number offline** command.
3. Replace the offline SIB-I-T4000 with SIB-TXP-3D-LCC. See the [Replacing the SIB](#) for the replacement procedure.
4. Connect the SIBs on the LCC to the SIBs on the SFC by using fiber-optic cables. See the [Connecting the Switching Plane Cables](#) for the connection procedure.
5. Bring the replaced SIB-TXP-3D-LCC online by issuing the **request chassis sib slot slot-number online** command.

For example, for plane 0:

```
user@host> request chassis sib slot 0 online
```



- Issue the **show chassis fabric optics** command to verify that all the cables are in **CABLE\_CONNECTED** state on the SFC and the LCC.

```
user@host> show chassis fabric optics
```

Port	Cable state	Module Type
lcc0-sib0:		
0	CABLE_CONNECTED	AOC
1	CABLE_CONNECTED	AOC
2	CABLE_CONNECTED	AOC
3	CABLE_CONNECTED	AOC
4	CABLE_CONNECTED	AOC
5	CABLE_CONNECTED	AOC
6	CABLE_CONNECTED	AOC
7	CABLE_CONNECTED	CXP Module
lcc0-sib1:		
0	CABLE_CONNECTED	CXP Module
1	CABLE_NOT_CONNECTED	AOC
2	CABLE_CONNECTED	AOC
...		

Until all mandatory cables show the **CABLE\_CONNECTED** state, do not proceed to the next step.



**NOTE:** All the eight cables (0 through 7) on a SIB in the T4000 LCC 0 must be in **CABLE\_CONNECTED** state.

- Verify that the newly inserted SIB is in **Spare** state and there are no alarms due to faulty hardware by using the **show chassis sibs** and **show chassis alarms** commands. Until the SIB shows the **Spare** state, and there are no alarms, do not proceed to train the switching plane links.

### Training the Switching Plane Links

For the SIBs on the LCC and the SFC to communicate with each other, the links are trained using the **train-link-transmit** and **train-link-receive** commands on the LCC and the SFC. After the links are trained, they are verified using the **show chassis fabric optical-links**, **show chassis fabric plane extensive**, and **show chassis fabric topology** commands.

To manually train the link between the LCC and the SFC before the data plane is activated, perform these steps:

1. For the SFC to receive traffic from the LCC, issue the **request chassis sib f13 slot f13 slot train-link-receive** command.

**f13 slot** is the slot in the SFC where the SIB-TXP-F13-3D must be manually connected to SIB-TXP-3D-LCC in a slot (from 0 through 4) in the LCC. The SFC's **f13 slot** has a value of 0, 3, 6, 8, or 11.

SIB Slots on the LCC	SIB Slots on the SFC
0	0
1	3
2	6
3	8
4	11

2. To train the links on the LCC to receive traffic from the SFC, issue the **request chassis sib slot sibSlot train-link-receive** command.

**sibSlot** is the slot in the LCC where SIB-TXP-3D-LCC must be manually connected to SIB-TXP-F13-3D in a slot (0, 3, 6, 8, or 11) in the SFC. You can configure the LCC's **sibSlot** to be a value in the range from 0 through 4.

3. To train the links on the SFC to transmit traffic to the LCC, issue the **request chassis sib f13 slot f13 slot train-link-transmit** command.

**f13 slot** is the slot in the SFC where the SIB-TXP-F13-3D must be manually connected to SIB-TXP-3D-LCC in a slot (from 0 through 4) in the T4000 router. **f13 slot** has a value of 0, 3, 6, 8, or 11.

4. To train the links on the LCC to transmit traffic to the SFC, issue the **request chassis sib slot sibSlot train-link-transmit** command.

**sibSlot** is the slot in the LCC where SIB-TXP-3D-LCC must be manually connected to SIB-TXP-F13-3D in a slot (0, 3, 6, 8, or 11) in the SFC. You can configure **sibSlot** to be a value in the range from 0 through 4.

5. Verify the links between the LCC and the SFC by using the following commands:

- **show chassis fabric optical-links**
- **show chassis fabric plane extensive**
- **show chassis fabric topology**

6. If errors occur at this stage, take the SIB on the LCC offline and bring it back online. On the SFC, take the F13 SIB offline and bring it back online. Start training the links again.

### Activating and Verifying the Switching Plane

To activate and verify the upgraded switching plane:

1. To activate the switching plane with the new SIB, take another switching plane offline:

On the SFC, issue the **request chassis fabric plane *plane-num* offline sfc 0** command.

On the LCC, issue the **request chassis sib slot *sibSlot* offline** command.

For example, on the SFC:

```
user@host# request chassis fabric plane 1 offline sfc 0
```

On the LCC:

```
user@host# request chassis sib slot 1 offline
```

2. Use the **show chassis fabric stats rates summary** command on the LCC and **show chassis fabric stats f13 actPlaneSib1# rates summary** command on the SFC to verify that the traffic is flowing through all the planes in the LCC and the SFC, respectively.

If traffic is flowing smoothly, the statistics for **Data/sec** under **Received** and **Sent** shows a nonzero number.

3. Follow the procedures in “Upgrading the SIBs” on page 422, “Training the Switching Plane Links” on page 423, and “Activating and Verifying the Switching Plane” on page 425 for upgrading all the T4000 SIBs in the other planes.

#### Related Documentation

- [Preparing the SFC and the LCC for the Upgrade on page 421](#)
- [Upgrading the SIBs on page 422](#)
- [Training the Switching Plane Links on page 423](#)
- [Activating and Verifying the Switching Plane on page 425](#)

### Transferring Control of the T4000 Router (LCC 0) to the SFC

After upgrading the SIBs of a standalone T4000 router and integrating it into a routing matrix, transfer the control of the T4000 router to the SFC in the routing matrix:

1. On the SFC, confirm that the dial on the left, **CHASSIS ID**, displays **00** and that on the right, **CONFIG-SIZE**, displays **03**.
2. Connect the Ethernet links from the T4000 CBs to the CIP on the SFC. Verify that the Ethernet connection LED is lit on the CIP.
3. Manually set the **M/S** switch on both the replaced CBs of the T4000 router to **M** (multichassis).
4. Configure the T4000 router as LCC 0 by including the **lcc number** statement at the **[edit chassis]** hierarchy level.

```
[edit chassis]
user@host> set lcc number
```

- When all the SIBs are upgraded, delete the **fabric upgrade-mode** statement from the configuration hierarchy, and commit the changes on both the LCC and the SFC.

```
[edit chassis]
user@host# delete chassis fabric upgrade-mode 3d-fabric
user@host# commit
```

- After you configure LCC 0, reboot it for the changes to take effect. Reboot the SFC also. This rebooting process establishes the forwarding state of the new LCC in the TX Matrix Plus routing matrix by bringing up the SIBs automatically. For more information about hardware connectivity for the control plane, see the [TX Matrix Plus Hardware Guide](#).

## Adding a New T4000 Router to the TX Matrix Plus Routing Matrix

Junos OS does not support in-service upgrade of T4000 routers to LCC 2, LCC 4, and LCC 6. To add a second LCC to the TX Matrix Plus routing matrix:



**NOTE:** When you upgrade other T4000 routers to LCCs in the routing matrix, you must set the LCC number (*lcc-number*) to 2, 4, or 6.

- Upgrade both the CBs and Routing Engines on the T4000 router. For details, see “Upgrading the Control Boards, Routing Engines, PEMs, and Rear Fan Tray of the T4000 Router for Control Plane Connectivity” on page 421.
- Upgrade the T4000 router with the same version of Junos OS as that on the SFC.
- Upgrade the SIBs of the T4000 router and connect the new SIBs to the SFC. For details, see “Configuring Junos OS for Upgrading the SIBs on the T4000 Router and Connecting the Router to the SFC” on page 420.
- Connect Ethernet links of the control plane from the T4000 router to the SFC.
- Set the LCC mode on the SFC’s master Routing Engine to **t4000** by using the following commands:

```
user@host# set chassis lcc-mode lcc 0 mode t4000
user@host# set chassis lcc-mode lcc 1 mode empty
user@host# commit
```



**NOTE:** If you set `lcc-mode` for LCC 0, LCC 2, LCC 4, and LCC 6 as `t4000`, the `lcc-mode` value for the next LCC must be empty. `lcc-mode` for LCC 3, LCC 5, and LCC 7 must be empty in a routing matrix configuration with four T4000 LCCs.

6. Reboot the T4000 router. After rebooting, the router becomes part of the TX Matrix Plus routing matrix and is connected to the SFC on the control plane.

- See Also**
- [Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 412](#)
  - *Upgrading an Operational Standalone Router and Integrating It into a TX Matrix Plus Routing Matrix with 3D SIBs*

## Configuring Junos OS to Upgrade the T640 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs

The procedure for upgrading a T640 router to LCC 0 of a TX Matrix Plus routing matrix is the same as the procedure for upgrading a T1600 router. See “[Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs](#)” on page 412.

- Related Documentation**
- [Configuring Junos OS to Upgrade a T4000 Router to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 419](#)
  - [Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 412](#)
  - *Upgrading an Operational Standalone Router and Integrating It into a TX Matrix Plus Routing Matrix with 3D SIBs*



# Configuring M Series Chassis-Level Features

- [Configuring the Junos OS to Enable MTU Path Check for a Routing Instance on M Series Routers on page 429](#)
- [Configuring the Junos OS to Enable an M160 Router to Operate in Packet Scheduling Mode on page 431](#)
- [Configuring the Junos OS to Make an SFM Stay Offline on page 431](#)
- [Configuring the Junos OS to Support FPC to FEB Connectivity on M120 Routers on page 432](#)
- [Configuring the Junos OS to Support Eight Queues on IQ Interfaces for T Series and M320 Routers on page 434](#)
- [Configuring the Junos OS to Support Entry-Level Configuration on an M320 Router with a Minimum Number of SIBs and PIMs on page 435](#)

## Configuring the Junos OS to Enable MTU Path Check for a Routing Instance on M Series Routers

---

By default, the maximum transmission unit (MTU) check for routing instance is disabled on M Series routers (except the M120 and M320 routers).



**NOTE:** The MTU check is automatically present for interfaces belonging to the main router.

On M Series routers (except the M120 and M320 routers) you can configure MTU path checks on the outgoing interface for unicast traffic routed on a virtual private network (VPN) routing and forwarding (VRF) routing instance. When you enable MTU check, the router sends an Internet Control Message Protocol (ICMP) message when the size of a unicast packet traversing a VRF routing instance or virtual-router routing instance has exceeded the MTU size and when an IP packet is set to "do not fragment". The ICMP message uses the routing instance local address as its source address.

For an MTU check to work in a routing instance, you must include the **vrf-mtu-check** statement at the **[edit chassis]** hierarchy level and assign at least one interface containing an IP address to the routing instance.

To configure path MTU checks, complete the following tasks:

1. [Enabling MTU Check for a Routing Instance on page 430](#)
2. [Assigning an IP Address to an Interface in the Routing Instance on page 430](#)

## Enabling MTU Check for a Routing Instance

To enable MTU check for a routing instance, include the **vrf-mtu-check** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
vrf-mtu-check;
```

## Assigning an IP Address to an Interface in the Routing Instance

To assign an IP address to an interface in the VRF or virtual-router routing instance, configure the local address for that routing instance. A local address is any IP address derived from an interface that is assigned to the routing instance.

To assign an interface to a routing instance, include the **interface** statement at the **[edit routing-instances *routing-instance-name*]** hierarchy level:

```
[edit routing-instances routing-instance-name]
interface interface-name;
```

To configure an IP address for a loopback interface, include the **address** statement at the **[edit interfaces *interface-name* unit *logical-unit-number* family inet]** hierarchy level:

```
[edit interfaces interface-name unit logical-unit-number family inet]
address address;
```



**NOTE:** If you are assigning Internet Protocol Security (IPsec) or generic routing encapsulation (GRE) tunnel interfaces without IP addresses in the routing instance, include a loopback interface to the routing instance. To do this, include the **lo0.*n*** option at the **[edit routing-instances *routing-instance-name* interface]** hierarchy level. *n* cannot be 0, because lo0.0 is reserved for the main router (and not appropriate for use with routing instances). Also, an IP address must be assigned to this loopback interface in order to work. To set an IP address for a loopback interface, include the **address** statement at the **[edit interfaces lo0 unit *logical-unit-number* family inet]** hierarchy level.

See Also • [vrf-mtu-check on page 824](#)



## Configuring the Junos OS to Enable an M160 Router to Operate in Packet Scheduling Mode

By default, packet scheduling is disabled on M160 Routers. To configure a router to operate in packet-scheduling mode, include the **packet-scheduling** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
packet-scheduling;
```

To explicitly disable the **packet-scheduling** statement, include the **no-packet-scheduling** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
no-packet-scheduling;
```

When you enable packet-scheduling mode, the Packet Director application-specific integrated circuit (ASIC) schedules packet dispatches to compensate for transport delay differences. This preserves the interpacket gaps as the packets are distributed from the Packet Director ASIC to the Packet Forwarding Engine.

Whenever you change the configuration for packet-scheduling, the system stops all SFMs and FPCs and restarts them in the new mode.



**NOTE:** Packet scheduling is for M160 routers only.

## Configuring the Junos OS to Make an SFM Stay Offline

By default, if you use the **request chassis sfm** CLI command to take a Switching and Forwarding Module (SFM) offline, the SFM attempts to restart when you enter a **commit** CLI command. To prevent a restart, you can configure an SFM to stay offline. This feature is useful for repair situations.

To configure an SFM to stay offline, include the **sfm** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
sfm slot-number {
  power off;
}
```

- **slot number**—Slot number in which the SFM is installed.
- **power off**—Take the SFM offline and configure it to remain offline.

For example, the following statement takes an SFM in slot 3 offline:

```
[edit chassis]
```

```
sfm 3 power off;
```

Use the **show chassis sfm** CLI command to confirm the offline status:

```
user@host# show chassis sfm
```

Slot	State	Temp (C)	CPU Utilization (%)		Memory Utilization (%)		
			Total	Interrupt	DRAM (MB)	Heap	Buffer
0	Online	34	2	0	64	16	47
1	Online	38	2	0	64	16	47
2	Online	42	2	0	64	16	47
3	Offline	--- Configured power off ---					

To bring the SFM back online, delete the **edit chassis sfm** statement and then commit the configuration.

## Configuring the Junos OS to Support FPC to FEB Connectivity on M120 Routers

The M120 router supports six Forwarding Engine Boards (FEBs) and six Flexible PIC Concentrators (FPCs). The supported FPCs include:

- Two compact FPCs:
  - OC192 compact FPC (supported only on the D4 chip-based compact FPC)
  - 10-Gigabit Ethernet compact FPC
- Up to four Type 1, Type 2, or Type 3 FPCs

On the M120 router, you can map a connection between any FPC and any FEB. This capability allows you to configure resources for a chassis that contains empty slots, supporting configurations where the FPC and FEB pairs are not in slot order. You do not have to populate every empty slot position, but you must configure a FEB for every FPC.

If you do not want to map a connection between an FPC and a FEB, you must explicitly configure the FPC not to connect to the FEB. To do so, include the **none** option at the **[edit chassis fpc-feb-connectivity fpc number feb]** hierarchy level. If you do not configure FPC and FEB connectivity, it is automatically assigned in the following order: FPC 0 to FEB 0, FPC 1 to FEB 1, and so on.

For each FEB, you can map a maximum of two Type 1 FPCs or one Type 2, Type 3, or compact FPC.

The following restrictions apply when you configure FPC and FEB connectivity:

- When an FPC is configured not to connect to any FEB, interfaces on that FPC are not created.
- If a PIC comes online, but the FEB to which the FPC is configured to connect is not online, the physical interfaces for the PIC are not created. For example, PIC 1 on FPC 2 comes online. The configuration specifies that FPC 2 connects to FEB 3. If FEB 3 is not online at the time PIC 1 comes online, the physical interfaces corresponding to PIC 1 on FPC 2 are not created. If FEB 3 subsequently comes online, the physical interfaces are created.

- If a FEB is brought offline or removed, any interfaces on the FPCs connected to the FEB are deleted. If the FEB is subsequently brought back online, the interfaces are restored.
- FPCs and FEBs might reboot following a change in the FPC and FEB connectivity configuration. If an FPC connects to a different FEB as a result of the configuration change, the FPC is rebooted following the commit. As a result of the reboot, interfaces on the FPC are deleted.
- If a FEB connects to a different FPC or set of FPCs after a connectivity configuration change, the FEB is rebooted. The exception is if the FEB is already connected to one or two Type 1 FPCs and the change only results in the FEB being connected either to one additional or one fewer Type 1 FPC.

To configure a connection between an FPC and a FEB, include the **fpc-feb-connectivity** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
fpc-feb-connectivity {
  fpc number feb (slot-number | none);
}
```

For **fpc number**, enter a value from 0 through 5. For **feb slot-number**, enter a value from 0 through 5 or none. The **none** option disconnects the FPC from the FEB.

To view the current FPC and FEB mapping and the status of each FPC and FEB, issue the **show chassis fpc-feb-connectivity** operational mode command. For more information, see the [CLI Explorer](#).



**NOTE:** FPC-to-FEB connectivity is supported only on the M120 router.

In this example, FPC 3 is already mapped to FEB 3 by default. You are also mapping a connection between FPC 2 and FEB 3.

```
[edit chassis]
fpc-feb-connectivity {
  fpc 2 feb 3;
}
```

However, this configuration results in a mismatch between the FPC type and the FEB type. For example, FPC 3 is not a Type 1 FPC. You can map only one FPC that is not a Type 1 FPC to a FEB. Use the **fpc-feb-connectivity** statement to explicitly disconnect FPC 3 from FEB 3. To do so, include the **none** option at the **[edit chassis fpc-feb-connectivity fpc number feb]** hierarchy level:

```
[edit chassis]
fpc-feb-connectivity {
  fpc 2 feb 3;
  fpc 3 feb none;
}
```

**Related Documentation**

- [Configuring Junos OS to Support an External Clock Synchronization Interface for M Series, MX Series, and T Series Routers on page 292](#)
- [Configuring Port-Mirroring Instances on M120 Routers on page 228](#)

## Configuring the Junos OS to Support Eight Queues on IQ Interfaces for T Series and M320 Routers

By default, IQ PICs on T Series and M320 routers are restricted to a maximum of four egress queues per interface. To configure a maximum of eight egress queues on IQ interfaces, include the **max-queues-per-interface** statement at the **[edit chassis fpc slot-number pic pic-number]** hierarchy level:

```
[edit chassis fpc slot-number pic pic-number]
max-queues-per-interface (8 | 4);
```

On a TX Matrix or TX Matrix Plus router, include the **max-queues-per-interface** statement at the **[edit chassis lcc number fpc slot-number pic pic-number]** hierarchy level:

```
[edit chassis lcc number fpc slot-number pic pic-number]
max-queues-per-interface (8 | 4);
```



**NOTE:** The configuration at the **[edit class-of-service]** hierarchy level must also support eight queues per interface.

The maximum number of queues per IQ PIC can be 4 or 8. If you include the **max-queues-per-interface** statement, all ports on the IQ PIC use configured mode and all interfaces on the IQ PIC have the same maximum number of queues.

If you include the **max-queues-per-interface 4** statement, you can configure all four ports and configure up to four queues per port.

For 4-port OC3c/STM1 Type I and Type II PICs on M320 and T Series routers, when you include the **max-queues-per-interface 8** statement, you can configure up to eight queues on ports 0 and 2. After you commit the configuration, the PIC goes offline and comes back online with only ports 0 and 2 operational. No interfaces can be configured on ports 1 and 3.

For Quad T3 and Quad E3 PICs, when you include the **max-queues-per-interface 8** statement, you can configure up to eight queues on ports 0 and 2. After you commit the configuration, the PIC goes offline and comes back online with only ports 0 and 2 operational. No interfaces can be configured on ports 1 and 3.

When you include the **max-queues-per-interface** statement and commit the configuration, all physical interfaces on the IQ PIC are deleted and readded. Also, the PIC is taken offline and then brought back online immediately. You do not need to take the PIC offline and online manually. You should change modes between four queues and eight queues only when there is no active traffic going to the IQ PIC.

- Related Documentation**
- [Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC on page 471](#)
  - [Configuring the Junos OS to Enable Larger Delay Buffers for T1, E1, and DS0 Interfaces Configured on Channelized IQ PICs on page 471](#)

## Configuring the Junos OS to Support Entry-Level Configuration on an M320 Router with a Minimum Number of SIBs and PIMs

An M320 router can include an entry-level configuration with a minimum number of SIBs and PEMs. With this configuration, the router may have fewer than four SIBs or four PEMs.

To prevent unwanted alarms from occurring with this entry-level configuration, include the **pem minimum** and **sib minimum** statements at the **[edit chassis]** hierarchy level:

```
[edit chassis]
pem {
  minimum number;
}
sib {
  minimum number;
}
```

**minimum *number*** can be 0 through 3. With this configuration, SIB absent or PEM absent alarms are generated only if the SIB or PEM count falls below the minimum specified. For example, set this number to 2 for an entry-level configuration with 2 Switch Interface Boards and 2 Power Entry Modules.

- Related Documentation**
- [Configuring Port-Mirroring Instances on M320 Routers on page 228](#)
  - [Configuring Junos OS to Support an External Clock Synchronization Interface for M Series, MX Series, and T Series Routers on page 292](#)
  - [Configuring the Junos OS to Support Eight Queues on IQ Interfaces for T Series and M320 Routers on page 434](#)



# Configuring MX Series Chassis-Level Features

- [Configuring the Junos OS to Enable Session Offloading on MX Series 5G Universal Routing Platforms with MS-DPCs on page 437](#)
- [Configuring Voltage Level Monitoring of FPCs on page 438](#)
- [Accounting of the Layer 2 Overhead Attribute in Interface Statistics on page 439](#)
- [Configuring Layer 2 Overhead Accounting in Interface Statistics on page 441](#)
- [Verifying the Accounting of Layer 2 Overhead in Interface Statistics on page 443](#)

## Configuring the Junos OS to Enable Session Offloading on MX Series 5G Universal Routing Platforms with MS-DPCs

---

The Junos OS enables you to configure session offloading for Multiservices DPCs on MX Series routers. This enables Fast Update Filters (FUF) at the PIC level for a multiservices interface (***ms-fpc-pic-port***). To configure session offloading, include the **session-offload** statement at the **[edit chassis fpc slot-number pic number adaptive-services service-package extension-provider]** hierarchy level:

```
[edit chassis fpc slot-number pic number adaptive-services service-package  
extension-provider]  
session-offload;
```

Currently, session offloading is supported only for a maximum of one multiservices interface.



**NOTE:** When session offloading is enabled for a Multiservices PIC, we recommend that you limit dynamic application awareness features for Intrusion Detection and Prevention (IDP) only for that interface.

Related  
Documentation

- [session-offload on page 774](#)

## Configuring Voltage Level Monitoring of FPCs

---

You can monitor the voltage on the flexible PIC concentrator (FPC) at regular intervals. When the voltage falls below 10%, the FPC is offlined.

The faulty FPC is monitored at 500ms intervals. The output of the **show chassis fpc** command shows **Power Failure** for the faulty FPC. The FPC remains in powered down state until the voltage level is normal again.

- [Enabling Voltage Failure Errors on the FPC on page 438](#)
- [Disabling Voltage Failure Errors on the FPC on page 438](#)

### Enabling Voltage Failure Errors on the FPC

**fpc-nmi-volt-fail-knob** controls the behavior of the FPC after detecting voltage failure, and to online or offline the FPC based on the voltage level. To enable monitoring the voltage level on the FPC:

1. Navigate to the **[edit chassis]** hierarchy level.
2. Include the **set chassis fpc-nmi-volt-fail-knob enable** statement to enable voltage monitoring on the FPC.

```
[edit chassis]
{
  fpc-nmi-volt-fail-knob enable;
}
```

### Disabling Voltage Failure Errors on the FPC

To disable monitoring the voltage level on the FPC:

1. Navigate to the **[edit chassis]** hierarchy level.
2. Include the **set chassis fpc-nmi-volt-fail-knob disable** statement to disable voltage monitoring on the FPC.

```
[edit chassis]
{
  fpc-nmi-volt-fail-knob disable;
}
```

- Related Documentation
- [show chassis fpc on page 1666](#)
  - [fpc-nmi-volt-fail-knob on page 663](#)



## Accounting of the Layer 2 Overhead Attribute in Interface Statistics

On MX Series and T Series routers, you can configure the logical interface statistics to include the Layer 2 overhead size (header and trailer bytes) for both ingress and egress interfaces. Both the transit and total statistical information are computed and displayed for each logical interface. This functionality is supported on 1-Gigabit, 10-Gigabit, 40-Gigabit, and 100-Gigabit Ethernet interfaces on Dense Port Concentrators (DPCs), and Modular Port Concentrators (MPCs) on MX Series routers. Starting with Junos OS Release 13.2, configuring the logical interface statistics to include Layer 2 is supported on 10-Gigabit Ethernet interfaces on MX Series routers with MPC4E. Starting with Junos OS Release 13.3, **account-layer2-overhead** is not supported on MX Series routers with MPC3E (on both PIC and logical interface levels).

You can also configure the capability to compute the Layer 2 overhead bytes in interface statistics on Type-3, Type-4 and Type-5 Flexible Port Concentrators (FPCs) on T Series routers. To enable the Layer 2 overhead bytes to be counted in the interface statistics at the PIC level, you must use the **account-layer2-overhead** statement at the **[edit chassis fpc slot-number pic pic-number]** hierarchy level.

If you configure this capability, all the Layer 2 header details (Layer 2 header and cyclic redundancy check [CRC]) based on the Layer 2 encapsulation configured for an interface are calculated and displayed in the logical interface statistics for ingress and egress interfaces in the output of the **show interfaces interface-name** commands. For logical interfaces, the **Input bytes** and **Output bytes** fields under the Traffic statistics section in the output of the **show interfaces interface-name <detail | extensive>** command include the Layer 2 overhead of the packets. For logical interfaces, the Input rate and Output rate fields under the Traffic statistics section in the output of the **show interfaces interface-name <media | statistics>** command include the Layer 2 overhead of the packets. For logical interfaces, the values for the newly added **Egress account overhead** and **Ingress account overhead** fields display the Layer 2 overhead size for transmitted and received packets respectively.

The input and output octets at the logical interface configured on the PIC includes all the Layer 2 headers. All the logical interfaces on the PIC, including the ae and the non-ae interfaces, are processed for Layer 2 overhead accounting for the arriving and exiting packets. This method of operation impacts the transit statistics that are primarily used for subscriber accounting and billing purposes in customer networks.

Table 66 on page 440 lists the adjustment bytes that are counted based on the encapsulation on the logical interface over the Ethernet interface, when you enable accounting of Layer 2 overhead in interface statistics at the PIC level. The values for the adjustment bytes that are listed for all types of encapsulation are the same for DPCs and MPCs, with the only exception being for the VLAN CCC adjustment value. On DPCs, the VLAN CCC adjustment value is -4 bytes and on MPCs, the VLAN CCC adjustment value is +4 bytes.

*Table 66: Adjustment Bytes for Logical Interfaces over Ethernet Interfaces*

Encapsulation Type on Logical Interfaces	Number of Adjustment Bytes	Description
Ethernet DIXv2 (IP datagrams over Ethernet)	18	Untagged (includes CRC)
Ethernet DIXv2 (IP datagrams over Ethernet)	22	Single-tagged (includes CRC)
Ethernet DIXv2 (IP datagrams over Ethernet)	26	Double-tagged (includes CRC)
VLAN Bridge	4	CRC
VLAN CCC	4	CRC
VLAN TCC	18	Untagged (includes CRC)
VLAN TCC	22	Single-tagged (includes CRC)
VLAN TCC	26	Double-tagged (includes CRC)
VLAN VPLS	4	CRC

### Guidelines for Configuring the Computation of Layer 2 Overhead in Interface Statistics

Keep the following points in mind when you configure the computation of Layer 2 overhead in interface statistics:

- When you configure a native VLAN ID on a logical interface, the Layer 2 header adjustment for input statistics is different for tagged and untagged packets. For such interfaces, if you configure the setting to account for Layer 2 overhead, incorrect statistics might be displayed.
- An untagged packet is considered as a tagged packet and an additional 4 bytes are appended to the counter values displayed in the output of the **show interface** command.
- The computed statistics might not be completely accurate in scenarios where the packets are dropped after they have been included in the interface statistics, but before the packets reach the destination.
- Label-switched interface (LSI) statistics on the ingress direction of interfaces do not include the Layer 2 overhead bytes because this functionality of accounting Layer 2 overhead is not supported for such LSI interfaces.
- Layer 2 overhead accounting is not supported for inline service (si) interfaces.
- The total statistics of interfaces do not indicate the complete Layer 2 adjusted statistics. This behavior occurs because the total statistics count is the sum of transit and local statistics. Only the transit statistics are adjusted for Layer 2 and the local statistics are not adjusted for Layer 2.
- Statistics on ae interfaces are calculated in the same manner as non-ae interfaces.

- Adjustment bytes are applicable only for transit statistics that are displayed for logical interfaces.
- For physical interfaces, the adjustment bytes for transit traffic and the non-adjusted bytes for local or protocol-specific traffic are combined and displayed in the output of the **show interfaces** command. (Segregation is not possible.)
- Layer 2 overhead accounting can be enabled at both PIC level and logical interface level.
- When the **account-layer2-overhead** statement is configured, the Layer 2 overhead size in both input and output statistics is accounted for in Dense Port Concentrator (DPCs) and Modular Port Concentrator (MPCs).
- This **account-layer2-overhead** configuration now supports Layer 2 accounting for the Ethernet bridge encapsulation.
- The Layer 2 overhead bytes in interface statistics are saved across a unified ISSU or a graceful Routing Engine switchover (GRES) operation.

#### Release History Table

Release	Description
13.3	Starting with Junos OS Release 13.3, <b>account-layer2-overhead</b> is not supported on MX Series routers with MPC3E (on both PIC and logical interface levels).
13.2	Starting with Junos OS Release 13.2, configuring the logical interface statistics to include Layer 2 is supported on 10-Gigabit Ethernet interfaces on MX Series routers with MPC4E.

#### Related Documentation

- [Configuring Layer 2 Overhead Accounting in Interface Statistics on page 441](#)
- [Verifying the Accounting of Layer 2 Overhead in Interface Statistics on page 443](#)
- [account-layer2-overhead on page 591](#)
- *Ethernet Interfaces Feature Guide for Routing Devices*

## Configuring Layer 2 Overhead Accounting in Interface Statistics

This topic contains sections that describe the configuration of Layer 2 overhead accounting for interface statistics at the PIC level and logical interface level.

Layer 2 overhead accounting can be enabled at both PIC level and logical interface level through configuration. By default, the physical interface and logical interface statistics do not account for Layer 2 overhead size (header and trailer) in both input and output statistics.

When the **account-layer2-overhead** statement is configured, the Layer 2 overhead size in both input and output statistics is accounted for in the Dense Port Concentrator (DPCs)

and the Modular Port Concentrator (MPCs). This **account-layer2-overhead** configuration now supports Layer 2 accounting for the Ethernet bridge encapsulation.

- [Enabling the Accounting of Layer 2 Overhead in Interface Statistics at the PIC Level on page 442](#)

## Enabling the Accounting of Layer 2 Overhead in Interface Statistics at the PIC Level

You can configure the **account-layer2-overhead** statement at the **edit chassis fpc slot-number pic pic-number** hierarchy level to enable accounting of Layer 2 overhead bytes in the ingress and egress interface statistics at the PIC level.



**CAUTION:** If you modify the setting for accounting of Layer 2 overhead bytes at the PIC level, the PIC is rebooted, causing all of the physical and logical interfaces to be deleted and readded on the PIC. Due to this behavior, we recommend that you exercise caution while using this feature.

The computation method of Layer 2 overhead on different interface types is as follows:

- For Ethernet interfaces, all the Layer 2 headers are counted.
- For non-Ethernet interfaces, the Frame Relay, PPP, or Cisco HDLC headers are counted, while the bit or byte stuffing headers are excluded.

To enable accounting of Layer 2 overhead at the PIC level for ingress and egress traffic on interfaces:

1. Access a DPC or an MPC-occupied slot and the PIC where the interface is to be enabled.

```
[edit chassis]
user@host# edit fpc slot-number pic number
```

2. Specify the Layer 2 overhead value in bytes that is the octet adjustment per packet added to the total octet count for ingress and egress traffic on all the interfaces in the PIC.

```
[edit chassis fpc slot-number pic number]
user@host# set account-layer2-overhead
```

- See Also**
- [Accounting of the Layer 2 Overhead Attribute in Interface Statistics on page 439](#)
  - [Verifying the Accounting of Layer 2 Overhead in Interface Statistics on page 443](#)
  - [account-layer2-overhead on page 591](#)
  - *Ethernet Interfaces Feature Guide for Routing Devices*

## Verifying the Accounting of Layer 2 Overhead in Interface Statistics

**Purpose** Display information about the Layer 2 overhead bytes that are counted in interface statistics for egress and ingress traffic on Ethernet interfaces.

**Action** • To display information about the Layer 2 overhead bytes that are counted in interface statistics:



**NOTE:** For physical and logical interfaces, the values displayed for the **Input rate** and **Output rate** fields under the **Traffic statistics** section include the Layer 2 overhead of the packets.

```
user@host> show interfaces ge-5/2/0 statistics detail
```

```
Physical interface: ge-5/2/0, Enabled, Physical link is Up
Interface index: 146, SNMP ifIndex: 519, Generation: 149
Link-level type: Ethernet, MTU: 1514, Speed: 1000mbps, BPDU Error: None, MAC-REWRITE Error: None,
Loopback: Disabled,
Source filtering: Disabled, Flow control: Enabled, Auto-negotiation: Enabled, Remote fault: Online
Device flags   : Present Running
Interface flags: SNMP-Traps Internal: 0x4000
Link flags     : None
CoS queues     : 8 supported, 8 maximum usable queues
Hold-times     : Up 0 ms, Down 0 ms
Current address: 00:1d:b5:61:d9:74, Hardware address: 00:1d:b5:61:d9:74
Last flapped   : 2009-11-11 11:24:00 PST (09:23:08 ago)
Statistics last cleared: 2009-11-11 17:50:58 PST (02:56:10 ago)
Traffic statistics:
Input bytes   :          271524          0 bps
Output bytes  :       37769598       352 bps
Input packets :          3664          0 pps
Output packets:       885790          0 pps
IPv6 transit statistics:
Input bytes   :           0
Output bytes  :       16681118
Input packets :           0
Output packets:       362633
Multicast statistics:
IPv4 multicast statistics:
Input bytes   :       112048          0 bps
Output bytes  :       20779920          0 bps
Input packets :        1801          0 pps
Output packets:       519498          0 pps
IPv6 multicast statistics:
Input bytes   :       156500          0 bps
Output bytes  :       16681118          0 bps
Input packets :        1818          0 pps
Output packets:       362633          0 pps
Input errors:
Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Policed discards: 0, L3 incompletes: 0, L2 channel
errors: 0,
L2 mismatch timeouts: 0, FIFO errors: 0, Resource errors: 0
```

## Output errors:

Carrier transitions: 0, Errors: 0, Drops: 0, Collisions: 0, Aged packets: 0, FIFO errors: 0, HS link  
CRC errors: 0, MTU errors: 0,  
Resource errors: 0

Egress queues: 8 supported, 4 in use

Queue counters:	Queued packets	Transmitted packets	Dropped packets
0 best-effort	882558	882558	0
1 expedited-fo	0	0	0
2 assured-forw	0	0	0
3 network-cont	3232	3232	0

Active alarms : None

Active defects : None

Logical interface ge-5/2/0.0 (Index 71) (SNMP ifIndex 573) (Generation 135)

Flags: SNMP-Traps 0x4000 Encapsulation: ENET2

Egress account overhead: 100

Ingress account overhead: 90

## Traffic statistics:

Input bytes :	271524
Output bytes :	37769598
Input packets:	3664
Output packets:	885790

## IPv6 transit statistics:

Input bytes :	0
Output bytes :	16681118
Input packets:	0
Output packets:	362633

## Local statistics:

Input bytes :	271524
Output bytes :	308560
Input packets:	3664
Output packets:	3659

## Transit statistics:

Input bytes :	0	0 bps
Output bytes :	37461038	0 bps
Input packets:	0	0 pps
Output packets:	882131	0 pps

## IPv6 transit statistics:

Input bytes :	0
Output bytes :	16681118
Input packets:	0
Output packets:	362633

## Multicast statistics:

## IPv4 multicast statistics:

Input bytes :	112048	0 bps
Output bytes :	20779920	0 bps
Input packets:	1801	0 pps
Output packets:	519498	0 pps

## IPv6 multicast statistics:

Input bytes :	156500	0 bps
Output bytes :	16681118	0 bps
Input packets:	1818	0 pps
Output packets:	362633	0 pps

Protocol inet, MTU: 1500, Generation: 151, Route table: 0

Addresses, Flags: Is-Preferred Is-Primary

Destination: 40.40.40.0/30, Local: 40.40.40.2, Broadcast: 40.40.40.3, Generation: 167

Protocol inet6, MTU: 1500, Generation: 152, Route table: 0

Addresses, Flags: Is-Preferred Is-Primary

Destination: ::40.40.40.0/126, Local: ::40.40.40.2

Generation: 169

```
Addresses, Flags: Is-Preferred
  Destination: fe80::/64, Local: fe80::21d:b5ff:fe61:d974
Protocol multiservice, MTU: Unlimited, Generation: 171
Generation: 153, Route table: 0
Policer: Input: __default_arp_policer__
```

- Related Documentation**
- [Accounting of the Layer 2 Overhead Attribute in Interface Statistics on page 439](#)
  - [Configuring Layer 2 Overhead Accounting in Interface Statistics on page 441](#)
  - *show interfaces*
  - *show interfaces statistics*
  - *Ethernet Interfaces Feature Guide for Routing Devices*





# Configuring T Series Chassis-Level Features

- [Configuring OSS Mapping to Represent a T4000 Chassis as a T1600 or a T640 Chassis on page 447](#)
- [Example: Configuring a T4000 Chassis to Represent a T640 Chassis on page 449](#)

## Configuring OSS Mapping to Represent a T4000 Chassis as a T1600 or a T640 Chassis

You can configure the operations support systems (OSS) mapping feature to represent a T4000 chassis as a T1600 chassis or a T640 chassis. This topic includes the following tasks:

- [Configuring T4000 Chassis as a T1600 Chassis on page 447](#)
- [Configuring T4000 Chassis as a T640 Chassis on page 447](#)
- [Disabling the OSS Mapping Feature on page 448](#)

### Configuring T4000 Chassis as a T1600 Chassis

To configure a T4000 chassis as a T1600 chassis:

1. In configuration mode, go to the **[edit chassis]** hierarchy level.

```
[edit]  
user@T4000# edit chassis
```

2. Configure the OSS mapping feature to map the T4000 chassis to a T1600 chassis.

```
[edit chassis]  
user@T4000# set oss-map model-name t1600
```

### Configuring T4000 Chassis as a T640 Chassis

To configure a T4000 chassis as a T640 chassis:

1. In configuration mode, go to the **[edit chassis]** hierarchy level.

```
[edit]
```

```
user@T4000# edit chassis
```

2. Configure the OSS mapping feature to map the T4000 chassis to a T640 chassis.

```
[edit chassis]  
user@T4000# set oss-map model-name t640
```



**NOTE:** By default, the OSS mapping feature is disabled.

## Disabling the OSS Mapping Feature

To disable the OSS mapping feature:

1. In configuration mode, go to the **[edit chassis]** hierarchy level.

```
[edit]  
user@T4000# edit chassis
```

2. Disable the OSS mapping feature that maps a T4000 chassis to a T640 chassis.

```
[edit chassis]  
user@T4000# delete oss-map model-name t640
```

3. Disable the OSS mapping feature that maps a T4000 chassis to a T1600 chassis.

```
[edit chassis]  
user@T4000# delete oss-map model-name t1600
```



**NOTE:**

- The **set chassis oss-map model-name t640 | t1600** command is applicable only on T4000 routers. You must explicitly set this command when a T1600 chassis or a T640 chassis is upgraded to a T4000 chassis.
- You can execute the **set chassis oss-map model-name t640** command or the **set chassis oss-map model-name t1600** command if the OSS is compatible with either the T640 chassis or the T1600 chassis, respectively.

- See Also**
- [Example: Configuring a T4000 Chassis to Represent a T640 Chassis on page 449](#)
  - [oss-map on page 726](#)
  - [show chassis oss-map on page 2018](#)

## Example: Configuring a T4000 Chassis to Represent a T640 Chassis

This example shows how to configure OSS mapping feature to represent a T4000 chassis as a T640 chassis. You can extend this concept to configure a T4000 chassis to represent as a T1600 chassis as well.

- [Requirements on page 449](#)
- [Overview on page 449](#)
- [Configuring the T4000 Chassis to Represent a T640 Chassis on page 450](#)
- [Verification on page 450](#)

### Requirements

This example uses the following hardware and software components:

- One T4000 router
- Junos OS Release 12.3R3, 13.1R2, 13.2R1, or later

### Overview

Operations support systems (OSS) is used by service providers to maintain their networks. When a new router is added or removed from the network, the OSS must be updated to reflect the changes. This process is tedious and time-consuming.

When a T1600 chassis or a T640 chassis is upgraded to a T4000 chassis, the OSS identifies the new chassis as a new networking element and follows a tedious process of qualifying it for the customer's network. The *OSS mapping feature* helps avoid this scenario.

Using the OSS mapping feature, you can map a T4000 chassis to a T1600 chassis or to a T640 chassis with the **set chassis oss-map model-name t640|t1600** configuration command. This configuration command overrides the chassis model name, so that the OSS recognizes the chassis as a known chassis and proceeds without any requalification.



#### NOTE:

- The **set chassis oss-map model-name t640 | t1600** command is applicable only on T4000 routers. You must explicitly set this command when a T1600 chassis or a T640 chassis is upgraded to a T4000 chassis.
- You can execute the **set chassis oss-map model-name t640** command or the **set chassis oss-map model-name t1600** command, if the OSS is compatible with either the T640 chassis or the T1600 chassis, respectively.

## Configuring the T4000 Chassis to Represent a T640 Chassis

**Step-by-Step Procedure** To configure the T4000 chassis to represent a T640 chassis by using the OSS mapping feature:

1. In configuration mode, go to the **[edit chassis]** hierarchy level.

```
[edit]
user@T4000# edit chassis
```

2. Configure the OSS mapping feature to map the T4000 chassis to a T640 chassis.

```
[edit chassis]
user@T4000# set oss-map model-name t640
```

## Verification

### Verifying the OSS Mapping Feature

**Purpose** To verify that the OSS mapping feature is working on a T4000 router.

**Action** Run the `show chassis operational` command and verify that the configured known chassis name is displayed when the T4000 chassis is mapped to a T640 chassis.

- Run the **show chassis hardware** operational command:

```
user@T4000> show chassis hardware
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN11B3892AHA	T640
Midplane	REV 01	710-027486	RC9848	T-series Backplane
FPM GBUS	REV 13	710-002901	BBAG5143	T640 FPM Board
FPM Display	REV 04	710-021387	BBAL2705	T1600 FPM Display
CIP	REV 06	710-002895	BBAL3705	T-series CIP
PEM 1	REV 03	740-036442	VJ00054	Power Entry Module
6x60				
SCG 0	REV 18	710-003423	BBAJ0727	T640 Sonet Clock Gen.
SCG 1	REV 18	710-003423	BBAE3887	T640 Sonet Clock Gen.
Routing Engine 0	REV 06	740-026941	P737F-002705	RE-DUO-1800
Routing Engine 1	REV 06	740-026941	P737F-002675	RE-DUO-1800
CB 0	REV 09	710-022597	EF7371	LCC Control Board
....				

- Run the **show chassis hardware detail** operational command:

```
user@T4000> show chassis hardware detail
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN11B3892AHA	T640
Midplane	REV 01	710-027486	RC9848	T-series Backplane

```

FPM GBUS          REV 13   710-002901  BBAG5143          T640 FPM Board
FPM Display       REV 04   710-021387  BBAL2705          T1600 FPM Display
CIP               REV 06   710-002895  BBAL3705          T-series CIP
PEM 1            REV 03   740-036442  VJ00054          Power Entry Module
6x60
SCG 0             REV 18   710-003423  BBAJ0727          T640 Sonet Clock Gen.
SCG 1             REV 18   710-003423  BBAE3887          T640 Sonet Clock Gen.
Routing Engine 0 REV 06   740-026941  P737F-002705      RE-DUO-1800
  ad0   3823 MB SMART CF          201101050335CCFACCFA Compact Flash
  ad1   62720 MB SMART Lite SATA Drive 2011021700D8789F789F Disk 1
Routing Engine 1 REV 06   740-026941  P737F-002675      RE-DUO-1800
  ad0   3823 MB SMART CF          201011150208AF59AF59 Compact Flash
  ad1   62720 MB SMART Lite SATA Drive 2010122700A160026002 Disk 1
CB 0              REV 09   710-022597  EF7371           LCC Control Board
....

```

- Run the **show chassis hardware extensive** operational command:

```

user@T4000> show chassis hardware extensive

Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis
Jedec Code:   0x7fb0          EEPROM Version: 0x02
S/N:          JN11B3892AHA
Assembly ID:  0x0507          Assembly Version: 00.00
Date:         00-00-0000      Assembly Flags:  0x00
....

```

### Verifying the OSS Mapping Feature on SNMP MIBs

**Purpose** To verify that the SNMP MIBs are updated with the configured known chassis name.

**Action** Run the **show snmp mib** operational commands and verify that the configured known chassis name is displayed in SNMP MIBs when the T4000 chassis is mapped to a T640 chassis:

- Run the **show snmp mib walk system** operational command:

```

user@T4000> show snmp mib walk system

sysDescr.0    = Juniper Networks, Inc. t640 internet router, kernel JUNOS
12.3-...Juniper Networks, Inc.
sysObjectID.0 = jnxProductNameT640
...

```

- Run the **show snmp mib walk jnxBoxAnatomy** operational command:

```

user@T4000> show snmp mib walk jnxBoxAnatomy

jnxBoxClass.0 = jnxProductLineT640.0
jnxBoxDescr.0 = Juniper t640 Internet Backbone Router
jnxBoxSerialNo.0 = JN11B3892AHA
jnxBoxRevision.0
....

```

**Meaning** On configuring the OSS mapping feature, the OSS maps the T4000 chassis to a T640 chassis, thereby preventing requalification of the new chassis.

**Related Documentation**

- [Configuring OSS Mapping to Represent a T4000 Chassis as a T1600 or a T640 Chassis on page 447](#)
- [oss-map on page 726](#)
- [show chassis oss-map on page 2018](#)

# Configuring PTX Series Chassis-Level Features

- [Configuring Port Speed on page 453](#)
- [License Modes for PTX Series Routers on page 454](#)
- [Configuring FPC Error Levels and Actions on page 455](#)
- [Managing FPC Errors on page 456](#)

## Configuring Port Speed

---

Starting with Junos OS Release 15.1, some PICs support multiple port speeds. This procedure describes how to configure the port speed for these types of PICs.

To configure a PIC's port speed:

1. Navigate to the **[edit chassis]** hierarchy level.
2. Enter the **port-speed** statement at the **[edit chassis fpc slot-number pic pic-number port port-number]** hierarchy level.

```
[edit chassis]
user@host# set fpc fpc-slot pic pic-number port port-number port-speed ;
```

3. Specify the port speed that needs to be configured. You can use one of the following speed attributes for this configuration.

```
[edit chassis]
user@host# set fpc fpc-slot pic pic-number port port-number port speed 10G;
user@host# set fpc fpc-slot pic pic-number port port-number port speed 40G;
user@host# set fpc fpc-slot pic pic-number port port-number port speed 100G;
```

## Release History Table

Release	Description
15.1	Starting with Junos OS Release 15.1, some PICs support multiple port speeds.

Related Documentation

- [speed on page 743](#)

## License Modes for PTX Series Routers

PTX Series routers are available in two license variants: IR and R. Depending on the license purchased, the router offers full IP or LSR.

[Table 67 on page 454](#) describes the two license variants for the PTX1000.

*Table 67: License Variants for the PTX1000*

License	Description	Scale Restrictions
IR	Scaled up LSR and peering	<ul style="list-style-type: none"> <li>• Up to 1 million routes in the forwarding information base (FIB)</li> <li>• Up to 6 million routes in the routing information base (RIB)</li> <li>• Up to 256 routing instances of the virtual routing and forwarding (VRF) instance type</li> <li>• Up to 128 thousand LSPs</li> </ul>
R	Full IP core	None



**NOTE:** The license-mode statement is only supported on the PTX3000 and PTX5000 Series routers with third-generation FPCs.

[Table 68 on page 454](#) describes the two license variants for the PTX3000 and PTX5000.

*Table 68: License Variants for the PTX3000 and PTX5000 FPCs*

License	Description	Scale Restrictions
IR	Scaled up LSR and peering	<ul style="list-style-type: none"> <li>• Up to 2 million routes in the forwarding information base (FIB)</li> <li>• Up to 6 million routes in the routing information base (RIB)</li> <li>• Up to 256 routing instances of the virtual routing and forwarding (VRF) instance type</li> <li>• Up to 128 thousand LSPs</li> </ul>
R	Full IP core	None



For the PTX3000 and PTX5000, if you purchase two FPCs: one with an IR license and one with an R license. After the FPCs are installed on a router, both FPCs appear identical. To distinguish between an FPC with an IR license and an FPC with an R license after the FPC is installed on the router, you must configure the license mode based on the license purchased. For instance, if you purchased an FPC with the IR license, you must configure the license mode for that FPC as IR. The license mode settings are set specific to each FPC slot. If the FPC is installed in a different slot, or moved to another device, the license mode settings must be reconfigured on the new slot or device. Also, the license mode settings previously configured must be deleted.



**NOTE:** The license mode settings are used only to provide information. You cannot set or alter the license of the FPC by configuring the license mode.

To view the current license mode settings, from the configuration mode, use the **show chassis fpc** command. To view the current license mode settings, from the operational mode, use the **show chassis hardware extensive** command. To delete the existing license mode settings, use the **delete chassis fpc** command.

#### Related Documentation

- *Junos OS Feature License Keys*
- *License Enforcement*
- *Configuring the JET Application and its License on a Device Running Junos OS*

## Configuring FPC Error Levels and Actions

Starting with Junos OS Release 13.3 or Release 14.2 for M320 routers, you can use MX Series, PTX Series, and T Series routers to configure Packet Forwarding Engine (PFE)-related error levels on FPCs and the actions to perform when a specified threshold is reached. In Junos OS Release 13.2 and earlier, Packet Forwarding Engine errors would disable the FPC. When you use the **error** command, Packet Forwarding Engine errors can be isolated, which reduces the need for a field replacement. This command is available at the **[edit chassis fpc slot-number]** and **[edit chassis]** (MX Series routers only) hierarchies.

To configure Packet Forwarding Engine error levels and actions for an FPC:

- (Optional) Configure the fatal error level threshold and action:

```
[edit chassis fpc fpc-number error]
user@host# set fatal action action
user@host# set fatal threshold threshold-level
```

- (Optional) Configure the major error level threshold and action:

```
[edit chassis fpc fpc-number error]
user@host# set major action action
user@host# set major threshold threshold-level
```

- (Optional) Configure the minor error level threshold and action:

```
[edit chassis fpc fpc-number error]
user@host# set minor action action
user@host# set minor threshold threshold-level
```

Starting with Junos OS Release 18.1R3, MX Series routers support configuration of error thresholds and actions at the error scope and error category levels. Use the command **set chassis fpc fpc-slot error scope error-scope category category (fatal | major | minor) threshold error-threshold action (alarm | disable-pfe | get-state | offline | log | reset)** to configure a threshold and action for a particular error scope and category at the FPC level. You can also configure these features at the chassis level (at the **[edit chassis]** hierarchy). However, threshold and action configured at the **[edit chassis fpc]** hierarchy overrides the same configuration at the **[edit chassis]** hierarchy.

You can use the command **show chassis fpc errors** to view the error information at the error scope and category level.

If you have configured the action **log** against a particular error threshold, the system logs the event when the error count breaches the set threshold. The following sample syslog messages indicate an error threshold breach and the resultant action being taken:

```
Sep 17 23:12:10 sw-s3-u8-03 fpc0 Error:
/fpc/0/pfe/0/cm/0/PE_Chip/1/PECHIP_CMERROR_OQB_INT_REG_RD_ADDR_ERR (0x21078b),
scope: pfe, category: functional, severity: minor, module: PE Chip, type:
Description for PECHIP_CMERROR_OQB_INT_REG_RD_ADDR_ERR
```

```
Sep 17 23:12:10 sw-s3-u8-03 fpc0 Performing action log for error
/fpc/0/pfe/0/cm/0/PE_Chip/1/PECHIP_CMERROR_OQB_INT_REG_RD_ADDR_ERR (0x21078b) in
module: PE Chip with scope: pfe category: functional level: minor
```

#### Release History Table

Release	Description
13.3	Starting with Junos OS Release 13.3 or Release 14.2 for M320 routers, you can use MX Series, PTX Series, and T Series routers to configure Packet Forwarding Engine (PFE)-related error levels on FPCs and the actions to perform when a specified threshold is reached.

#### Related Documentation

- [Fabric Resiliency and Degradation on page 132](#)
- [error on page 641](#)
- [fpc error on page 659](#)
- [Example: Configuring FPC Error Detection and Self-Healing on T Series Core Routers on page 576](#)

## Managing FPC Errors

On the PTX10001 routers, you can disable an FPC error or modify the severity of the error at the error-id level. The error-id, which uniquely identifies an FPC error, is represented

in the uniform resource identifier (URI) format and is composed of a module identifier and an error identifier. If an error occurs, you can find the error-id in the system log messages.

- [Modifying Severity of an Error on page 457](#)
- [Disabling an Error on page 457](#)

## Modifying Severity of an Error

Though you cannot configure a new error severity, you can modify the existing severity of an error. For example, if you do not want to treat a particular error (identified by an error-id) as fatal anymore, you can modify its severity to major or minor as required.



**NOTE:** You cannot modify the error severity at a group (for example, category) level.

To modify the severity of an error, use the following command:

```
user@host# set chassis fpc fpc-slot error error-id severity new-severity
```

See the following example:

```
user@host# set chassis fpc 3 error "/cpu/0/memory/0/ECC_CORRECTED_ERROR" severity
minor
```

In the above example, you modified the severity of the error ID  
“/cpu/0/memory/0/memory-uncorrected-error” in FPC 3 to **minor**.

## Disabling an Error

To configure the system to stop reporting an error, identify the error-id and disable it. You can find the error-id in the system log messages. To disable an error, use the following command:

```
user@host# set chassis fpc fpc-slot error error-id state disable
```

See the following example:

```
user@host# set chassis fpc 3 error "/cpu/0/memory/0/ECC_CORRECTED_ERROR" state disable
```

In the above example, you disabled the error  
“/cpu/0/memory/0/memory-uncorrected-error” in FPC 3.

- See Also**
- [Fabric Resiliency and Degradation on page 132](#)
  - [Example: Configuring FPC Error Detection and Self-Healing on T Series Core Routers on page 576](#)



# Configuring PIC-Specific Features

- [Configuring the Junos OS to Make a Flexible PIC Concentrator Stay Offline on page 459](#)
- [Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 461](#)
- [Configuring Junos OS to Enable SONET/SDH Framing for ATM MICs on page 464](#)
- [Configuring the Junos OS to Use ATM Cell-Relay Accumulation Mode on an ATM1 PIC on page 466](#)
- [Configuring the Junos OS to Support the Sparse DLCI Mode on Channelized STM1 or Channelized DS3 PICs on page 466](#)
- [Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized \(Multiplexed\) Mode on page 467](#)
- [Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 468](#)
- [Ranges for Channelized E1 Interfaces Configuration on page 470](#)
- [Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC on page 471](#)
- [Configuring the Junos OS to Enable Larger Delay Buffers for T1, E1, and DS0 Interfaces Configured on Channelized IQ PICs on page 471](#)
- [Maximum Delay Buffer with q-pic-large-buffer Statement Enabled on page 472](#)
- [Configuring a Policer Overhead on page 473](#)
- [Configuring Mixed-Rate Mode Operation on page 474](#)
- [Configuring Port Speed on Multi-Rate MICs on page 475](#)

## Configuring the Junos OS to Make a Flexible PIC Concentrator Stay Offline

---

By default, a Flexible PIC Concentrator (FPC) is configured to restart after a system reboot. To configure an FPC to stay offline and prevent it from restarting, include the **power off** statement at the **[edit chassis fpc slot-number]** hierarchy level:

```
[edit chassis fpc slot-number]  
power off;
```



NOTE: You can use the `request chassis fpc operational mode` command to take an FPC offline, but the FPC attempts to restart when you enter a `commit` CLI command.

To bring an FPC online that is configured to stay offline and configure it to stay online, include the `power on` statement at the `[edit chassis fpc slot-number]` hierarchy level:

```
[edit chassis fpc slot-number]  
power on;
```

**Related  
Documentation**

- [Configuring the Junos OS to Make an SFM Stay Offline on page 431](#)

## Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs

In Junos OS Release 8.4 and later, the family of next-generation SONET Phase I PICs includes Type 1 and Type 2 PICs. Each PIC type has three varieties.

Type1 PICs include:

- 2-port OC3
- 4-port OC3
- 1-port OC12

Type 2 PICs include:

- 1-port OC48
- 4-port OC3
- 4-port OC12

The PICs are supported on Type 1 and Type 2 FPC interfaces. Hot-pluggable SFPs are used as optical transponders. The PICs provide unprecedented flexibility by allowing the user to configure a variety of modes on them through the configuration of concatenation/nonconcatenation and speed.

The 4-port OC48 PIC with SFP installed, the next-generation SONET/SDH PICs with SFP, and the 4-port OC192 PIC on M Series and T Series routers, support SONET or SDH framing on a per-port basis. This functionality allows you to mix SONET and SDH modes on interfaces on a single PIC.

Port level framing is supported for only the PICs listed below in Table 1. This is expected behavior.

**Table 69: PICs supporting port level framing**

I2C-ID Name	Model Number	PIC Type
1xCOC12 Q2 PIC	1x CHOC12 IQE SONET	Type 1
4xCOC12 Q2 PIC	4x CHOC12 IQE SONET	Type 2
4xCOC12 Q2 TYPE3 PIC	4x CHOC12 (TYPE3) IQE SONET	Type 3
1x COC48 Q2 PIC	1x CHOC48 IQE SONET	Type 2
1x OC12 Q2 PIC	1x OC12 IQE SONET	Type 1
2xCOC3 Q2 PIC	2x CHOC-3 IQE SONET	Type 1
4xOC3 Q2 PIC	4x OC-3 IQE SONET	Type 1
8OC3OC12 4OC48 MIC	MIC-3D-8OC3OC12-4OC48	—
4OC3OC12 1OC48 MIC	MIC-3D-4OC3OC12-1OC48	—



Table 69: PICs supporting port level framing (continued)

I2C-ID Name	Model Number	PIC Type
8CHOC3 4CHOC12 MIC	MIC-3D-8CHOC3-4CHOC12	—
4CHOC3 2CHOC12 MIC	MIC-3D-4CHOC3-2CHOC12	—
1CHOC48 MIC	MIC-3D-1CHOC48 SFP	—
1OC192 HO VCAT MIC	MIC-3D-1OC192-XFP	—
IQECC 4XOC48 TYPE3 PIC	4x OC-48 IQE SONET	Type 3
CE 4xCOC3 SFP PIC	4x CHOC3 SONET CE SFP	—
2XOC12 8XOC3 ATM SFP MIC	2xOC12/8xOC3 CC-CE	—

For information about configuring port speed for concatenate mode on a next-generation PIC, see the *Junos OS Hardware Network Operations Guide*.

By default, SONET/SDH PICs use SONET framing. For a discussion of the differences between the two standards, see the *SONET/SDH Interfaces Feature Guide for Routing Devices*.

To configure a PIC to use SDH framing, include the **framing** statement at the **[edit chassis fpc slot-number pic pic-number]** hierarchy level, specifying the **sdh** option:

```
[edit chassis]
user@host# set fpc slot-number pic pic-number framing sdh
[edit chassis]
user@host# show
fpc slot-number {
  pic pic-number {
    framing sdh;
  }
}
```

On a TX Matrix or TX Matrix Plus router, include the **framing** statement at the **[edit chassis lcc number fpc slot-number pic pic-number]** hierarchy level, specifying the **sdh** option:

```
[edit chassis lcc number]
user@host# set fpc slot-number pic pic-number framing sdh
[edit chassis lcc number]
user@host# show
fpc slot-number {
  pic pic-number {
    framing sdh;
  }
}
```

To explicitly configure a PIC to use SONET framing, include the **framing** statement at the **[edit chassis fpc slot-number pic pic-number]** hierarchy level, specifying the **sonet** option:

```
[edit chassis]
user@host# set fpc slot-number pic pic-number framing sonet
[edit chassis]
user@host# show
fpc slot-number {
  pic pic-number {
    framing sonet;
  }
}
```

On a TX Matrix or TX Matrix Plus router, include the **framing** statement at the **[edit chassis lcc number fpc slot-number pic pic-number]** hierarchy level, specifying the **sonet** option:

```
user@host# set fpc slot-number pic pic-number framing sonet
[edit chassis lcc number]
user@host# show
fpc slot-number {
  pic pic-number {
    framing sonet;
  }
}
```

**Related  
Documentation**

- [TX Matrix Router and T640 Router Configuration Overview on page 373](#)
- [TX Matrix Plus Router Configuration Overview on page 397](#)
- [Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized \(Multiplexed\) Mode on page 467](#)

---

## Configuring Junos OS to Enable SONET/SDH Framing for ATM MICs

---

In Junos OS Release 12.1 and later, the ATM MIC enables support for ATM pseudowire on MX Series routers. ATM MICs are rate-selectable at the following rates: 2-port OC12 or 8-port OC3. The MICs are supported on MPC interfaces. Hot-pluggable SFPs are used as optical transponders. The MICs allow the user to configure both the mode and the speed. The ATM MIC (2-port OC12 and the 8-port OC3) with SFP installed support SONET or SDH framing on a per-port or per-PIC basis. To enable the entire MIC to function in either SONET or SDH mode, you can configure framing at the MIC level. To enable the framing on a port-by-port basis, you can configure framing at the port level.



**NOTE:** This topic uses the term PIC for ATM MICs and the term FPC for MPC where the reference is to a CLI or Junos OS entity.

---

By default, ATM MICs use SONET framing. For a discussion of the differences between the two standards, see the *SONET/SDH Interfaces Feature Guide for Routing Devices*.

To configure the MIC to use SDH framing on a per-PIC basis:

1. At the **[edit chassis]** hierarchy level in configuration mode, specify the PIC and the framing mode to be configured.

```
[edit chassis]
user@host# set fpc fpc-slot pic pic-number framing sdh;
```

For example:

```
[edit chassis]
user@host# set fpc 2 pic 0 framing sdh;
```

2. Verify the configuration.

```
[edit chassis]
user@host# show
fpc 2 {
  pic 0 {
    framing sdh;
  }
}
```

To configure the MIC to use SDH framing on a per-port basis:

1. At the **[edit chassis]** hierarchy level in configuration mode, specify the PIC, port number, and the framing mode to be configured.

```
[edit chassis]
user@host# set fpc fpc-slot pic pic-number port port-number framing sdh;
```

For example:

```
[edit chassis]
user@host# set fpc 2 pic 0 port 0 framing sdh;
```

2. Verify the configuration.

```
[edit chassis]
user@host# show
fpc 2 {
  pic 0 {
    port 0 {
      framing sdh;
    }
  }
}
```

- Related Documentation**
- [Configuring Port Speed on Multi-Rate MICs on page 475](#)

## Configuring the Junos OS to Use ATM Cell-Relay Accumulation Mode on an ATM1 PIC

You can configure an Asynchronous Transfer Mode (ATM) 1 PIC to use cell-relay accumulation mode. In this mode, the incoming cells (one to eight cells) are packaged into a single packet and forwarded to the label-switched path (LSP). At the edge router, this packet is divided into individual cells and transmitted over the ATM interface.



**NOTE:** When you configure an ATM PIC to use cell-relay accumulation, all ports on the ATM PIC use cell-relay accumulation mode.

To configure an ATM PIC to use cell-relay accumulation mode, include the **atm-cell-relay-accumulation** statement at the **[edit chassis fpc slot-number pic pic-number]** hierarchy level:

```
[edit chassis fpc slot-number pic pic-number ]
  atm-cell-relay-accumulation;
```

On a TX Matrix or TX Matrix Plus router, include the **atm-cell-relay-accumulation** statement at the **[edit chassis lcc number fpc slot-number pic pic-number]** hierarchy level:

```
[edit chassis lcc number fpc slot-number pic pic-number]
  atm-cell-relay-accumulation;
```

- Related Documentation**
- [Configuring the Junos OS to Enable ATM2 Intelligent Queuing Layer 2 Circuit Transport Mode on page 501](#)
  - [Configuring the Junos OS to Support ILM1 for Cell Relay Encapsulation on an ATM2 IQ PIC on page 471](#)
  - [Configuring the Junos OS to Enable Idle Cell Format and Payload Patterns for ATM Devices on page 502](#)
  - [atm-cell-relay-accumulation on page 602](#)

## Configuring the Junos OS to Support the Sparse DLCI Mode on Channelized STM1 or Channelized DS3 PICs

By default, original channelized DS3 and original channelized STM1-to-E1 (or T1) interfaces can support a maximum of 64 data-link connection identifiers (DLCIs) per channel—as many as 1792 DLCIs per DS3 interface or 4032 DLCIs per STM1 interface (0 through 63).

In sparse DLCI mode, the full DLCI range (1 through 1022) is supported. This allows you to use circuit cross-connect (CCC) and translation cross-connect (TCC) features by means of Frame Relay on T1 and E1 interfaces.



**NOTE:** Sparse DLCI mode requires a Channelized STM1 or Channelized DS3 PIC.

DLCI 0 is reserved for Local Management Interface (LMI) signaling.

Channelized T3 (CT3) intelligent queuing (IQ) and STM1 IQ interfaces support a maximum of 64 DLCIs, numbered 0 through 1022, and therefore do not require sparse mode.

The CT3 PIC must use field-programmable gate array (FPGA) hardware revision 17 to run sparse DLCI mode.

To configure the router to use sparse DLCI mode, include the **sparse-dlcis** statement at the **[edit chassis fpc slot-number pic pic-number]** hierarchy level:

```
[edit chassis fpc slot-number pic pic-number ]
sparse-dlcis;
```

#### Related Documentation

- [Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized \(Multiplexed\) Mode on page 467](#)
- [Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 495](#)
- [Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 468](#)
- [Configuring the Junos OS to Support Channelized STM1 Interface Virtual Tributary Mapping on page 497](#)
- [Configuring the Junos OS to Enable Larger Delay Buffers for T1, E1, and DS0 Interfaces Configured on Channelized IQ PICs on page 471](#)

## Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized (Multiplexed) Mode

By default, SONET PICs (interfaces with names **so-fpc/pic/port**) operate in concatenated mode, a mode in which the bandwidth of the interface is in a single channel.

To configure a PIC to operate in channelized (multiplexed) mode, include the **no-concatenate** statement at the **[edit chassis fpc slot-number pic pic-number]** hierarchy level:

```
[edit chassis]
user@host# set fpc slot-number pic pic-number no-concatenate
[edit chassis]
user@host# show
fpc slot-number {
  pic pic-number {
    no-concatenate;
```

```
}
}
```

On a TX Matrix or TX Matrix Plus router, include the **no-concatenate** statement at the **[edit chassis lcc number fpc slot-number pic pic-number]** hierarchy level:

```
[edit chassis lcc number]
user@host# set fpc slot-number pic pic-number no-concatenate
[edit chassis lcc number]
user@host# show
fpc slot-number {
  pic pic-number {
    no-concatenate;
  }
}
```

When configuring and displaying information about interfaces that are operating in channelized mode, you must specify the channel number in the interface name (*physical:channel*); for example, *so-2/2/0:0* and *so-2/2/0:1*.



**NOTE:** On SONET OC48 interfaces that are configured for channelized (multiplexed) mode, the *bytes e1-quiet* and *bytes f1* options in the *sonet-options* statement have no effect. The *bytes f2*, *bytes z3*, *bytes z4*, and *path-trace* options work correctly on channel 0. These bytes work in the transmit direction only on channels 1, 2, and 3.

The M160 four-port SONET/SDH OC12 PIC can run each of the OC12 links in concatenated mode only and requires a Type 2 M160 FPC. Similarly, the 4-port SONET/SDH OC3 PIC cannot run in nonconcatenated mode on any platform.

#### Related Documentation

- [Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 461](#)
- [Configuring the Junos OS to Support the Sparse DLCI Mode on Channelized STM1 or Channelized DS3 PICs on page 466](#)

## Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs

Each Channelized E1 PIC has 10 E1 ports that you can channelize to the *NxDS0* level. Each E1 interface has 32 time slots (DS0), in which time slot 0 is reserved. You can combine one or more of these timeslots (DS-0) to create a channel group (*NxDS-0*). There can be a maximum of 32 channel groups per E1 interface. Thus, you can configure as many as 320 channel groups per PIC (10 ports x 32 channel groups per port).

To specify the DS0 channel group number in the interface name, include a colon (:) as a separator. For example, a Channelized E1 PIC might have the following physical and virtual interfaces:

```
ds-0/0/0:x
```

where *x* is a DS0 channel group ranging from 0 through 23. (See [Table 70 on page 470](#) for more information about ranges.)

You can use any of the values within the range available for *x*; you do not have to configure the links sequentially. The software applies the interface options you configure according to the following rules:

- You can configure the **e1-options** statement for channel group 0 only; for example, **ds-0/0/0:0**.
- There are no restrictions on changing the default **ds0-options**.
- If you delete a configuration you previously committed for channel group 0, the options return to the default values.

To configure the channel groups and time slots for a Channelized E1 interface, include the **channel-group** and **timeslots** statements at the **[edit chassis fpc slot-number pic pic-number ce1 e1 port-number]** hierarchy level:

```
[edit chassis fpc slot-number pic pic-number ce1 e1 port-number]
channel-group channel-number timeslots slot-number;
```



**NOTE:** If you commit the interface name but do not include the **[edit chassis]** configuration, the Channelized E1 PIC behaves like a standard E1 PIC: none of the DS0 functionality is accessible.



**NOTE:** The FPC slot range depends on the platform. The maximum range of 0 through 7 applies to M40 routers; for M20 routers, the range is 0 through 3; for M10 routers the range is 0 through 1; for M5 routers, the only applicable value is 0. The Channelized E1 PIC is not supported on M160 routers.

The theoretical maximum number of channel groups possible per PIC is  $10 \times 24 = 240$ . This is within the maximum bandwidth available.

There are 32 time slots on an E1 interface. You can designate any combination of time slots for usage.

To use time slots 1 through 10, designate **slot-number** as in this example:

```
[edit chassis fpc 1 pic 2 ce1 e1 6]
```

```
channel-group 3 timeslots 1-10;
```

To use time slots 1 through 5, time slot 10, and time slot 24, designate *slot-number* as in this example:

```
[edit chassis fpc 3 pic 0 ce1 e1 2]
channel-group 1 timeslots 1-5,10,24;
```

Do not include spaces in a list of time slot numbers.

**Related Documentation**

- [Ranges for Channelized E1 Interfaces Configuration on page 470](#)

## Ranges for Channelized E1 Interfaces Configuration

Table 70 on page 470 shows the ranges for configuring channel groups and time slots for Channelized E1 Interfaces.

*Table 70: Ranges for Channelized E1 Configuration*

Item	Variable	Range
FPC slot	<i>slot-number</i>	0 through 7 (see note below)
PIC slot	<i>pic-number</i>	0 through 3
E1 port	<i>port-number</i>	0 through 9
DSO channel group	<i>group-number</i>	0 through 23
Time slot	<i>slot-number</i>	1 through 32



**NOTE:** The FPC slot range depends on the router. For the TX Matrix and TX Matrix Plus routers, the range is from 0 through 31. For the TX Matrix Plus routers with 3D SIBs, the range is from 0 through 63. For M40, M40e, M160, M320, M120, and other T Series routers, the range is from 0 through 7. For M20 routers, the range is from 0 through 3. For M10 and M10i routers, the range is from 0 through 1. For M5 and M7i routers, the only applicable value is 0.

**Related Documentation**

- [Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 468](#)



## Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC

Integrated Local Management Interface (ILMI) is supported on AAL5 interfaces, regardless of transport mode. To enable ILMI on interfaces with cell-relay encapsulation, you must configure an ATM2 IQ PIC to use Layer 2 circuit trunk transport mode.

To configure ILMI on an interface with cell-relay encapsulation, include the following statements:

```
[edit chassis fpc slot-number pic pic-number]
  atm-l2circuit-mode trunk trunk;
[edit interfaces at-fpc/pic/port]
  encapsulation atm-ccc-cell-relay;
  atm-options {
    ilmi;
    pic-type atm2;
  }
  unit logical-unit-number {
    trunk-id number;
  }
```

**Related Documentation** • [Configuring the Junos OS to Enable ATM2 Intelligent Queuing Layer 2 Circuit Transport Mode on page 501](#)

## Configuring the Junos OS to Enable Larger Delay Buffers for T1, E1, and DS0 Interfaces Configured on Channelized IQ PICs

By default, T1, E1, and NxDS0 interfaces configured on channelized IQ PICs are limited to 100,000 microseconds of delay buffer. (The default average packet size on the IQ PIC is 40 bytes.) For these interfaces, it might be necessary to configure a larger buffer size to prevent congestion and packet dropping.

To ensure traffic is queued and transmitted properly, you can configure a buffer size larger than the default maximum. To set the average packet size used to calculate the number of notification queue entries in the IQ PIC to 256 bytes, include the **q-pic-large-buffer large-scale** statement at the **[edit chassis fpc slot-number pic pic-number]** hierarchy level:

```
[edit chassis fpc slot-number pic pic-number]
  q-pic-large-buffer {
    large-scale;
  }
```

On a TX Matrix router or a TX Matrix Plus router, include the **q-pic-large-buffer large-scale** statement at the **[edit chassis lcc number fpc slot-number pic pic-number]** hierarchy level:

```
[edit chassis lcc number fpc slot-number pic pic-number]
  q-pic-large-buffer {
```

```
large-scale;
}
```



**NOTE:** When you commit the configuration after including the `q-pic-large-buffer` statement for a PIC, the Junos OS temporarily takes the PIC offline and brings it back online before the new configuration is activated and becomes the current operational configuration.

This statement sets the maximum buffer size. (See [Table 71 on page 472](#).)

#### Related Documentation

- [Maximum Delay Buffer with q-pic-large-buffer Statement Enabled on page 472](#)

## Maximum Delay Buffer with q-pic-large-buffer Statement Enabled

[Table 71 on page 472](#) lists the maximum delay buffer that can be configured for T1, E1, and DS0 interfaces configured on Channelized IQ PICs:

**Table 71: Maximum Delay Buffer with q-pic-large-buffer Statement Enabled**

Platform, PIC, or Interface Type	Maximum Buffer Size
<b>With Large Buffer Sizes Not Enabled</b>	
T Series and M320 routers	50,000 microseconds
Other M Series routers	200,000 microseconds
IQ PICs on all routers	100,000 microseconds
Channelized T1/E1 interface on J Series Services Routers	400,000 microseconds
<b>With Large Buffer Sizes Enabled</b>	
Channelized T3 and channelized OC3 DLCIs—Maximum sizes vary by shaping rate:	
With shaping rate from 64,000 through 255,999 bps	4,000,000 microseconds
With shaping rate from 256,000 through 511,999 bps	2,000,000 microseconds
With shaping rate from 512,000 through 1,023,999 bps	1,000,000 microseconds
With shaping rate from 1,024,000 through 2,048,000 bps	500,000 microseconds
With shaping rate from 2,048,001 bps through 10 Mbps	400,000 microseconds

*Table 71: Maximum Delay Buffer with q-pic-large-buffer Statement Enabled (continued)*

Platform, PIC, or Interface Type	Maximum Buffer Size
With shaping rate from 10,000,001 bps through 20 Mbps	300,000 microseconds
With shaping rate from 20,000,001 bps through 30 Mbps	200,000 microseconds
With shaping rate from 30,000,001 bps through 40 Mbps	150,000 microseconds
With shaping rate up to 40,000,001 bps or higher	100,000 microseconds
NxDSO IQ Interfaces—Maximum sizes vary by channel size:	
1xDSO through 3xDSO	4,000,000 microseconds
4xDSO through 7xDSO	2,000,000 microseconds
8xDSO through 15xDSO	1,000,000 microseconds
16xDSO through 32xDSO	500,000 microseconds
Other IQ interfaces	500,000 microseconds

**Related Documentation**

- [Configuring the Junos OS to Enable Larger Delay Buffers for T1, E1, and DSO Interfaces Configured on Channelized IQ PICs on page 471](#)

## Configuring a Policer Overhead

Configuring a policer overhead allows you to control the rate of traffic sent or received on an interface. When you configure a policer overhead, the configured policer overhead value (bytes) is added to the length of the final Ethernet frame. This calculated length of frame is used to determine the policer or the rate limit action. Therefore, the policer overhead enables you to control the rate of traffic sent or received on an interface. You can configure the policer overhead to rate-limit queues and Layer 2 and MAC policers. The policer overhead and the shaping overhead can be configured simultaneously on an interface.

This feature is supported on M Series and T Series routers with IQ2 PICs or IQ2E PICs, and on MX Series DPCs.

To configure a policer overhead for controlling the rate of traffic sent or received on an interface:

1. In the **[edit chassis]** hierarchy level in configuration mode, create the interface on which to add the policer overhead to input or output traffic.

```
[edit chassis]
user@host# edit fpc fpc pic pic
```

For example:

```
[edit chassis]
user@host# edit fpc 0 pic 1
```

2. Configure the policer overhead to control the input or output traffic on the interface. You could use either statement or both the statements for this configuration.

```
[edit chassis fpc fpc pic pic]
user@host# set ingress-policer-overhead bytes;
user@host# set egress-policer-overhead bytes;
```

For example:

```
[edit chassis fpc 0 pic 1]
user@host# set ingress-policer-overhead 10;
user@host# set egress-policer-overhead 20;
```

3. Verify the configuration:

```
[edit chassis]
user@host# show
fpc 0 {
  pic 1 {
    ingress-policer-overhead 10;
    egress-policer-overhead 20;
  }
}
```



**NOTE:** When the configuration for the policer overhead bytes on a PIC is changed, the PIC goes offline and then comes back online. In addition, the configuration in the CLI is on a per-PIC basis and, therefore, applies to all the ports on the PIC.

- Related Documentation
- [egress-policer-overhead on page 638](#)
  - [ingress-policer-overhead on page 679](#)

## Configuring Mixed-Rate Mode Operation

To configure mixed-rate mode operation for a PF-24XGE-SFPP PIC:

1. Navigate to the **[edit chassis]** hierarchy level.

2. On a T4000 router, configure the mixed-rate mode by including the **mixed-rate-mode** statement at the **[edit chassis fpc slot-number pic pic-number]** hierarchy level.

```
[edit chassis]
user@host# set fpc fpc-slot pic pic-number mixed-rate-mode
```

On an LCC in a routing matrix, configure the mixed-rate mode by including the **mixed-rate-mode** statement at the **[edit chassis lcc lcc number fpc slot-number pic pic-number]** hierarchy level.

```
[edit chassis]
user@host# set lcc lcc number fpc fpc-slot pic pic-number mixed-rate-mode
```

3. Specify the port and the port speed that need to be configured. You can use one of the following speed attributes for this configuration.

```
[edit chassis]
user@host# set fpc fpc-slot pic pic-number port port-number speed 1G;
user@host# set fpc fpc-slot pic pic-number port port-number speed 10G;
user@host# set lcc lcc number fpc fpc-slot pic pic-number speed 1G;
user@host# set lcc lcc number fpc fpc-slot pic pic-number speed 10G;
```



**NOTE:** On a 12 port 10-Gigabit Ethernet PIC (PF-12XGE-SFPP), you can configure the port speed as 1G by including the **set fpc fpc-slot pic pic-number port port-number speed 1G** statement at the **[edit chassis]** hierarchy level.



**NOTE:** To change the port speed from 10 Gbps to 1 Gbps on PF-24XGE-SFPP and PF-12XGE-SFPP PICs, SFP optics is required.

To disable mixed-rate mode operation, include the **delete chassis fpc x pic y mixed-rate-mode** statement at the **[edit chassis]** hierarchy level.

- Related Documentation**
- *Modes of Operation of 10-Gigabit Ethernet PICs*
  - [mixed-rate-mode on page 711](#)

## Configuring Port Speed on Multi-Rate MICs

Configuring a port speed allows you to enable rate-selectability on a per-port basis. When you configure a speed on a per-port basis, you can use the same MIC hardware as you upgrade your network from OC3 to OC12 or OC48 speeds.

This feature is supported on MX Series routers with SONET/SDH OC3/STM1 (Multi-Rate) MICs (MIC-3D-8OC3OC12-4OC48-SFP and MIC-3D-4OC3OC12-1OC48-SFP), Channelized

SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP (MIC-3D-8CHOC3-4CHOC12 and MIC-3D-4CHOC3-2CHOC12), and ATM MICs with SFP (MIC-3D-8OC3-2OC12-ATM).

To configure a port speed on the chassis for enabling rate-selectability on a per-port basis:

1. At the **[edit chassis]** hierarchy level in configuration mode, specify the port and the port speed that need to be configured. You can use one of the following speed attributes for this configuration.

```
[edit chassis]
user@host# set fpc fpc-slot pic pic-number port port-number speed oc12-stm4 ;
user@host# set fpc fpc-slot pic pic-number port port-number speed oc3-stm1 ;
user@host# set fpc fpc-slot pic pic-number port port-number speed oc48-stm16 ;
```



**NOTE:** You can configure the oc12-stm4, oc3-stm1, and oc48-stm16 port speed options for SONET/SDH OC3/STM1 (Multi-Rate) MICs. However, for Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP and ATM MICs, you can configure only the oc12-stm4 and oc3-stm1 port speed options.

(MX Series with MPCs and ATM MICs with SFP) To configure up to OC12 CBR bandwidth speed per virtual circuit (VC) on an ATM MIC with SFP (MIC-3D-8OC3-2OC12-ATM), specify oc12-stm4 as the speed for the specified port. You can configure the oc12-stm4 port speed option only for ports 0 and 4 on an ATM MIC. If you configure the oc12-stm4 port speed option for port 0, then ports 1, 2, and 3 are disabled. Similarly, if you configure the oc12-stm4 port speed for port 4, then ports 5, 6, and 7 are disabled.

For example:

```
[edit chassis]
user@host# set fpc 3 pic 0 port 0 speed oc12-stm4
```

2. Verify the configuration:

```
[edit chassis]
user@host# show
fpc 3 {
  pic 0 {
    port 0 {
      speed oc12-stm4;
    }
  }
}
```

By default, rate-selectability is enabled on MX Series routers with SONET/SDH OC3/STM1 (Multi-Rate) MICs, Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP, and ATM MICs.

To disable rate-selectability on the 8-port SONET/SDH OC3/STM1 (Multi-Rate) MIC:

1. At the **[edit chassis]** hierarchy level in configuration mode, disable rate-selectability by using the **no-multi-rate** statement.

```
[edit chassis]
user@host# set fpc fpc-slot pic pic-number no-multi-rate
```

For example:

```
[edit chassis]
user@host# set fpc 3 pic 0 no-multi-rate
```



**NOTE:**

- The **no-multi-rate** statement is supported only on MIC-3D-8OC3OC12-4OC48.
- The **no-multi-rate** statement enables the first four ports [0 – 3] exclusively at OC48/STM16 speed.
- The **no-multi-rate** statement disables the last four ports [4 – 7].

2. Verify the configuration:

```
[edit chassis]
user@host# show
fpc 3 {
  pic 0 {
    no-multi-rate;
  }
}
```



**NOTE:** You can disable rate-selectability by using the **no-multi-rate** statement only on the 8-port SONET/SDH OC3/STM1 (Multi-Rate) MIC with SFP. The **no-multi-rate** statement has no effect on the 4-port SONET/SDH OC3/STM1 (Multi-Rate) MIC with SFP, the Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP, or the ATM MIC.

Related  
Documentation

- [speed on page 784](#)
- [no-multi-rate on page 718](#)





# Configuring Resynchronization of FPC Sequence Numbers when a new FPC is Brought Online

- [Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 479](#)

## Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online

---

On M320, T320, T640, T1600, T4000, TX Matrix, and TX Matrix Plus routers, when you bring a Flexible PIC Concentrator (FPC) online, the sequence number on the FPC may not be synchronized with the other active FPCs in the router, which may result in the loss of a small amount of initial traffic.

To avoid any traffic loss, include the **fpc-resync** statement at the **[edit chassis]** hierarchy level. This ensures that the sequence numbers of the FPC that is brought online is resynchronized with the other active FPCs in the router.

```
[edit chassis]
fpc-resync;
```



**NOTE:** In order to prevent traffic blackholing, the **fpc-resync** command will have no effect if a single LMNR based FPC and one or more I-chip FPCs exist in the same chassis.

Related Documentation • [fpc-resync on page 666](#)



# Configuring Chassis Settings to Support Aggregated Devices

- [Configuring Junos OS for Supporting Aggregated Devices on page 481](#)

## Configuring Junos OS for Supporting Aggregated Devices

---

Junos OS supports the aggregation of physical devices into defined virtual links, such as the link aggregation of Ethernet interfaces defined by the IEEE 802.3ad standard.

Tasks for configuring aggregated devices are:

- [Configuring Virtual Links for Aggregated Devices on page 481](#)
- [Configuring LACP Link Protection at the Chassis Level on page 482](#)
- [Enabling LACP Link Protection on page 483](#)
- [Configuring System Priority on page 483](#)
- [Configuring the Maximum Links Limit on page 484](#)
- [Configuring PPM on Junos Fusion on page 484](#)

## Configuring Virtual Links for Aggregated Devices

To define virtual links, you need to specify the associations between physical and logical devices within the **[edit interfaces]** hierarchy, and assign the correct number of logical devices by including the **device-count** statement at the **[edit chassis aggregated-devices ethernet]** and **[edit chassis aggregated-devices sonet]** hierarchy levels:

```
[edit chassis]
aggregated-devices {
  ethernet {
    device-count number;
  }
  sonet {
    device-count number;
  }
}
```

The aggregated interfaces are numbered from **ae0** through **ae4091**. The maximum number of aggregated interfaces supported by different routers is listed below:

- For PTX Series routers, you can configure a maximum of 128 aggregated interfaces.
- For M Series and T Series routers, you can configure a maximum of 128 aggregated interfaces (LAG bundles).
- In Junos release 14.2R2 and earlier, you can configure a maximum of 480 aggregated interfaces on MX Series routers.
- In Junos release 14.2R3 and later, you can configure a maximum of 1000 aggregated interfaces on MX240, MX480, and MX960 routers.
- In Junos release 14.2R3 and later, you can configure a maximum of 800 aggregated interfaces on MX2010 and MX2020 routers.
- In Junos OS 15.1F5 and 15.1F6 releases, you can configure a maximum of 480 aggregated interfaces on MX240, MX480, and MX960 routers.
- In Junos OS 15.1F5 and 15.1F6 releases, you can configure a maximum of 800 aggregated interfaces on MX2010 and MX2020 routers.

For SONET/SDH, starting with Junos OS Release 13.2, the maximum number of logical interfaces is 64, numbered from **as0** through **as63**. In releases before Junos OS Release 13.2, the maximum was 16.

## Configuring LACP Link Protection at the Chassis Level

Link Aggregation Control Protocol (LACP) is one method of bundling several physical interfaces to form one logical interface. You can configure both VLAN-tagged and untagged aggregated Ethernet with or without LACP enabled. LACP exchanges are made between actors and partners. An actor is the local interface in an LACP exchange. A partner is the remote interface in an LACP exchange.

LACP link protection enables you to force active and standby links within an aggregated Ethernet. You configure LACP link protection by using the **link-protection** and **system-priority** statements at either the chassis or interface level and by configuring port priority at the interface level using the **system-priority** statement. Configuring LACP parameters at the chassis level results in all aggregated Ethernet interfaces using the defined values unless overridden by the LACP configuration on a specific interface.

```
[edit chassis]
aggregated-devices {
  ethernet {
    lacp {
      link-protection {
        non-revertive;
      }
      system-priority priority;
    }
  }
}
```



**NOTE:** LACP link protection also uses port priority. You can configure port priority at the Ethernet interface [gigether-options] hierarchy level using the `port-priority` statement. If you choose not to configure port priority, LACP link protection uses the default value for port priority (127).

## See Also

### Enabling LACP Link Protection

To enable LACP link protection for aggregated Ethernet interfaces on the chassis, use the `link-protection` statement at the [edit chassis aggregated-devices ethernet lacp] hierarchy level:

```
[edit chassis aggregated-devices ethernet lacp]
link-protection {
  non-revertive;
}
```

By default, LACP link protection reverts to a higher-priority (lower-numbered) link when that higher-priority link becomes operational or a link is added to the aggregator that is determined to be higher in priority. However, you can suppress link calculation by adding the `non-revertive` statement to the LACP link protection configuration. In nonrevertive mode, after a link is active and collecting and distributing packets, the subsequent addition of a higher-priority (better) link does not result in a switch, and the current link remains active.



**BEST PRACTICE:** (MX Series) In a highly scaled configuration over aggregated Ethernet, we recommend that you prevent the router from performing such a switch by including the `non-revertive` statement. Failure to do so may result in some traffic loss if a MIC on which a member interface is located reboots. Using the `non-revertive` statement for this purpose is not effective if both the primary and secondary interfaces are on the MIC that reboots.



**CAUTION:** If both ends of an aggregator have LACP link protection enabled, make sure to configure both ends of the aggregator to use the same mode. Mismatching LACP link protection modes can result in lost traffic.

### Configuring System Priority

To configure LACP system priority for aggregated Ethernet interfaces on the chassis, use the `system-priority` statement at the [edit chassis aggregated-devices ethernet lacp] hierarchy level:

```
[edit chassis aggregated-devices ethernet lacp]
```

```
system-priority priority;
```

The system priority is a 2-octet binary value that is part of the LACP system ID. The LACP system ID consists of the system priority as the two most-significant octets and the interface MAC address as the six least-significant octets. The system with the numerically lower value for system priority has the higher priority. By default, system priority is 127, with a range of 0 through 65,535.

## Configuring the Maximum Links Limit

To configure the maximum links limit, use the **maximum-links** statement at the **[edit chassis aggregated-devices]** hierarchy level:

```
[edit chassis aggregated-devices]  
maximum-links maximum-links-limit;
```

## Configuring PPM on Junos Fusion

If you use Junos Fusion with Junos OS Release 14.2R3, you need to ensure that link aggregation (and STP) work properly by configuring timers for the periodic packet management (PPM) daemons on the aggregation and satellite devices. We recommend using the following timer values:

```
[edit routing-options ppm]  
redistribution-timer 120;  
tcp-keepalive-interval 3000;  
tcp-keepalive-idle 3000;
```

Starting in Junos OS Release 14.2R4, the timer values that ensure proper link aggregation and STP functions are configured by default if you use Junos Fusion with Junos OS.

Release History Table

Release	Description
15.1F5	In Junos OS 15.1F5 and 15.1F6 releases, you can configure a maximum of 480 aggregated interfaces on MX240, MX480, and MX960 routers.
15.1F5	In Junos OS 15.1F5 and 15.1F6 releases, you can configure a maximum of 800 aggregated interfaces on MX2010 and MX2020 routers.
14.2R4	Starting in Junos OS Release 14.2R4, the timer values that ensure proper link aggregation and STP functions are configured by default if you use Junos Fusion with Junos OS.
14.2R3	In Junos release 14.2R3 and later, you can configure a maximum of 1000 aggregated interfaces on MX240, MX480, and MX960 routers.
14.2R3	In Junos release 14.2R3 and later, you can configure a maximum of 800 aggregated interfaces on MX2010 and MX2020 routers.
14.2R3	If you use Junos Fusion with Junos OS Release 14.2R3, you need to ensure that link aggregation (and STP) work properly by configuring timers for the periodic packet management (PPM) daemons on the aggregation and satellite devices.
14.2R2	In Junos release 14.2R2 and earlier, you can configure a maximum of 480 aggregated interfaces on MX Series routers.
13.2	For SONET/SDH, starting with Junos OS Release 13.2, the maximum number of logical interfaces is 64, numbered from <b>as0</b> through <b>as63</b> .

**Related  
Documentation**

- *Configuring an Aggregated Ethernet Interface*
- *Ethernet Interfaces Feature Guide for Routing Devices*
- *Configuring Aggregated Ethernet Interfaces on PTX Series Packet Transport Routers*
- *Configuring Aggregated SONET/SDH Interfaces*





# Configuring Chassis Settings to Support Load Balancing

- [Configuring ECMP Next Hops for RSVP and LDP LSPs for Load Balancing on page 487](#)
- [Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 489](#)
- [Examples: Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs on MX Series Routers on page 491](#)

## Configuring ECMP Next Hops for RSVP and LDP LSPs for Load Balancing

---

The Junos OS supports configurations of 16, 32, or 64 equal-cost multipath (ECMP) next hops for RSVP and LDP LSPs on M10i routers with an Enhanced CFEB, M320, M120, MX Series, and T Series routers, and routing devices. For networks with high-volume traffic, this provides more flexibility to load-balance the traffic over as many as 64 LSPs.

To configure the maximum limit for ECMP next hops, include the **maximum-ecmp next-hops** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
maximum-ecmp next-hops;
```

You can configure a maximum ECMP next-hop limit of 16, 32, or 64 using this statement. The default limit is 16.



**NOTE:** MX Series routers with one or more Modular Port Concentrator (MPC) cards and with Junos OS 11.4 or earlier installed, support the configuration of the **maximum-ecmp** statement with only 16 next hops. You should *not* configure the **maximum-ecmp** statement with 32 or 64 next hops. When you commit the configuration with 32 or 64 next hops, the following warning message appears:

**Error: Number of members in Unilist NH exceeds the maximum supported 16 on Trio.**

The following types of routes support the ECMP maximum next-hop configuration for as many as 64 ECMP gateways:

- Static IPv4 and IPv6 routes with direct and indirect next-hop ECMPs
- LDP ingress and transit routes learned through associated IGP routes
- RSVP ECMP next hops created for LSPs
- OSPF IPv4 and IPv6 route ECMPs
- ISIS IPv4 and IPv6 route ECMPs
- EBGP IPv4 and IPv6 route ECMPs
- IBGP (resolving over IGP routes) IPv4 and IPv6 route ECMPs

The enhanced ECMP limit of up to 64 ECMP next hops is also applicable for Layer 3 VPNs, Layer 2 VPNs, Layer 2 circuits, and VPLS services that resolve over an MPLS route, because the available ECMP paths in the MPLS route can also be used by such traffic.



**NOTE:**

The following FPCs on M320, T640, and T1600 routers only support 16 ECMP next hops:

- (M320, T640, and T1600 routers only) Enhanced II FPC1
- (M320, T640, and T1600 routers only) Enhanced II FPC2
- (M320 and T640 routers only) Enhanced II FPC3
- (T640 and T1600 routers only) FPC2
- (T640 and T1600 routers only) FPC3

If a maximum ECMP next-hop limit of 32 or 64 is configured on an M320, T640, or T1600 router with any of these FPCs installed, the Packet Forwarding Engines on these FPCs use only the first 16 ECMP next hops. For Packet Forwarding Engines on FPCs that support only 16 ECMP next hops, the Junos OS generates a system log message if a maximum ECMP next-hop limit of 32 or 64 is configured. However, for Packet Forwarding Engines on other FPCs installed on the router, a maximum configured ECMP limit of 32 or 64 ECMP next hops is applicable.

---



**NOTE:** If RSVP LSPs are configured with bandwidth allocation, for ECMP next hops with more than 16 LSPs, traffic is not distributed optimally based on bandwidths configured. Some LSPs with smaller allocated bandwidths receive more traffic than the ones configured with higher bandwidths. Traffic distribution does not strictly comply with the configured bandwidth allocation. This caveat is applicable to the following routers:

- T1600 and T640 routers with Enhanced Scaling FPC1, Enhanced Scaling FPC2, Enhanced Scaling FPC3, Enhanced Scaling FPC 4, and all Type 4 FPCs
- M320 routers with Enhanced III FPC1, Enhanced III FPC2, and Enhanced III FPC3
- MX Series routers with all types of FPCs and DPCs, excluding MPCs. This caveat is not applicable to MX Series routers with line cards based on the Junos Trio chipset.
- M120 routers with Type 1, Type 2, and Type 3 FPCs
- M10i routers with Enhanced CFEB

Next-hop cloning and permutations are disabled on T Series routers with Enhanced Scaling FPCs (Enhanced Scaling FPC1, Enhanced Scaling FPC2, Enhanced Scaling FPC3, and Enhanced Scaling FPC 4) that support enhanced load-balancing capability. As a result, memory utilization is reduced for a highly scaled system with a high number of next hops on ECMP or aggregated interfaces. Next-hop cloning and permutations are also disabled on T Series routers with Type-4 FPCs.

To view the details of the ECMP next hops, issue the **show route** command. The **show route summary** command also shows the current configuration for the maximum ECMP limit. To view details of the ECMP LDP paths, issue the **traceroute mpls ldp** command.

Related Documentation

- [maximum-ecmp on page 701](#)

## Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers

Symmetrical hashing for load balancing on an 802.3ad Link Aggregation Group (LAG) is useful when two MX Series routers (for example, Router A and Router B) are connected transparently through Deep Packet Inspection (DPI) devices over a LAG bundle. The DPI devices keep track of traffic flows in both the forward and reverse directions.

If symmetrical hashing is configured, the reverse flow of traffic is also directed through the same child link on the LAG and is bound to flow through the same DPI device. This enables proper accounting on the DPI of the traffic in both the forward and reverse flows.

If symmetrical hashing is not configured, a different child link on the LAG might be chosen for the reverse flow of traffic through a different DPI device. This results in incomplete

information about the forward and reverse flows of traffic on the DPI device leading to incomplete accounting of the traffic by the DPI device.

Symmetrical hashing is computed based on fields like source address and destination address. You can configure symmetrical hashing both at the chassis level and the PIC level for load balancing based on Layer 2, Layer 3, and Layer 4 data unit fields for family inet (IPv4 protocol family) and multiservice (switch or bridge) traffic. Symmetrical hashing configured at the chassis level is applicable to the entire router, and is inherited by all its PICs and Packet Forwarding Engines. Configuring PIC-level symmetrical hashing provides you more granularity at the Packet Forwarding Engine level.

For the two routers connected through the DPI devices over a LAG bundle, you can configure **symmetric-hash** on one router and **symmetric-hash complement** on the remote-end router or vice-versa.

To configure symmetrical hashing at the chassis level, include the **symmetric-hash** or the **symmetric-hash complement** statements at the **[edit forwarding-options hash-key family]** hierarchy level. For information about configuring symmetrical hashing at the chassis level and configuring the link index, see the *Junos OS Network Interfaces Library for Routing Devices* and the *Junos OS VPNs Library for Routing Devices*.



**NOTE:** On MX Series DPCs, configuring symmetrical hashing at the PIC level refers to configuring symmetrical hashing at the Packet Forwarding Engine level.

To configure symmetrical hashing at the PIC level on the inbound traffic interface (where traffic enters the router), include the **symmetric-hash** or **symmetric-hash complement** statement at the **[edit chassis fpc slot-number pic pic-number hash-key]** hierarchy level:

```
[edit chassis fpc slot-number pic pic-number hash-key]
family multiservice {
  source-mac;
  destination-mac;
  payload {
    ip {
      layer-3 (source-ip-only | destination-ip-only);
      layer-4;
    }
  }
  symmetric-hash {
    complement;
  }
}
```

```
family inet {
  layer-3;
  layer-4;
  symmetric-hash {
    complement;
  }
}
```

}

**NOTE:**

- PIC-level symmetrical hashing overrides the chassis-level symmetrical hashing configured at the [edit chassis forwarding-options hash-key] hierarchy level.
- Symmetrical hashing for load balancing on 802.3ad Link Aggregation Groups is currently supported for the VPLS, INET and bridged traffic only.
- Hash key configuration on a PIC or Packet Forwarding Engine can be either in the “symmetric hash” or the “symmetric hash complement” mode, but not both at the same time.

**Related Documentation**

- [Examples: Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs on MX Series Routers on page 491](#)
- [family on page 647](#)
- [hash-key on page 672](#)
- [inet on page 678](#)
- [multiservice on page 714](#)
- [payload on page 729](#)
- [symmetric-hash on page 790](#)

## Examples: Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs on MX Series Routers



**NOTE:** These examples are applicable only to the DPCs Supported on MX240, MX480, and MX960 Routers. For the list of DPCs supported, see *DPCs Supported on MX240, MX480, and MX960 Routers* in the Related Documentation section.

The following examples show how to configure symmetrical hashing at the PIC level for load balancing on MX Series routers:

- [Configuring Symmetrical Hashing for family multiservice on Both Routers on page 492](#)
- [Configuring Symmetrical Hashing for family inet on Both Routers on page 492](#)
- [Configuring Symmetrical Hashing for family inet and family multiservice on the Two Routers on page 493](#)

## Configuring Symmetrical Hashing for family multiservice on Both Routers

On the inbound traffic interface where traffic enters Router A, include the **symmetric-hash** statement at the **[edit chassis fpc slot-number pic pic-number hash-key family multiservice]** hierarchy level:

```
[edit chassis fpc 2 pic 2 hash-key]
family multiservice {
  source-mac;
  destination-mac;
  payload {
    ip {
      layer-3;
      layer-4;
    }
  }
  symmetric-hash;
}
```

On the inbound traffic interface where traffic enters Router B, include the **symmetric-hash complement** statement at the **[edit chassis fpc slot-number pic pic-number hash-key family multiservice]** hierarchy level:

```
[edit chassis fpc 0 pic 3 hash-key]
family multiservice {
  source-mac;
  destination-mac;
  payload {
    ip {
      layer-3;
      layer-4;
    }
  }
  symmetric-hash {
    complement;
  }
}
```

## Configuring Symmetrical Hashing for family inet on Both Routers

On the inbound traffic interface where traffic enters Router A, include the **symmetric-hash** statement at the **[edit chassis fpc slot-number pic pic-number hash-key family inet]** hierarchy level:

```
[edit chassis fpc 0 pic 1 hash-key]
family inet {
  layer-3;
  layer-4;
  symmetric-hash;
}
```

On the inbound traffic interface where traffic enters Router B, include the **symmetric-hash complement** statement at the **[edit chassis fpc slot-number pic pic-number hash-key family inet]** hierarchy level:

```
[edit chassis fpc 1 pic 2 hash-key]
family inet {
  layer-3;
  layer-4;
  symmetric-hash {
    complement;
  }
}
```

### Configuring Symmetrical Hashing for family inet and family multiservice on the Two Routers

On the inbound traffic interface where traffic enters Router A, include the **symmetric-hash** statement at the **[edit chassis fpc slot-number pic pic-number hash-key family multiservice]** hierarchy level:

```
[edit chassis fpc 1 pic 0 hash-key]
family multiservice {
  payload {
    ip {
      layer-3;
      layer-4;
    }
  }
  symmetric-hash;
}
```

On the inbound traffic interface where traffic enters Router B, include the **symmetric-hash complement** statement at the **[edit chassis fpc slot-number pic pic-number hash-key family inet]** hierarchy level:

```
[edit chassis fpc 0 pic 3 hash-key]
family inet {
  layer-3;
  layer-4;
  symmetric-hash {
    complement;
  }
}
```

#### Related Documentation

- [Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 489](#)
- *DPCs Supported on MX240, MX480, and MX960 Routers*





# Configuring Chassis Settings to Support Channelized Interfaces

- [Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 495](#)
- [Ranges for Channelized DS3-to-DS0 Configuration on page 496](#)
- [Configuring the Junos OS to Support Channelized STM1 Interface Virtual Tributary Mapping on page 497](#)
- [Configuring the Junos OS to Enable Channelization on DS3/E3 MIC on page 497](#)

## Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots

---

You can configure 28 T1 channels per T3 interface. Each T1 link can have up to eight channel groups, and each channel group can hold any combination of DS0 time slots. To specify the T1 link and DS0 channel group number in the name, use colons (:) as separators. For example, a Channelized DS3-to-DS0 PIC might have the following physical and virtual interfaces:

```
ds-0/0/0:x:y
```

where *x* is a T1 link ranging from 0 through 27 and *y* is a DS0 channel group ranging from 0 through 7. (See [Table 72 on page 497](#) for more information about ranges.)

You can use any of the values within the range available for *x* and *y*; you do not have to configure the links sequentially. The software applies the interface options you configure according to the following rules:

- You can configure **t3-options** for **t1** link 0 and channel group 0 only; for example, **ds-0/0/0:0:0**.
- You can configure **t1-options** for any **t1** link value, but only for channel group 0; for example, **ds-0/0/0:x:0**.
- There are no restrictions on changing the default **ds0-options**.
- If you delete a configuration you previously committed for channel group 0, the options return to the default values.

To configure the channel groups and time slots for a channelized DS3 interface, include the **channel-group** and **timeslots** statements at the `[edit chassis fpc slot-number pic pic-number ct3 port port-number t1 link-number]` hierarchy level:

```
[edit chassis fpc slot-number pic pic-number ct3 port port-number t1 link-number]
channel-group channel-number timeslots slot-number;
```



**NOTE:** If you commit the interface name but do not include the `[edit chassis]` configuration, the Channelized DS3-to-DS0 PIC behaves like a Channelized DS3-to-DS1 PIC: none of the DS0 functionality is accessible.



**NOTE:** The FPC slot range depends on the platform. The maximum range of 0 through 7 applies to M40 routers; for M20 routers, the range is 0 through 3; for M10 routers the range is 0 through 1; for M5 routers, the only applicable value is 0. The Multichannel DS3 (Channelized DS3-to-DS0) PIC is not supported on M160 routers.

Bandwidth limitations restrict the interface to a maximum of 128 channel groups per T3 port, rather than the theoretical maximum of  $8 \times 28 = 224$ .

There are 24 time slots on a T1 interface. You can designate any combination of time slots for usage, but you can use each time slot number on only one channel group within the same T1 link.

To use time slots 1 through 10, designate **slot-number** as in this example:

```
[edit chassis fpc 0 pic 1 ct3 port 5 t1 22]
channel-group 7 timeslots 1-10;
```

To use time slots 1 through 5, time slot 10, and time slot 24, designate **slot-number** as in this example:

```
[edit chassis fpc 2 pic pic-number1 ct3 port 0 t1 8]
channel-group 4 timeslots 1-5,10,24;
```

Do not include spaces in the list of time slot numbers.

#### Related Documentation

- [Ranges for Channelized DS3-to-DS0 Configuration on page 496](#)

## Ranges for Channelized DS3-to-DS0 Configuration

Table 72 on page 497 shows the ranges for each of the quantities in the preceding configuration.

Table 72: Ranges for Channelized DS3-to-DS0 Configuration

Item	Variable	Range
FPC slot	<i>slot-number</i>	0 through 7 (see note below)
PIC slot	<i>pic-number</i>	0 through 3
Port	<i>port-number</i>	0 through 1
T1 link	<i>link-number</i>	0 through 27
DS0 channel group	<i>group-number</i>	0 through 7
time slot	<i>slot-number</i>	1 through 24

- Related Documentation**
- [Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 495](#)

## Configuring the Junos OS to Support Channelized STM1 Interface Virtual Tributary Mapping

By default, virtual tributary mapping uses KLM mode. You can configure virtual tributary mapping to use KLM or ITU-T mode. On the original Channelized STM1 PIC, to configure virtual tributary mapping, include the **vtmapping** statement at the **[edit chassis fpc slot-number pic pic-number]** hierarchy level:

```
[edit chassis fpc slot-number pic pic-number]
  vtmapping (klm | itu-t);
```

For the Channelized STM1 PIC with IQ, you can configure virtual tributary mapping by including the **vtmapping** statement at the **[edit interfaces cau4 fpc slot-number pic pic-number sonet-options]** hierarchy level.

- Related Documentation**
- [Configuring the Junos OS to Support the Sparse DLCI Mode on Channelized STM1 or Channelized DS3 PICs on page 466](#)
  - [Configuring Virtual Tributary Mapping of Channelized STM1 Interfaces](#)

## Configuring the Junos OS to Enable Channelization on DS3/E3 MIC

By default, the DS3/E3 MIC functions in clear-channel mode. To enable the DS3/E3 MIC to function in channelized mode, you need to use the software license S-MIC-3D-8CHDS3. To enable channelization, set the **channelization** statement at the **[edit chassis fpc MPC-slot-number pic MIC-slot-number]** hierarchy level. You can use the **channelization** option to channelize only individual DS3 interfaces.

**NOTE:**

- You can configure the **channelization** statement to enable channelization for the DS3/E3 MIC only. Moreover, you can use the **channelization** statement only on MX Series routers with Queuing and Enhanced Queuing MPCs (MX-MPC1-3D-Q, MX-MPC2-3D-Q, and MX-MPC2-3D-EQ) or on MX80 routers. Configuring the **channelization** statement on other MPCs does not have any effect, and the MICs continue to operate in clear-channel mode.
- Only clear-channel E3 mode is supported on the DS3/E3 MIC. Therefore, configuring the **channelization** statement does not impact the E3 functionality.

To configure channelization on the DS3/E3 MIC:

1. At the **[edit chassis]** hierarchy level in configuration mode, navigate to the hierarchy level that indicates the slot on which the DS3/E3 MIC is located.

```
[edit chassis]
user@host# edit fpc MPC-slot-number pic MIC-slot-number
```

For example, to navigate to the **[edit chassis fpc 1 pic 2]** hierarchy level:

```
[edit chassis]
user@host# edit fpc 1 pic 2
```

2. Configure the **channelization** statement.

```
[edit chassis fpc MPC-slot-number pic MIC-slot-number]
user@host# set channelization
```

For example:

```
[edit chassis fpc 1 pic 2]
user@host# set channelization
```

3. Verify the configuration by using the **show** command at the **[edit chassis]** hierarchy level:

```
[edit chassis]
user@host# show
fpc 1 {
  pic 2 {
    channelization;
  }
}
```

To enable the DS3/E3 MIC to function in clear-channel mode, you need to disable channelization. To do this, delete the **channelization** option at the **[chassis fpc MPC-slot-number pic MIC-slot-number]** hierarchy level.

To disable channelization on the DS3/E3 MIC:

1. At the **[edit chassis]** hierarchy level in configuration mode, navigate to the hierarchy level that indicates the slot on which the DS3/E3 MIC is located.

```
[edit chassis]
user@host# edit fpc MPC-slot-number pic MIC-slot-number
```

For example:

```
[edit chassis]
user@host# edit fpc 1 pic 2
```

2. Delete the **channelization** statement.

```
[edit chassis fpc MPC-slot-number pic MIC-slot-number]
user@host# delete channelization
```

For example:

```
[edit chassis fpc 1 pic 2]
user@host# delete channelization
```

Related Documentation • [channelization on page 611](#)



# Configuring Chassis Settings to Support ATM Devices

- [Configuring the Junos OS to Enable ATM2 Intelligent Queuing Layer 2 Circuit Transport Mode on page 501](#)
- [Configuring the Junos OS to Enable Idle Cell Format and Payload Patterns for ATM Devices on page 502](#)

## Configuring the Junos OS to Enable ATM2 Intelligent Queuing Layer 2 Circuit Transport Mode

---

On ATM2 IQ PICs only, you can configure Layer 2 circuit cell relay, Layer 2 circuit ATM Adaptation Layer 5 (AAL5), or Layer 2 circuit trunk mode.

Layer 2 circuit cell relay and Layer 2 circuit AAL5 are defined in the Internet draft *draft-martini-l2circuit-encap-mpls-04.txt*, *Encapsulation Methods for Transport of Layer 2 Frames Over IP and MPLS Networks*.

Layer 2 circuit trunk mode allows you to send ATM cells over Multiprotocol Label Switching (MPLS) trunking.

The four transport modes are defined as follows:

- To tunnel IP packets over an ATM backbone, use the default standard AAL5 transport mode.
- To tunnel a stream of AAL5-encoded ATM segmentation-and-reassembly protocol data units (SAR-PDUs) over an MPLS or IP backbone, use Layer 2 circuit AAL5 transport mode.
- To tunnel a stream of ATM cells over an MPLS or IP backbone, use Layer 2 circuit cell-relay transport mode.
- To transport ATM cells over an MPLS core network that is implemented on some other vendor switches, use Layer 2 circuit trunk mode.



**NOTE:** You can transport AAL5-encoded traffic with Layer 2 circuit cell-relay transport mode, because Layer 2 circuit cell-relay transport mode ignores the encoding of the cell data presented to the ingress interface.

When you configure AAL5 mode Layer 2 circuits, the control word carries cell loss priority (CLP) information by default.

By default, ATM2 IQ PICs are in standard AAL5 transport mode. Standard AAL5 allows multiple applications to tunnel the protocol data units of their Layer 2 protocols over an ATM virtual circuit. To configure the Layer 2 circuit transport modes, include the **atm-l2circuit-mode** statement at the **[edit chassis fpc slot-number pic pic-number]** hierarchy level:

```
[edit chassis fpc slot-number pic pic-number]
atm-l2circuit-mode (cell | aal5 | trunk trunk);
```

On a TX Matrix or TX Matrix Plus router, include the **atm-l2circuit-mode** statement at the **[edit chassis lcc number fpc slot-number pic pic-number]** hierarchy level:

```
[edit chassis lcc number fpc slot-number pic pic-number]
atm-l2circuit-mode (cell | aal5 | trunk trunk);
```

**aal5** tunnels a stream of AAL5-encoded ATM cells over an IP backbone.

**cell** tunnels a stream of ATM cells over an IP backbone.

**trunk** transports ATM cells over an MPLS core network that is implemented on some other vendor switches. Trunk mode can be user-to-network interface (UNI) or network-to-network interface (NNI).



**NOTE:** To determine which vendors support Layer 2 circuit trunk mode, contact Juniper Networks customer support.

---

**Related  
Documentation**

- [Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC on page 471](#)
- [Configuring the Junos OS to Enable Idle Cell Format and Payload Patterns for ATM Devices on page 502](#)
- [Configuring the Junos OS to Use ATM Cell-Relay Accumulation Mode on an ATM1 PIC on page 466](#)

---

## Configuring the Junos OS to Enable Idle Cell Format and Payload Patterns for ATM Devices

---

ATM devices send idle cells to enable the receiving ATM interface to recognize the start of each new cell. The receiving ATM device does not act on the contents of idle cells and does not pass them up to the ATM layer in the ATM protocol stack.

By default, the idle cell format for ATM cells is (4 bytes): 0x00000000. For ATM 2 PICs and ATM MICs, you can configure the format of the idle cell header and payload bytes.



To configure the idle cell header to use the International Telecommunications Union (ITU-T) standard of 0x00000001, include the **itu-t** statement at the **[edit chassis fpc slot-number pic pic-number idle-cell-format]** hierarchy level:

```
[edit chassis fpc slot-number pic pic-number idle-cell-format]
itu-t;
```

On a TX Matrix or TX Matrix Plus router, include the **itu-t** statement at the **[edit chassis lcc number fpc slot-number pic pic-number idle-cell-format]** hierarchy level:

```
[edit chassis lcc number fpc slot-number pic pic-number idle-cell-format]
itu-t;
```

By default, the payload pattern is cell payload (48 bytes). To configure the idle cell payload pattern, include the **payload-pattern** statement at the **[edit chassis fpc slot-number pic pic-number idle-cell-format]** hierarchy level:

```
[edit chassis fpc slot-number pic pic-number idle-cell-format]
payload-pattern payload-pattern-byte;
```

On a TX Matrix router, include the **payload-pattern** statement at the **[edit chassis lcc number fpc slot-number pic pic-number idle-cell-format]** hierarchy level:

```
[edit chassis lcc number fpc slot-number pic pic-number idle-cell-format]
payload-pattern payload-pattern-byte;
```

The payload pattern byte can range from **0x00** through **0xff**.

For information about the TX Matrix router, see [“TX Matrix Router and T640 Router Configuration Overview” on page 373](#). For information about the TX Matrix Plus router, see [“TX Matrix Plus Router Configuration Overview” on page 397](#).

#### Related Documentation

- [Configuring the Junos OS to Use ATM Cell-Relay Accumulation Mode on an ATM1 PIC on page 466](#)
- [Configuring the Junos OS to Enable ATM2 Intelligent Queuing Layer 2 Circuit Transport Mode on page 501](#)
- [Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC on page 471](#)
- [Configuring Layer 2 Circuit Transport Mode on ATM MICs](#)
- [Example: Configuring Layer 2 Circuit Transport Mode on ATM MICs](#)



## CHAPTER 22

# Configuring Chassis Settings for Routing Engines and Packet Forwarding Engines

- [Configuring the Junos OS to Support Redundancy on Routers Having Multiple Routing Engines or Switching Boards on page 505](#)
- [Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels on page 506](#)
- [Configuring the Junos OS to Enable a Routing Engine to Reboot on Hard Disk Errors on page 509](#)
- [Associating Sampling Instances for Active Flow Monitoring with a Specific FPC, MPC, or DPC on page 509](#)
- [Configuring a Policer Overhead on page 510](#)
- [Configuring Sanity Polling on page 511](#)
- [Configuring Slow Packet Forwarding Engine Alarm on page 514](#)

## Configuring the Junos OS to Support Redundancy on Routers Having Multiple Routing Engines or Switching Boards

---

For routers that have multiple Routing Engines or these multiple switching control boards: Switching and Forwarding Modules (SFMs), System and Switch Boards (SSBs), Forwarding Engine Boards (FEBs), or Compact Forwarding Engine Boards (CFEBs), you can configure redundancy properties.

To configure redundancy, include the following redundancy statements at the **[edit chassis]** hierarchy level:

```
redundancy {
  cfeb slot (always | preferred);
  failover {
    on-disk-failure
    on-loss-of-keepalives;
  }
  feb {
    redundancy-group group-name {
      feb slot-number (backup | primary);
      description description;
      no-auto-failover;
    }
  }
}
```

```

    }
  }
  graceful-switchover;
  keepalive-time seconds;
  routing-engine slot-number (master | backup | disabled);
  sfm slot-number (always | preferred);
  ssb slot-number (always | preferred);
}

```

**Related Documentation**

- [Understanding Routing Engine Redundancy on Juniper Networks Routers](#)

## Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels

The jtree memory on all MX Series, all M120, and some M320, M10i, M7i, T640, T1600, TX Matrix, TX Matrix Plus router Packet Forwarding Engines has two segments: one segment primarily stores routing tables and related information, and the other mainly stores firewall-filter-related information.

The Junos OS provides the **memory-enhanced** statement to reallocate the jtree memory for routes, firewall filters, and Layer 3 VPNs. The statement has the following options:

- **filter**—Include this statement when you want to support larger firewall filters over routing tables. However, we recommend enabling this option only if you do not have a very large routing table configuration.

To allocate more memory for firewall filters, include the **filter** statement at the **[edit chassis memory-enhanced]** hierarchy level:

```
[edit chassis memory-enhanced]
filter;
```

- **route**—Include this statement when you want to support larger routing tables (with more routes) over firewall filters. For example, you can enable this option, when you want to support a large number of routes for Layer 3 VPNs implemented using MPLS. However, we recommend enabling this option only if you do not have a very large firewall configuration.

To allocate more memory for routing tables, include the **route** statement at the **[edit chassis memory-enhanced]** hierarchy level:

```
[edit chassis memory-enhanced]
route;
```

- **vpn-label**—Include this statement when you want to enhance memory to support a larger number of Layer 3 VPN labels.

Layer 3 VPN composite next hops can be enabled by including the **l3vpn-composite-nexthop** statement at the **[edit routing-options]** and **[edit logical-systems logical-system-name routing-options]** hierarchy levels. This statement enables BGP to accept larger numbers of Layer 3 VPN BGP updates with unique inner

VPN labels. Including the **l3vpn-composite-nexthop** in the configuration enhances scaling and convergence performance of PE routers participating in a Layer 3 VPN in a multivendor environment. For more information on configuring the **l3vpn-composite-nexthop** statement, see the *Junos OS VPNs Library for Routing Devices*.

To allocate more memory to support a larger number of Layer 3 VPN labels accepted by the **l3vpn-composite-nexthop** statement, include the **vpn-label** statement at the **[edit chassis memory-enhanced]** hierarchy level:

```
[edit chassis memory-enhanced]  
vpn-label;
```

The **memory-enhanced vpn-label** statement increases the size of the fabric next-hop table, which is held on the egress FPC in the jtree, from the default value of 128,000 entries to 1,000,000 entries. This improves token fabric scaling, at the expense of additional segment 1 usage. This functionality is not applicable to MX Series, or M320 platforms, as these platforms provide for flexibly sized fabric token tables by default. This means that the **memory-enhanced route** statement is applicable to T Series platforms and that you can configure both **memory-enhanced vpn-label** and **memory-enhanced route** on T Series platforms when their combined functionality is desired.

You can configure the **memory-enhanced** statement on the following routers:

- M10i and M7i routers with Enhanced CFEB
- M320 routers with Enhanced III FPC1, Enhanced III FPC2, and Enhanced III FPC3
- M120 routers
- MX Series routers with DPC (I-chip based) line cards
- T Series (T640, T1600, TX Matrix, and TX Matrix Plus) routers with Enhanced Scaling FPC1, Enhanced Scaling FPC2, Enhanced Scaling FPC3, and Enhanced Scaling FPC4.

**NOTE:**

- The following hardware is not supported for the TXP-T1600 configuration for Junos OS Release 10.0 and earlier releases. If you plan to run a release prior to Junos OS Release 10.0, you must remove the following FPCs and any PICs that require these FPCs prior to integrating the LCC into the routing matrix:
  - All type 1 FPCs
  - All type 2 FPCs
  - T640 Enhanced Scaling FPC4-1P FPCs
- The following hardware is not supported for the TXP-T1600-3D or TXP-Mixed-LCC-3D configuration:
  - T640-FPC1-E and T640-FPC1-E2
  - T640-FPC2, T640-FPC2-E, and T640-FPC2-E2
  - T640-FPC3, T640-FPC3-E, and T640-FPC3-E2

As the allocation of more memory for routing tables or firewall filters might disrupt the forwarding operations of a Packet Forwarding Engine, the Junos OS CLI displays a warning to restart all affected FPCs when you commit a configuration that includes the **memory-enhanced route** statement. The configuration does not become effective until you restart the FPC or DPC (on MX Series routers).

To restart a single FPC or DPC without rebooting the entire router, issue the **request chassis fpc slot slot-number restart** command. On an M120 router, issue the **request chassis feb slot slot-number restart** command.

To view if the configuration is active on an FPC or DPC, issue the **show pfe fpc slot-number** command.

**NOTE:**

- For T Series routers only. With Junos OS Release 10.2, enhanced jtree memory allocation is disabled by default. For Junos OS Releases 9.3 through 10.1, the default routing tables (inet.0 and inet6.0) use both memory segments by default.
- In Junos OS Release 11.2 and later, the **memory-enhanced route** statement at the [edit chassis] hierarchy level replaces the **route-memory-enhanced** statement at the [edit chassis] hierarchy level.
- The **filter** and **vpn-label** statements are supported only on T Series routers.

Related Documentation

- [memory-enhanced on page 708](#)
- [filter on page 651](#)

- [route \(chassis\) on page 766](#)
- [vpn-label on page 824](#)
- *Overview of a Routing Matrix with a TX Matrix Plus Router*

## Configuring the Junos OS to Enable a Routing Engine to Reboot on Hard Disk Errors

When a hard disk error occurs, a Routing Engine might enter a state in which it responds to local pings and interfaces remain up, but no other processes are responding.

To recover from this situation, you can configure a single Routing Engine to reboot automatically when a hard disk error occurs. To enable this feature, include the **on-disk-failure reboot** statement at the **[edit chassis routing-engine]** hierarchy level.

```
[edit chassis routing-engine]
on-disk-failure {
  disk-failure-action (halt | reboot);
}
```

For dual Routing Engine environments, you can configure a backup Routing Engine to assume mastership automatically, if it detects a hard disk error on the master Routing Engine. To enable this feature, include the **on-disk-failure** statement at the **[edit chassis redundancy failover]** hierarchy level. For information about this statement, see the *High Availability Feature Guide*.

You can configure the Routing Engine to halt (instead of rebooting) when the hard disk fails on the Routing Engine. To configure this feature, include the **disk-failure-action (halt | reboot)** statement at the **[edit chassis routing-engine on-disk-failure]** hierarchy level:

```
[edit chassis routing-engine]
on-disk-failure {
  disk-failure-action (halt | reboot);
}
```

Use the **halt** option to configure the Routing Engine to halt when the hard disk fails. Use the **reboot** option to configure the Routing Engine to reboot when the hard disk fails.

### Related Documentation

- [Configuring Automatic Mirroring of the CompactFlash Card on the Hard Disk Drive](#)

## Associating Sampling Instances for Active Flow Monitoring with a Specific FPC, MPC, or DPC

The Junos OS enables you to configure sampling instances for active flow monitoring, by specifying a name for the sampling parameters and associating the instance name with a specific FPC, MPC, or DPC.

To configure active sampling instances, include the **instance** statement at the **[edit forwarding-options sampling]** hierarchy level. For more information about configuring sampling instances, see the *Junos OS Services Interfaces Library for Routing Devices*.

To associate a configured active sampling instance with a specific FPC, MPC, or DPC, include the sampling instance name at the **[edit chassis fpc slot-number]** hierarchy level:

```
[edit chassis fpc slot-number]
sampling-instance instance-name;
```

On a TX Matrix, TX Matrix Plus router, include the **sampling-instance** statement at the **[edit chassis lcc number fpc slot-number]** hierarchy level:

```
[edit chassis lcc number fpc slot-number]
sampling-instance instance-name;
```

**Related  
Documentation**

- *Example: Sampling Instance Configuration on an MX480 Router*
- [sampling-instance on page 769](#)

---

## Configuring a Policer Overhead

Configuring a policer overhead allows you to control the rate of traffic sent or received on an interface. When you configure a policer overhead, the configured policer overhead value (bytes) is added to the length of the final Ethernet frame. This calculated length of frame is used to determine the policer or the rate limit action. Therefore, the policer overhead enables you to control the rate of traffic sent or received on an interface. You can configure the policer overhead to rate-limit queues and Layer 2 and MAC policers. The policer overhead and the shaping overhead can be configured simultaneously on an interface.

This feature is supported on M Series and T Series routers with IQ2 PICs or IQ2E PICs, and on MX Series DPCs.

To configure a policer overhead for controlling the rate of traffic sent or received on an interface:

1. In the **[edit chassis]** hierarchy level in configuration mode, create the interface on which to add the policer overhead to input or output traffic.

```
[edit chassis]
user@host# edit fpc fpc pic pic
```

For example:

```
[edit chassis]
user@host# edit fpc 0 pic 1
```

2. Configure the policer overhead to control the input or output traffic on the interface. You could use either statement or both the statements for this configuration.



```
[edit chassis fpc fpc pic pic]
user@host# set ingress-policer-overhead bytes;
user@host# set egress-policer-overhead bytes;
```

For example:

```
[edit chassis fpc 0 pic 1]
user@host# set ingress-policer-overhead 10;
user@host# set egress-policer-overhead 20;
```

### 3. Verify the configuration:

```
[edit chassis]
user@host# show
fpc 0 {
  pic 1 {
    ingress-policer-overhead 10;
    egress-policer-overhead 20;
  }
}
```



**NOTE:** When the configuration for the policer overhead bytes on a PIC is changed, the PIC goes offline and then comes back online. In addition, the configuration in the CLI is on a per-PIC basis and, therefore, applies to all the ports on the PIC.

#### Related Documentation

- [egress-policer-overhead on page 638](#)
- [ingress-policer-overhead on page 679](#)

## Configuring Sanity Polling

You can configure the **sanity-poll** statement for a particular FPC or FEB or CFEB to start a periodic sanity check for that FPC or FEB or CFEB. The periodic sanity check includes checking for error conditions such as “register sanity issues,” “high temperature,” “hardware failure,” and so on. If you do not configure the **sanity-poll** statement, then sanity polling is disabled.



**NOTE:** Currently, periodic sanity check is performed only on the routing chip register.

Sanity polling periodically checks for an error condition in an FPC or FEB or CFEB and performs the appropriate actions in case of an error.

- To configure sanity polling for an FPC on T Series routers and M320 routers, include the **sanity-poll** statement and its substatements at the **[edit chassis fpc slot-number]** hierarchy level:

```
[edit chassis]
fpc slot-number {
  sanity-poll {
    retry-count number;
    on-error {
      raise-alarm;
      power (cycle | off);
      write-coredump;
    }
  }
}
```

- To configure sanity polling for a FEB on the M120 router, include the **sanity-poll** statement and its substatements at the **[edit chassis feb slot-number]** hierarchy level:

```
[edit chassis]
feb slot-number {
  sanity-poll {
    retry-count number;
    on-error {
      raise-alarm;
      power (cycle | off);
      write-coredump;
    }
  }
}
```

- To configure sanity polling for a CFEB on M7i and M10 routers, include the **sanity-poll** statement and its substatements at the **[edit chassis cfeb slot-number]** hierarchy level:

```
[edit chassis]
cfcb slot-number {
  sanity-poll {
    retry-count number;
    on-error {
      raise-alarm;
      power (cycle | off);
      write-coredump;
    }
  }
}
```



**NOTE:** On a TX Matrix or TX Matrix Plus router, you can configure the **sanity-poll** statement at the **[edit chassis lcc number fpc number]** hierarchy level.

The **sanity-poll** statement comprises the following substatements:

- The **retry-count** statement specifies the number of rechecks to be performed after the occurrence of a particular error condition. If an error exists in all the periodic checks, then sanity polling reports an error and proceeds to perform the appropriate actions (described as options of the **on-error** statement).

For example, if the periodic sanity check detects an error in the FPC or FEB or CFEB and if you configure the **retry count number** to 15, sanity polling does not report the error immediately. Sanity polling checks 15 times for the same error condition. If an error persists in all 15 rechecks, then it reports an error and takes the appropriate actions.

If you do not configure the **retry-count** statement, then by default, the **sanity-poll** statement rechecks the detected error 10 times before reporting an error condition.

- If sanity polling detects an error condition, the **on-error** statement performs the appropriate actions to eliminate the error.

The following actions are common to all kinds of error conditions:

- To generate a chassis alarm, configure the **raise-alarm** statement. The chassis alarm is displayed in the front panel of the chassis.
- To reboot the FPC or FEB or CFEB after generating a core file, configure the **power cycle** statement. This statement is useful for temporary software errors that are eliminated after reboot.
- To halt the FPC or FEB or CFEB, configure the **power off** statement. This statement is useful in case of permanent hardware failure.



**CAUTION:** The **power off** statement halts the FPC. Ensure that you have backup paths through a different FPC or FEB or CFEB to avoid service outage.



**NOTE:** The **power cycle** and **power off** statements are mutually exclusive: You can configure either the **power cycle** or the **power off** action for an error.

- To trigger the core file, configure the **write-coredump** statement.

You can configure multiple actions for a given FPC or FEB or CFEB. If you do not configure any actions, the **sanity-poll** statement generates only FPC or FEB or CFEB system log messages.

#### Related Documentation

- [sanity-poll on page 770](#)
- [retry-count on page 765](#)
- [on-error on page 724](#)

## Configuring Slow Packet Forwarding Engine Alarm

On an M Series, an MX Series, a T Series, or a SRX Series router, the Packet Forwarding Engine might not send a resource acknowledgment message to the Routing Engine within a predetermined time of 360 seconds. This delay in receiving resource acknowledgment could be due to a slow or stuck Packet Forwarding Engine on the M Series, MX Series, T Series, or SRX Series router, or on one of the LCCs connected to a TX Matrix, TX Matrix Plus, or TX Matrix Plus router with 3D SIBs.

Starting with Junos OS Release 13.2R1 (also applicable in Junos OS Releases 12.1R6, 12.2R5, 12.3R3, 13.1R2 and later), to display the issue as an alarm in the **show chassis alarms** command output and to append the alarm to the system log messages file, you must enable the slow Packet Forwarding Engine alarm on the router.

The following sections provide more information about the slow Packet Forwarding Engine alarm:

- [Enabling Slow Packet Forwarding Engine Alarm on page 514](#)
- [Disabling Slow Packet Forwarding Engine Alarm on page 514](#)
- [Verifying That the Alarm Output and System Log Messages are Updated on page 515](#)

### Enabling Slow Packet Forwarding Engine Alarm

To enable the slow Packet Forwarding Engine alarm, perform the following steps:



**NOTE:** By default, the slow Packet Forwarding Engine alarm is disabled.

1. In configuration mode, go to the **[edit chassis]** hierarchy level:

```
[edit]
user@host# edit chassis
```

2. Enable the slow Packet Forwarding Engine alarm by configuring the **slow-pfe-alarm** statement.

```
[edit chassis]
user@host# set slow-pfe-alarm
```

### Disabling Slow Packet Forwarding Engine Alarm

To disable the slow Packet Forwarding Engine alarm, perform the following steps:

1. In configuration mode, go to the **[edit chassis]** hierarchy level:

```
[edit]
user@host# edit chassis
```

2. Disable the slow Packet Forwarding Engine alarm by deleting the **slow-pfe-alarm** statement.

```
[edit chassis]
user@host# delete slow-pfe-alarm
```

## Verifying That the Alarm Output and System Log Messages are Updated

**Purpose** To verify that the output of the **show chassis alarms** operational mode command and the system log messages file are updated with the slow Packet Forwarding Engine alarm when:

- The **slow-pfe-alarm** statement is enabled in the **[edit chassis]** hierarchy.
- The Packet Forwarding Engine resource acknowledgment is not received by the Routing Engine within a predetermined time of 360 seconds.

**Action** To check the output on an M Series, MX Series, T Series, or a SRX Series router:

1. Verify that the alarm is displayed in the output of the **show chassis alarms** operational mode command.

```
user@host> show chassis alarms

1 alarms currently active
Alarm time           Class  Description
2013-02-05 01:12:33 PST  Minor  Potential slow peers are: XDPC2
```

For field descriptions, see [show chassis alarms](#).

2. Verify that the alarm is appended to the system log messages file.

```
/var/log/messages -
... Alarm set: RE color=YELLOW, class=CHASSIS, reason=Potential slow peers
are: XDPC2
... Minor alarm set, Potential slow peers are: XDPC2
```

To check the output on a TX Matrix, TX Matrix Plus, or a TX Matrix Plus with 3D SIBs router:

1. Verify that the alarm is displayed in the output of the **show chassis alarms** operational mode command.

```
user@scc> show chassis alarms

scc-re0:
-----
9 alarms currently active
Alarm time           Class  Description
2013-02-06 00:45:46 PST  Minor  Potential slow peers are: LCC1 LCC0
...
lcc0-re0:
```

```

-----
4 alarms currently active
Alarm time          Class  Description
2013-02-06 00:44:51 PST  Minor Potential slow peers are: GFPC4 GFPC3
...
lcc1-re0:
-----
4 alarms currently active
Alarm time          Class  Description
2013-02-06 00:45:44 PST  Minor Potential slow peers are: GFPC10
...
lcc2-re0:
-----
No alarms currently active
lcc3-re0:
-----
No alarms currently active

```

For field descriptions, see [show chassis alarms](#).

2. Verify that the alarm is appended to the system log messages file.

```

... Alarm set: RE color=YELLOW, class=CHASSIS, reason=Potential slow peers
are: LCC0 LCC1
... Minor alarm set, Potential slow peers are: LCC0
... Alarm set: RE color=YELLOW, class=CHASSIS, reason=Potential slow peers
are: GFPC4 GFPC3
... Minor alarm set, Potential slow peers are: GFPC4 GFPC3
... Alarm set: RE color=YELLOW, class=CHASSIS, reason=Potential slow peers
are: GFPC10
... Minor alarm set, Potential slow peers are: GFPC10

```

**Meaning** The output of **show chassis alarms** operational mode command and the system log messages file are updated as expected when the slow Packet Forwarding Engine alarm is enabled and when the Packet Forwarding Engine resource acknowledgment is not received by the Routing engine within a predetermined time of 360 seconds.

**Related Documentation**

- [slow-pfe-alarm on page 779](#)

## CHAPTER 23

# Configuring Chassis Settings for the Craft Interface

- [Configuring the Junos OS to Disable the Physical Operation of the Craft Interface on page 517](#)

## Configuring the Junos OS to Disable the Physical Operation of the Craft Interface

You can disable the physical operation of the craft interface front panel on the router. When you disable the operation of the craft interface, the buttons on the front panel, such as the alarm cutoff button, no longer function. To disable the craft interface operation, include the **craft-lockout** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]  
craft-lockout;
```

### Related Documentation

- [Configuring Junos OS to Determine Conditions That Trigger Alarms on Different Interface Types on page 571](#)
- [Silencing External Devices Connected to Alarm Relay Contacts on page 574](#)





# Configuring Chassis Settings for Alarms

- [User-Defined Alarm Relay Overview on page 519](#)
- [Configuring Chassis Alarm Relays on page 520](#)
- [Configuring Chassis Alarm Input on page 521](#)
- [Configuring Chassis Alarm Output on page 522](#)
- [Chassis Alarms on page 523](#)
- [Chassis Conditions That Trigger Alarms on page 530](#)
- [System Alarms on page 570](#)
- [System-Wide Alarms and Alarms for Each Interface Type on page 571](#)
- [Configuring Junos OS to Determine Conditions That Trigger Alarms on Different Interface Types on page 573](#)
- [Silencing External Devices Connected to Alarm Relay Contacts on page 574](#)

## User-Defined Alarm Relay Overview

---

The ACX Series router alarm contact port—labeled ALARM on the front panel—allows you to manage sensors and external devices connected to the router in remote unstaffed facilities.



**NOTE:** Alarm contact port is not applicable on ACX5048 and ACX5096 routers.

- [Alarm Contact Port on page 519](#)
- [Alarm Input on page 520](#)
- [Alarm Output on page 520](#)

## Alarm Contact Port

The ACX Series router alarm contact port is a 15-pin D-type dry contact connector for alarms. The alarm contact port is used to generate LED alarms on the router and to turn external devices on or off. You can connect up to four input alarms and two output alarms. The alarm setting is open or closed.

## Alarm Input

Alarm input provides dry contacts to connect to security sensors such as door or window monitors. The alarm input—open or closed—is sensed and reported to the management software. You can configure up to four alarm input relay ports (0 through 3) to operate as normally open or normally closed, and to trigger a red alarm condition or a yellow alarm condition or to ignore alarm conditions.

## Alarm Output

Alarm output provides dry contacts to connect to external equipment, such as an audible or visual alarm that switches on or off—for example, a bell or a light. The four alarm output relay ports—0 through 3—are set up as follows:

- Ports 0 and 1—These ports can be configured to trigger an alarm when the system temperature goes to the red alarm status and when an alarm input port is triggered.
- Ports 2 and 3—These ports are *not* configured. They are used to indicate system major and minor alarms and are normally open. When a condition triggers an alarm, an alarm message is displayed.

To view the alarm input and output relay information, issue the **show chassis craft-interface** command from the Junos OS command line interface.

### Related Documentation

- [Alarm Contact Port on the ACX2000 Router](#) (Hardware topic)
- [Configuring Chassis Alarm Relays on page 520](#)
- [Configuring Chassis Alarm Input on page 521](#)
- [Configuring Chassis Alarm Output on page 522](#)
- *relay (Chassis Alarm)*

---

## Configuring Chassis Alarm Relays

On ACX Series routers, you can configure alarm relays that can trigger alarms and turn external devices on or off. For example, if the router heats up to more than the critical temperature, the output port is activated and a device connected to the output port—such as a fan—is turned on.

To configure conditions that trigger alarms, include the **relay** statement with the **input** and **output** options at the **[edit chassis alarm]** hierarchy level.

```
[edit chassis alarm]
relay
  input {
    port port-number {
      mode (close | open);
      trigger (ignore | red | yellow);
    }
  }
```

```
output{
  port port-number {
    input-relay input-relay;
    mode (close | open);
    temperature;
  }
}
```

The following output shows an example configuration of a chassis relay alarm:

```
[edit chassis alarm]
user@host# show
relay {
  input {
    port 1 {
      mode close;
      trigger red;
    }
  }
  output {
    port 0 {
      temperature;
    }
  }
}
```

#### Related Documentation

- [User-Defined Alarm Relay Overview on page 519](#)
- [input](#)
- [output](#)
- [show chassis craft-interface on page 950](#)
- [show chassis alarms on page 925](#)

## Configuring Chassis Alarm Input

The ACX Series router alarm contact port—labeled ALARM on the front panel—allows you to manage sensors and external devices connected to the router in remote unstaffed facilities. You can configure up to four alarm input ports (0 through 3) to operate as normally open or normally closed, and to trigger a red alarm condition or a yellow alarm condition or to ignore alarm conditions.

To configure an input alarm:

1. Configure the input port:

```
[edit chassis alarm relay input port port-number]
```

For example, to configure input port zero (0):

```
user@host# edit chassis alarm relay input port 0
```

2. Configure the mode in which the input alarm is not active:

```
[edit chassis alarm relay input port port-number mode (close | open)]
```

For example, to configure open mode:

```
[edit chassis alarm relay input port 0]  
user@host# set mode open
```

3. Configure the trigger to set off the alarm:

```
[edit chassis alarm relay input port port-number trigger (ignore | red | yellow)]
```

For example, to set off the yellow alarm:

```
[edit chassis alarm relay input port 0]  
user@host# set trigger yellow
```

4. Verify the configuration with the **show** command:

```
[edit chassis alarm relay input port 0]  
user@host# show  
mode open;  
trigger yellow;
```

5. Commit the configuration with the **commit** command.

To view the alarm input relay information, issue the **show chassis alarms** or **show chassis craft-interface** commands from the Junos OS command line interface.

#### Related Documentation

- [User-Defined Alarm Relay Overview on page 519](#)
- *output*
- [show chassis craft-interface on page 950](#)
- [show chassis alarms on page 925](#)

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## Configuring Chassis Alarm Output

The ACX Series router alarm contact port—labeled ALARM on the front panel—allows you to manage sensors and external devices connected to the router in remote unstaffed facilities. You can configure up to two alarm output relay ports (0 and 1) to operate as normally open or normally closed, and to trigger an alarm when the system temperature goes to the red alarm status and when an alarm input port is triggered.



**NOTE:** Ports 2 and 3 are *not* configured. They are used to indicate system major and minor alarms and are normally open. When a condition triggers an alarm, an alarm message is displayed, and the corresponding LED turns on.

To configure an output alarm:

1. Configure the output port:

```
[edit chassis alarm relay output port port-number]
```

For example, to configure output port zero (0):

```
user@host# edit chassis alarm relay output port 0
```

2. Configure the trigger to set off the alarm:

```
[edit chassis alarm relay output port port-number (input-relay | mode | temperature)]
```

For example, to set off the alarm when the system temperature goes into the red status:

```
[edit chassis alarm relay output port 0]
user@host# set temperature
```

3. Verify the configuration with the **show** command:

```
[edit chassis alarm relay output port 0]
user@host# show
temperature;
```

4. Commit the configuration with the **commit** command.

To view the alarm output relay information, issue the **show chassis alarms** or **show chassis craft-interface** command from the Junos OS command line interface.

#### Related Documentation

- [User-Defined Alarm Relay Overview on page 519](#)
- [input](#)
- [show chassis craft-interface on page 950](#)
- [show chassis alarms on page 925](#)

## Chassis Alarms

Table 73 on page 524 lists the chassis-related alarms that are displayed when you execute the **show chassis alarms** operational mode command on PTX Series routers.

**Table 73: Chassis Alarms for PTX series routers**

Message displayed in the output of show chassis alarms Command	Description	Class	Solution
<b>Mix of PDUs (PTX5000)</b>	Appears when AC PDUs and DC PDUs are installed. Also appears when zoning and non- zoning PDUs are installed.	Minor	Install same type of PDUs in all slots.
<b>Power Manager Non Operational (PTX5000)</b>	Appears when zoning and non- zoning PDUs are installed.	Minor	Install same type of PDUs in all slots.
<b>No Redundant Power (PTX5000)</b>	When backup PDUs are absent or down	Minor	Install backup PDU.
<b>PDU 0/1 Converter Failed (PTX5000)</b>	Appears when one or more 36V booster converter fails in PDU (PDU2-PTX-DC ).	Major	Check PDU and replace if required.
<b>No redundant power for system (PTX5000)</b>	Appears when there is no backup PDUs in the router	Minor	Install backup PDU.
<b>No Power for System (PTX5000)</b>	Appears when the router is powered on with only one PSM.	Major	Install backup PDU.
<b>SIB 1 FPC Link Error (PTX5000)</b>	Appears when the indicated SIB is down.	Minor	Replace faulty SIB.
<b>SIB 1 Absent (PTX5000)</b>	Appears when the indicated SIB is absent.	Major	Replace faulty SIB.
<b>PDU 1 PSM 1 Not OK (PTX5000)</b>	Appears when the PSM in the displayed PDU is down.	Major	Replace faulty PSM.
<b>Host x disk drive y smart error(PTX5000)</b>	<p>Appears when there is an issue with the internal state of the disk such as, the disk life remaining is below the threshold.</p> <ul style="list-style-type: none"> <li>• x=0 for Host 0 (RE0) and 1 for Host 1 (RE1)</li> <li>• y=1 for disk 1 and 2 for disk 2</li> </ul>	Minor	Replace the disk.
<b>VMHost x Boot from alternate set(PTX5000)</b>	Appears when the Routing Engine is booted from the alternate set.	Minor	Verify logs. As required, recover the Routing Engine by using the command <b>request vmhost snapshot</b>

Table 73: Chassis Alarms for PTX series routers (continued)

Message displayed in the output of show chassis alarms Command	Description	Class	Solution
<b>VMHost RE x host application failed</b> (PTX5000)	Appears when one of the vmhost daemon has failed.	Minor	Manual mastership switchover followed by reboot using the command <b>request vmhost reboot</b> .
<b>VMHost Boot from alternate disk</b> (PTX5000)	Appears when the primary disk is corrupted and unable to launch the guest.	Minor	Recover the disk by using the command <b>request vmhost snapshot recovery</b> .
<b>Host 0/1 CPU Temperature Warm</b> (PTX5000)	Appears when the Routing Engine CPU temperature is above the TCONTROL threshold.  0 for Host 0 (RE0) and 1 for Host 1 (RE1)	Minor	No recovery action required from the user. Based on the temperature, the fan speed is changed to cool the system, thereby reducing the temperature.
<b>Host 0/1 CPU Temperature Hot</b> (PTX5000)	Appears when the Routing Engine CPU temperature is above the PROCHOT threshold.  0 for Host 0 (RE0) and 1 for Host 1 (RE1)	Minor	No recovery action required from the user. Based on the temperature, the fan speed is changed to cool the system, thereby reducing the temperature.
<b>Host 0/1 ECC single bit parity error</b> (PTX5000)	Appears when single bit ECC error is above the threshold value.  0 for Host 0 (RE0) and 1 for Host 1 (RE1)	Major	No recovery action required from the user. The count gets reset after 24 hours.
<b>Host 0 ECC 53 parity error</b> (PTX5000)	Appears when multiple bit Error Checking and Correction (ECC) error is above the threshold value.	Major	Reboot the router.
<b>VMHost RE x Disk y Missing</b> (PTX5000)	Appears when the disk in the Routing Engine is missing.  <ul style="list-style-type: none"> <li>• x—0 for RE0 and 1 for RE1</li> <li>• y—1 for disk 1 and 2 for disk 2</li> </ul>	Minor	Check if there is missing or a defective disk. Insert healthy disk. Take a snapshot and recover the disk by using the command <b>request vmhost snapshot</b> .  <i>See Disk Recovery Using the VM Host Snapshot in VM Host Installation</i>

Table 73: Chassis Alarms for PTX series routers (continued)

Message displayed in the output of show chassis alarms Command	Description	Class	Solution
<b>VMHost RE x Disk y Label Missing</b> (PTX5000)	<p>Appears when the labels on the disk in the Routing Engine is missing.</p> <ul style="list-style-type: none"> <li>• x-0 for RE0 and 1 for RE1</li> <li>• y-1 for disk 1 and 2 for disk 2</li> </ul>	Minor	Reboot the Routing-Engine from healthy disk and recover the impacted disk using the command <b>request vmhost snapshot</b> .
<b>VMHost RE x Disk y Wrong Slot</b> (PTX5000)	<p>Appears when there is disk swap or pre-labelled disk inserted in wrong slot.</p> <ul style="list-style-type: none"> <li>• x-0 for RE0 and 1 for RE1</li> <li>• y-1 for disk 1 and 2 for disk 2</li> </ul>	Minor	If both the disks are in wrong slot, swap the disks and reboot. If only one disk is in wrong slot, recover the disk via snapshot after booting from healthy disk.
<b>VMHost RE x Disk y File System Errors</b> (PTX5000)	<p>Appears when there is a file system error.</p> <ul style="list-style-type: none"> <li>• x-0 for RE0 and 1 for RE1</li> <li>• y-1 for disk 1 and 2 for disk 2</li> </ul>	Minor	Boot the Routing-engine from healthy disk and recover the impacted disk using the command <b>request vmhost snapshot</b> .
<b>VMHost RE x Disk y Write Rate Threshold Cross</b> (PTX5000)	<p>Appears if write rate threshold is crossed.</p> <ul style="list-style-type: none"> <li>• x-0 for RE0 and 1 for RE1</li> <li>• y-1 for disk 1 and 2 for disk 2</li> </ul>	Minor	Identify the application that is generating excessive writes and apply configuration changes to prevent excessive writes.
<b>VMHost RE x Disk y Size Incorrect</b> (PTX5000)	<p>Appears if the size of the disk is not appropriate for the platform.</p> <ul style="list-style-type: none"> <li>• x-0 for RE0 and 1 for RE1</li> <li>• y-1 for disk 1 and 2 for disk 2</li> </ul>	Minor	Insert an disk of the right size and reboot the Routing Engine.
<b>VMHost RE x Disk y Usage Is Above Threshold</b> (PTX5000)	<p>Appears when the usage of the disk partition is above the threshold limit.</p> <ul style="list-style-type: none"> <li>• x-0 for RE0 and 1 for RE1</li> <li>• y-1 for disk 1 and 2 for disk 2</li> </ul>	Minor	Cleanup the disks using <b>request vmhost cleanup</b> command.
<b>VMHost RE x Secure Boot Disabled</b> (PTX5000)	<p>Appears when Secure Boot is not enforced in the BIOS.</p>	Medium	Enable Secure Boot in the BIOS.



**Table 73: Chassis Alarms for PTX series routers (continued)**

Message displayed in the output of show chassis alarms Command	Description	Class	Solution
<b>VMHost RE x Secure BIOS Version Mismatch</b> (PTX5000)	Appears when current BIOS version is older than the Last Known good BIOS version.	Medium	Upgrade the BIOS using the <b>request system firmware</b> command.
<b>RE x Mismatch in total memory detected</b> (PTX5000)	Appears when total memory for Secure Boot SKUs is not 128-GB.	Medium	Check the available RAM size using <b>show vmhost hardware</b> command. If the RAM size is less than 128-GB, contact JTAC for a RAM upgrade.
<b>FPC x need bounce</b> (PTX10K Series)	Appears when port speed configuration needs an FPC reboot for the new speed configuration to take effect. <ul style="list-style-type: none"> <li>x-FPC slot number.</li> </ul>	Minor	Do one of the following to clear the alarm. <ul style="list-style-type: none"> <li>Manually reboot the FPC for the new port speed configuration to take effect.</li> <li>Delete the new port speed configuration that has triggered the alarm. In this case, the new port speed configuration will not take effect.</li> </ul>

[Table 74 on page 527](#) lists the chassis-related alarms that are displayed when you execute the **show chassis alarms** operational mode command on MX Series routers

**Table 74: Chassis Alarms for MX series routers**

Message displayed in the output of show chassis alarms Command	Description	Class	Solution
<b>Host x disk drive y smart error</b>	Appears when there is an issue with the internal state of the disk such as, the disk life remaining is below the threshold. <ul style="list-style-type: none"> <li>x-0 for Host 0 (RE0) and 1 for Host 1 (RE1)</li> <li>y-1 for disk 1 and 2 for disk 2</li> </ul>	Minor	Replace the disk.
<b>VMHost x Boot from alternate set</b>	Appears when the Routing Engine is booted from the alternate set.	Minor	Verify logs. As required, recover the Routing Engine by using the command <b>request vmhost snapshot</b>

Table 74: Chassis Alarms for MX series routers (continued)

Message displayed in the output of show chassis alarms Command	Description	Class	Solution
<b>VMHost RE x host application failed</b>	Appears when one of the vmhost daemon has failed.	Minor	Manual mastership switchover followed by reboot using the command <b>request vmhost reboot</b> .
<b>VMHost Boot from alternate disk</b>	Appears when the primary disk is corrupted and unable to launch the guest.	Minor	Recover the disk by using the command <b>request vmhost snapshot recovery</b> .
<b>Host 0/1 CPU Temperature Warm</b>	Appears when the Routing Engine CPU temperature is above the TCONTROL threshold.  0 for Host 0 (RE0) and 1 for Host 1 (RE1)	Minor	No recovery action required from the user. Based on the temperature, the fan speed is changed to cool the system thereby reducing the temperature
<b>Host 0/1 CPU Temperature Hot</b>	Appears when the Routing Engine CPU temperature is above the PROCHOT threshold.  0 for Host 0 (RE0) and 1 for Host 1 (RE1)	Minor	No recovery action required from the user. Based on the temperature, the fan speed is changed to cool the system thereby reducing the temperature
<b>Host 0/1 ECC single bit parity error</b>	Appears when single bit ECC error is above the threshold value.  0 for Host 0 (RE0) and 1 for Host 1 (RE1)	Major	No recovery action required from the user. The count gets reset after 24 hours.
<b>Host 0 ECC 53 parity error</b>	Appears when multiple bit ECC error is above the threshold value.	Major	Reboot the router.
<b>Mixed Master and Backup RE types</b>	Appears when dissimilar Routing Engines are present on the chassis.	Major	Both Routing Engines must be of the same model number. Replace one of the Routing Engines.
<b>VMHost RE x Disk y Missing</b>	Appears when the disk in the Routing Engine is missing.  <ul style="list-style-type: none"> <li>x=0 for RE0 and 1 for RE1</li> <li>y=1 for disk 1 and 2 for disk 2</li> </ul>	Minor	Check if there is missing or a defective disk. Insert healthy disk. Take a snapshot and recover the disk by using the command <b>request vmhost snapshot</b> .  See <i>Disk Recovery Using the VM Host Snapshot</i> in <i>VM Host Installation</i>

Table 74: Chassis Alarms for MX series routers (continued)

Message displayed in the output of show chassis alarms Command	Description	Class	Solution
<b>VMHost RE x Disk y Label Missing</b>	<p>Appears when the labels on the disk in the Routing Engine is missing.</p> <ul style="list-style-type: none"> <li>• x-0 for RE0 and 1 for RE1</li> <li>• y-1 for disk 1 and 2 for disk 2</li> </ul>	Minor	Reboot the Routing-Engine from healthy disk and recover the impacted disk using the command <b>request vmhost snapshot</b> .
<b>VMHost RE x Disk y Wrong Slot</b>	<p>Appears when there is disk swap or pre-labelled disk inserted in wrong slot.</p> <ul style="list-style-type: none"> <li>• x-0 for RE0 and 1 for RE1</li> <li>• y-1 for disk 1 and 2 for disk 2</li> </ul>	Minor	If both the disks are in wrong slot, swap the disks and reboot. If only one disk is in wrong slot, recover the disk via snapshot after booting from healthy disk.
<b>VMHost RE x Disk y File System Errors</b>	<p>Appears when there is a file system error.</p> <ul style="list-style-type: none"> <li>• x-0 for RE0 and 1 for RE1</li> <li>• y-1 for disk 1 and 2 for disk 2</li> </ul>	Minor	Boot the Routing-engine from healthy disk and recover the impacted disk using the command <b>request vmhost snapshot</b> .
<b>VMHost RE x Disk y Write Rate Threshold Cross</b>	<p>Appears if write rate threshold is crossed.</p> <ul style="list-style-type: none"> <li>• x-0 for RE0 and 1 for RE1</li> <li>• y-1 for disk 1 and 2 for disk 2</li> </ul>	Minor	Identify the application that is generating excessive writes and apply configuration changes to prevent the excessive writes.
<b>VMHost RE x Disk y Size Incorrect</b>	<p>Appears if the size of the disk is not appropriate for the platform.</p> <ul style="list-style-type: none"> <li>• x-0 for RE0 and 1 for RE1</li> <li>• y-1 for disk 1 and 2 for disk 2</li> </ul>	Minor	Insert an disk of the right size and reboot the Routing Engine.
<b>VMHost RE x Disk y Usage Is Above Threshold</b>	<p>Appears when the usage of the disk partition is above the threshold limit.</p> <ul style="list-style-type: none"> <li>• x-0 for RE0 and 1 for RE1</li> <li>• y-1 for disk 1 and 2 for disk 2</li> </ul>	Minor	Cleanup the disks using <b>request vmhost cleanup</b> command.
<b>VMHost RE x Secure Boot Disabled</b>	Appears when Secure Boot is not enforced in the BIOS.	Medium	Enable Secure Boot in the BIOS.

Table 74: Chassis Alarms for MX series routers (continued)

Message displayed in the output of show chassis alarms Command	Description	Class	Solution
VMHost RE x Secure BIOS Version Mismatch	Appears when current BIOS version is older than the Last Known good BIOS version.	Medium	Upgrade the BIOS using the <b>request system firmware</b> command.
RE x Mismatch in total memory detected	Appears when total memory for Secure Boot SKUs is not 128-GB.	Medium	Check the available RAM size using <b>show vmhost hardware</b> command. If the RAM size is less than 128-GB, contact JTAC for a RAM upgrade.

Related Documentation

- [show chassis alarms on page 925](#)

## Chassis Conditions That Trigger Alarms

Various conditions related to the chassis components trigger yellow and red alarms. You cannot configure these conditions.

- [Backup Routing Engine Alarms on page 567](#)
- [Chassis Component Alarm Conditions on M5 and M10 Routers on page 531](#)
- [Chassis Component Alarm Conditions on M7i and M10i Routers on page 533](#)
- [Chassis Component Alarm Conditions on M20 Routers on page 537](#)
- [Chassis Component Alarm Conditions on M40 Routers on page 541](#)
- [Chassis Component Alarm Conditions on M40e and M160 Routers on page 546](#)
- [Chassis Component Alarm Conditions on M120 Routers on page 551](#)
- [Chassis Component Alarm Conditions on M320 Routers on page 556](#)
- [Chassis Component Alarm Conditions on MX Series 5G Universal Routing Platforms on page 561](#)
- [Chassis Component Alarm Conditions for Guest Network Functions \(GNFs\) on page 569](#)
- For PTX5000 Packet Transport Router chassis component alarm conditions, see the [PTX5000 Packet Transport Router Hardware Guide](#)
- For T320 Core Router chassis component alarm conditions, see the [T320 Core Router Hardware Guide](#)
- For T640 Core Router chassis component alarm conditions, see the [T640 Core Router Hardware Guide](#)
- For T1600 Core Router chassis component alarm conditions, see the [T1600 Core Router Hardware Guide](#)

- For T4000 Core Router chassis component alarm conditions, see the [T4000 Core Router Hardware Guide](#)
- For TX Matrix chassis component alarm conditions, see the [TX Matrix Router Hardware Guide](#)
- For TX Matrix Plus chassis component alarm conditions, see the [TX Matrix Plus Router Hardware Guide](#)

## Chassis Component Alarm Conditions on M5 and M10 Routers

Table 75 on page 531 lists the alarms that the chassis components can generate on M5 and M10 routers.

**Table 75: Chassis Component Alarm Conditions on M5 and M10 Routers**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Alternative media	The router boots from an alternate boot device, the hard disk. The CompactFlash card is typically the primary boot device. The Routing Engine boots from the hard disk when the primary boot device fails.	Open a support case using the Case Manager link at <a href="http://www.juniper.net/">www.juniper.net/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Yellow
Craft interface	The craft interface has failed.	Replace failed craft interface.	Red
Fan trays	One fan tray has been removed from the chassis.	Install missing fan tray.	Yellow
	Two or more fan trays have been removed from the chassis.	Install missing fan trays.	Red
	One fan in the chassis is not spinning or is spinning below required speed.	Replace failed fan tray.	Red
Forwarding Engine Board (FEB)	The control board has failed. If this occurs, the board attempts to reboot.	Replace failed FEB.	Red
Flexible PIC Concentrator (FPC)	An FPC has failed. If this occurs, the FPC attempts to reboot. If the FEB sees that an FPC is rebooting too often, it shuts down the FPC.	Replace failed FPC.	Red

Table 75: Chassis Component Alarm Conditions on M5 and M10 Routers (continued)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs into the router's backplane from the front (generally, an FPC) is broken.	Replace failed component.	Red
Routing Engine	Error in reading or writing CompactFlash card.	Reformat CompactFlash card and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from hard disk.	Install bootable image on CompactFlash card. If this fails, replace failed Routing Engine.	Yellow
	CompactFlash card missing in boot list.	Replace failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace failed Routing Engine.	Red
	The Ethernet management interface ( <b>fxp0</b> or <b>em0</b> ) on the Routing Engine is down.	<ul style="list-style-type: none"> <li>• Check the interface cable connection.</li> <li>• Reboot the system.</li> <li>• If the alarm recurs, open a support case using the Case Manager link at <a href="https://www.juniper.net/support/">https://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States)</li> </ul>	Red
Power supplies	A power supply has been removed from the chassis.	Install missing power supply.	Yellow
	A power supply has failed.	Replace failed power supply.	Red

*Table 75: Chassis Component Alarm Conditions on M5 and M10 Routers (continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature has exceeded 55 degrees C (131 degrees F), the fans have been turned on to full speed, and one or more fans have failed.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and the fans have been turned on to full speed.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Red
	The chassis temperature has exceeded 75 degrees C (167 degrees F). If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Red
	The temperature sensor has failed.	<p>Open a support case using the Case Manager link at <a href="http://www.juniper.net/">www.juniper.net/</a></p> <p>or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).</p>	Red

## Chassis Component Alarm Conditions on M7i and M10i Routers

Table 76 on page 534 lists the alarms that the chassis components can generate on M7i and M10i routers.

**Table 76: Chassis Component Alarm Conditions on M7i and M10i Routers**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Alternative media	The router boots from an alternate boot device, the hard disk. The CompactFlash card is typically the primary boot device. The Routing Engine boots from the hard disk when the primary boot device fails.	Open a support case using the Case Manager link at <a href="https://www.juniper.net/support/">https://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Yellow
Compact FEB (CFEB)	For an M7i router, CFEB has failed. If this occurs, the board attempts to reboot.	Replace failed CFEB.	Red
	For an M10i router, both control boards have been removed or have failed.	Replace failed or missing CFEB.	Red
	Too many hard errors in CFEB memory.	Replace failed CFEB.	Red
	Too many soft errors in CFEB memory.	Replace failed CFEB.	Red
	A CFEB microcode download has failed.	Replace failed CFEB.	Red
Fan trays	A fan has failed.	Replace failed fan tray.	Red
	For an M7i router, a fan tray has been removed from the chassis.	Install missing fan tray.	Red
	For an M10i router, both fan trays are absent from the chassis.	Install missing fan tray.	Red
	For a TX Matrix Plus router, fan tray is not matching the ST-SIB-Ls SIB.	Install a Rev.3 fan tray.	Red
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs into the router's midplane from the front is broken.	Replace failed component.	Red



*Table 76: Chassis Component Alarm Conditions on M7i and M10i Routers (continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Power supplies	A power supply has been removed.	Insert missing power supply.	Yellow
	A power supply has failed.	Replace failed power supply.	Red
	For an M10i router, only one power supply is operating.	Insert or replace secondary power supply.	Red

Table 76: Chassis Component Alarm Conditions on M7i and M10i Routers (continued)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Excessive framing errors on console port.	Replace the serial cable connected to the device.	Yellow
	An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded.	If the cable is replaced and no excessive framing errors are detected within 5 minutes from the last detected framing error, the alarm is cleared automatically.	
	This might be caused by a faulty serial console port cable connected to the device.		
	Error in reading or writing hard disk.	Reformat hard disk and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	Error in reading or writing CompactFlash card.	Reformat CompactFlash card and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from hard disk. This alarm only applies, if you have an optional CompactFlash card.	Install bootable image on CompactFlash card. If this fails, replace failed Routing Engine.	Yellow
	CompactFlash card missing in boot list.	Replace failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace failed Routing Engine.	Red
	Routing Engine failed to boot.	Replace failed Routing Engine.	Red
	The Ethernet management interface ( <b>fxp0</b> or <b>em0</b> ) on the Routing Engine is down.	<ul style="list-style-type: none"> <li>• Check the interface cable connection.</li> <li>• Reboot the system.</li> <li>• If the alarm recurs, open a support case using the Case Manager link at <a href="https://www.juniper.net/support/">https://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States)</li> </ul>	Red

*Table 76: Chassis Component Alarm Conditions on M7i and M10i Routers (continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature has exceeded 55 degrees C (131 degrees F), the fans have been turned on to full speed, and one or more fans have failed.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and the fans have been turned on to full speed.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Red
	The chassis temperature has exceeded 75 degrees C (167 degrees F). If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at <a href="https://www.junipernet/support/">https://www.junipernet/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Red

## Chassis Component Alarm Conditions on M20 Routers

Table 77 on page 538 lists the alarms that the chassis components can generate on M20 routers.

Table 77: Chassis Component Alarm Conditions on M20 Routers

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Alternative media	The router boots from an alternate boot device, the hard disk. The CompactFlash card is typically the primary boot device. The Routing Engine boots from the hard disk when the primary boot device fails.	Open a support case using the Case Manager link at <a href="https://www.juniper.net/support/">https://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Yellow
Craft interface	The craft interface has failed.	Replace failed craft interface.	Red
Fan trays	One fan tray has been removed from the chassis.	Install missing fan tray.	Yellow
	Two or more fan trays have been removed from the chassis.	Install missing fan trays.	Red
	One fan in the chassis is not spinning or is spinning below requires speed.	Replace fan tray.	Red
FPC	An FPC has failed. If this occurs, the FPC attempts to reboot. If the System and Switch Board (SSB) sees that an FPC is rebooting too often, it shuts down the FPC.	Replace failed FPC.	Red
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs in to the router's backplane from the front (generally, an FPC) is broken.	Replace failed component.	Red

Table 77: Chassis Component Alarm Conditions on M20 Routers (continued)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Excessive framing errors on console port.	Replace the serial cable connected to the device.	Yellow
	An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded.	If the cable is replaced and no excessive framing errors are detected within 5 minutes from the last detected framing error, the alarm is cleared automatically.	
	This might be caused by a faulty serial console port cable connected to the device.		
	Error in reading or writing hard disk.	Reformat hard disk and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	Error in reading or writing CompactFlash card.	Reformat CompactFlash card and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from default backup Routing Engine. If you manually switched mastership, ignore this alarm condition.	Install bootable image on default master Routing Engine. If this fails, replace failed Routing Engine.	Yellow
	System booted from hard disk.	Install bootable image on CompactFlash card. If this fails, replace failed Routing Engine.	Yellow
	CompactFlash card missing in boot list.	Replace failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace failed Routing Engine.	Red
	The Ethernet management interface ( <b>fxp0</b> or <b>em0</b> ) on the Routing Engine is down.		Red

**Table 77: Chassis Component Alarm Conditions on M20 Routers (continued)**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		<ul style="list-style-type: none"> <li>• Check the interface cable connection.</li> <li>• Reboot the system.</li> <li>• If the alarm recurs, open a support case using the Case Manager link at <a href="https://www.juniper.net/support/">https://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States)</li> </ul>	
	Routing Engine failed to boot.	Replace failed Routing Engine.	Red
Power supplies	A power supply has been removed from the chassis.	Insert power supply into empty slot.	Yellow
	A power supply has failed.	Replace failed power supply.	Red
SSB	The control board has failed. If this occurs, the board attempts to reboot.	Replace failed control board.	Red

**Table 77: Chassis Component Alarm Conditions on M20 Routers (continued)**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature has exceeded 55 degrees C (131 degrees F), the fans have been turned on to full speed, and one or more fans have failed.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and the fans have been turned on to full speed.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Red
	The chassis temperature has exceeded 75 degrees C (167 degrees F). If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at <a href="https://www.junipernet/support/">https://www.junipernet/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Red

## Chassis Component Alarm Conditions on M40 Routers

Table 78 on page 541 lists the alarms that the chassis components can generate on M40 routers.

**Table 78: Chassis Component Alarm Conditions on M40 Routers**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Air filter	Change air filter.	Change air filter.	Yellow

Table 78: Chassis Component Alarm Conditions on M40 Routers (continued)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Alternative media	The router boots from an alternate boot device, the hard disk. The CompactFlash card is typically the primary boot device. The Routing Engine boots from the hard disk when the primary boot device fails.	Open a support case using the Case Manager link at <a href="https://www.juniper.net/support/">https://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Yellow
Craft interface	The craft interface has failed.	Replace failed craft interface.	Red
Fan trays	One fan tray has been removed from the chassis.	Install missing fan tray.	Yellow
	Two or more fan trays have been removed from the chassis.	Install missing fan trays.	Red
	One fan in the chassis is not spinning or is spinning below required speed.	Replace fan tray.	Red
FPC	An FPC has an out of range or invalid temperature reading.	Replace failed FPC.	Yellow
	An FPC microcode download has failed.	Replace failed FPC.	Red
	An FPC has failed. If this occurs, the FPC attempts to reboot. If the SCB sees that an FPC is rebooting too often, it shuts down the FPC.	Replace failed FPC.	Red
	Too many hard errors in FPC memory.	Replace failed FPC.	Red
	Too many soft errors in FPC memory.	Replace failed FPC.	Red
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs into the router's backplane from the front (generally, an FPC) is broken.	Replace failed component.	Red



*Table 78: Chassis Component Alarm Conditions on M40 Routers (continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Power supplies	A power supply has been removed from the chassis.	Insert power supply into empty slot.	Yellow
	A power supply temperature sensor has failed.	Replace failed power supply or power entry module.	Yellow
	A power supply fan has failed.	Replace failed power supply fan.	Yellow
	A power supply has high temperature.	Replace failed power supply or power entry module.	Red
	A 5-V power supply has failed.	Replace failed power supply or power entry module.	Red
	A 3.3-V power supply has failed.	Replace failed power supply or power entry module.	Red
	A 2.5-V power supply has failed.	Replace failed power supply or power entry module.	Red
	A power supply input has failed.	Check power supply input connection.	Red
	A power supply has failed.	Replace failed power supply or power entry module.	Red

*Table 78: Chassis Component Alarm Conditions on M40 Routers (continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Excessive framing errors on console port.	Replace the serial cable connected to the device.	Yellow
	An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded.	If the cable is replaced and no excessive framing errors are detected within 5 minutes from the last detected framing error, the alarm is cleared automatically.	
	This might be caused by a faulty serial console port cable connected to the device.		
	Error in reading or writing hard disk.	Reformat hard disk and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	Error in reading or writing CompactFlash card.	Reformat CompactFlash card and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from default backup Routing Engine. If you manually switched mastership, ignore this alarm condition.	Install bootable image on default master Routing Engine. If this fails, replace failed Routing Engine.	Yellow
	System booted from hard disk.	Install bootable image on CompactFlash card. If this fails, replace failed Routing Engine.	Yellow
	CompactFlash card missing in boot list.	Replace failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace failed Routing Engine.	Red
	Routing Engine failed to boot.	Replace failed Routing Engine.	Red
	The Ethernet management interface ( <b>fxp0</b> or <b>em0</b> ) on the Routing Engine is down.		Red

*Table 78: Chassis Component Alarm Conditions on M40 Routers (continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		<ul style="list-style-type: none"> <li>• Check the interface cable connection.</li> <li>• Reboot the system.</li> <li>• If the alarm recurs, open a support case using the Case Manager link at <a href="https://www.juniper.net/support/">https://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States)</li> </ul>	
SCB	The System Control Board (SCB) has failed. If this occurs, the board attempts to reboot.	Replace failed SCB.	Red

**Table 78: Chassis Component Alarm Conditions on M40 Routers (continued)**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature has exceeded 55 degrees C (131 degrees F), the fans have been turned on to full speed, and one or more fans have failed.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and the fans have been turned on to full speed.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Red
	The chassis temperature has exceeded 75 degrees C (167 degrees F). If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at <a href="https://www.junipernet/support/">https://www.junipernet/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Red

## Chassis Component Alarm Conditions on M40e and M160 Routers

Table 79 on page 546 lists the alarms that the chassis components can generate on M40e and M160 routers.

**Table 79: Chassis Component Alarm Conditions on M40e and M160 Routers**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Air filter	Change air filter.	Change air filter.	Yellow

Table 79: Chassis Component Alarm Conditions on M40e and M160 Routers (continued)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Alternative media	The router boots from an alternate boot device, the hard disk. The CompactFlash card is typically the primary boot device. The Routing Engine boots from the hard disk when the primary boot device fails.	Open a support case using the Case Manager link at <a href="https://www.juniper.net/support/">https://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Yellow
Connector Interface Panel (CIP)	A CIP is missing.	Insert CIP into empty slot.	Red
Craft interface	The craft interface has failed.	Replace failed craft interface.	Red
Fan trays	One fan tray has been removed from the chassis.	Install missing fan tray.	Yellow
	Two or more fan trays have been removed from the chassis.	Install missing fan trays.	Red
	One fan in the chassis is not spinning or spinning below required speed.	Replace fan tray.	Red
FPC	An FPC has an out of range or invalid temperature reading.	Replace failed FPC.	Yellow
	An FPC microcode download has failed.	Replace failed FPC.	Red
	An FPC has failed. If this occurs, the FPC attempts to reboot. If the MCS sees that an FPC is rebooting too often, it shuts down the FPC.	Replace failed FPC.	Red
	Too many hard errors in FPC memory.	Replace failed FPC.	Red
	Too many soft errors in FPC memory.	Replace failed FPC.	Red

*Table 79: Chassis Component Alarm Conditions on M40e and M160 Routers (continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs into the router's backplane from the front (generally, an FPC) is broken.	Replace failed component.	Red
Miscellaneous Control Subsystem (MCS)	An MCS has an out of range or invalid temperature reading.	Replace failed MCS.	Yellow
	MCS0 has been removed.	Reinstall MCS0.	Yellow
	An MCS has failed.	Replace failed MCS.	Red
Packet Forwarding Engine Clock Generator (PCG)	A backup PCG is offline.	Set backup PCG online.	Yellow
	A PCG has an out of range or invalid temperature reading.	Replace failed PCG.	Yellow
	A PCG has been removed.	Insert PCG into empty slot.	Yellow
	A PCG has failed to come online.	Replace failed PCG.	Red

Table 79: Chassis Component Alarm Conditions on M40e and M160 Routers (continued)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Excessive framing errors on console port.	Replace the serial cable connected to the device.	Yellow
	An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded.	If the cable is replaced and no excessive framing errors are detected within 5 minutes from the last detected framing error, the alarm is cleared automatically.	
	This might be caused by a faulty serial console port cable connected to the device.		
	Error in reading or writing hard disk.	Reformat hard disk and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	Error in reading or writing CompactFlash card.	Reformat CompactFlash card and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from default backup Routing Engine. If you manually switched mastership, ignore this alarm condition.	Install bootable image on default master Routing Engine. If this fails, replace failed Routing Engine.	Yellow
	System booted from hard disk.	Install bootable image on CompactFlash card. If this fails, replace failed Routing Engine.	Yellow
	CompactFlash card missing in boot list.	Replace failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace failed Routing Engine.	Red
	Routing Engine failed to boot.	Replace failed Routing Engine.	Red
	The Ethernet management interface ( <b>fxp0</b> or <b>em0</b> ) on the Routing Engine is down.		Red

Table 79: Chassis Component Alarm Conditions on M40e and M160 Routers (continued)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		<ul style="list-style-type: none"> <li>Check the interface cable connection.</li> <li>Reboot the system.</li> <li>If the alarm recurs, open a support case using the Case Manager link at <a href="https://www.juniper.net/support/">https://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States)</li> </ul>	
Power supplies	A power supply has been removed from the chassis.	Insert power supply into empty slot.	Yellow
	A power supply has failed.	Replace failed power supply.	Red
Switching and Forwarding Module (SFM)	An SFM has an out of range or invalid temperature reading on SPP.	Replace failed SFM.	Yellow
	An SFM has an out of range or invalid temperature reading on SPR.	Replace failed SFM.	Yellow
	An SFM is offline.	Set SFM online.	Yellow
	An SFM has failed.	Replace failed SFM.	Red
	An SFM has been removed from the chassis.	Insert SFM into empty slot.	Red
	All SFMs are offline or missing from the chassis.	Insert SFMs into empty slots or set all SFMs online.	Red



*Table 79: Chassis Component Alarm Conditions on M40e and M160 Routers (continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature has exceeded 55 degrees C (131 degrees F), the fans have been turned on to full speed, and one or more fans have failed.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and the fans have been turned on to full speed.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Red
	The chassis temperature has exceeded 75 degrees C (167 degrees F). If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at <a href="https://www.junipernet/support/">https://www.junipernet/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Red

## Chassis Component Alarm Conditions on M120 Routers

Table 80 on page 551 lists the alarms that the chassis components can generate on M120 routers.

*Table 80: Chassis Component Alarm Conditions on M120 Routers*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Air filters	Change air filter.	Change air filter.	Yellow

**Table 80: Chassis Component Alarm Conditions on M120 Routers (continued)**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Alternative media	The router boots from an alternate boot device, the hard disk. The CompactFlash card is typically the primary boot device. The Routing Engine boots from the hard disk when the primary boot device fails.	Open a support case using the Case Manager link at <a href="https://www.juniper.net/support/">https://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Yellow
	A CB Ethernet switch has failed.	Replace failed CB.	Yellow
	A CB has been removed.	Insert CB into empty slot.	Red
Control Board (CB)	A CB has failed.	Replace failed CB.	Red
	The craft interface has failed.	Replace failed craft interface.	Red
	Craft interface		
Fan trays	One fan tray has been removed from the chassis.	Install missing fan tray.	Yellow
	Two or more fan trays have been removed from the chassis.	Install missing fan trays.	Red
	One fan in the chassis is not spinning or is spinning below required speed.	Replace fan tray.	Red
Forwarding Engine Boards (FEBs)	A spare FEB has failed.	Replace failed FEB.	Yellow
	A spare FEB has been removed.	Insert FEB into empty slot.	Yellow
	A FEB is offline.	Check FEB. Remove and reinsert the FEB. If this fails, replace failed FEB.	Yellow
	A FEB has failed.	Replace failed FEB.	Red
	A FEB has been removed.	Insert FEB into empty slot.	Red

*Table 80: Chassis Component Alarm Conditions on M120 Routers (continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Host subsystem	A host subsystem has failed.	Replace the host subsystem.	Yellow
	A host subsystem has been removed.	Insert host subsystem into empty slot.	Red
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs into the router's backplane from the front (generally, an FPC) is broken.	Replace failed component.	Red
Power supplies	A power supply has been removed from the chassis.	Insert power supply into empty slot.	Yellow
	A power supply has a high temperature.	Replace failed power supply or power entry module.	Red
	A power supply input has failed.	Check power supply input connection.	Red
	A power supply output has failed.	Check power supply output connection.	Red
	A power supply has failed.	Replace failed power supply.	Red

*Table 80: Chassis Component Alarm Conditions on M120 Routers (continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Excessive framing errors on console port.	Replace the serial cable connected to the device.	Yellow
	An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded.	If the cable is replaced and no excessive framing errors are detected within 5 minutes from the last detected framing error, the alarm is cleared automatically.	
	This might be caused by a faulty serial console port cable connected to the device.		
	Error in reading or writing hard disk.	Reformat hard disk and install bootable image. If this fails, replace failed Routing Engine.	
	Error in reading or writing CompactFlash card.	Reformat CompactFlash card and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from default backup Routing Engine. If you manually switched mastership, ignore this alarm condition.	Install bootable image on default master Routing Engine. If this fails, replace failed Routing Engine.	Yellow
	System booted from hard disk.	Install bootable image on CompactFlash card. If this fails, replace failed Routing Engine.	Yellow
	CompactFlash card missing in boot list.	Replace failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace failed Routing Engine.	Red
	Routing Engine failed to boot.	Replace failed Routing Engine.	Red
	The Ethernet management interface ( <b>fxp0</b> or <b>em0</b> ) on the Routing Engine is down.		Red

*Table 80: Chassis Component Alarm Conditions on M120 Routers (continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		<ul style="list-style-type: none"><li>• Check the interface cable connection.</li><li>• Reboot the system.</li><li>• If the alarm recurs, open a support case using the Case Manager link at <a href="https://www.juniper.com/support/">https://www.juniper.com/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States)</li></ul>	

*Table 80: Chassis Component Alarm Conditions on M120 Routers (continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature has exceeded 55 degrees C (131 degrees F), the fans have been turned on to full speed, and one or more fans have failed.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and the fans have been turned on to full speed.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Red
	Chassis temperature has exceeded 75 degrees C (167 degrees F). If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at <a href="https://www.juniper.net/support/">https://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Red

## Chassis Component Alarm Conditions on M320 Routers

Table 81 on page 557 lists the alarms that the chassis components can generate on M320 routers.

**Table 81: Chassis Component Alarm Conditions on M320 Routers**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Air filters	Change air filter.	Change air filter.	Yellow
Alternative media	The router boots from an alternate boot device, the hard disk. The CompactFlash card is typically the primary boot device. The Routing Engine boots from the hard disk when the primary boot device fails.	Open a support case using the Case Manager link at <a href="https://www.juniper.net/support/">https://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Yellow
Control Board (CB)	A CB has been removed.	Insert CB into empty slot.	Yellow
	A CB temperature sensor alarm has failed.	Replace failed CB.	Yellow
	A CB has failed.	Replace failed CB.	Red
CIP	A CIP is missing.	Insert CIP into empty slot.	Red
Craft interface	The craft interface has failed.	Replace failed craft interface.	Red
Fan trays	One fan tray has been removed from the chassis.	Install missing fan tray.	Yellow
	Two or more fan trays have been removed from the chassis.	Install missing fan trays.	Red
	One fan in the chassis is not spinning or is spinning below required speed.	Replace fan tray.	Red

**Table 81: Chassis Component Alarm Conditions on M320 Routers (continued)**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
FPC	An FPC has an out of range or invalid temperature reading.	Replace failed FPC.	Yellow
	An FPC microcode download has failed.	Replace failed FPC.	Red
	An FPC has failed. If this occurs, the FPC attempts to reboot. If the CB sees that an FPC is rebooting too often, it shuts down the FPC.	Replace failed FPC.	Red
	Too many hard errors in FPC memory.	Replace failed FPC.	Red
	Too many soft errors in FPC memory.	Replace failed FPC.	Red
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs into the router's backplane from the front (generally, an FPC) is broken.	Replace failed component.	Red
Power supplies	A power supply has been removed from the chassis.	Insert power supply into empty slot.	Yellow
	A power supply has failed.	Replace failed power supply.	Red



Table 81: Chassis Component Alarm Conditions on M320 Routers (continued)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Excessive framing errors on console port.	Replace the serial cable connected to the device.	Yellow
	An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded.	If the cable is replaced and no excessive framing errors are detected within 5 minutes from the last detected framing error, the alarm is cleared automatically.	
	This might be caused by a faulty serial console port cable connected to the device.		
	Error in reading or writing hard disk.	Reformat hard disk and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	Error in reading or writing CompactFlash card.	Reformat CompactFlash card and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from default backup Routing Engine. If you manually switched mastership, ignore this alarm condition.	Install bootable image on default master Routing Engine. If this fails, replace failed Routing Engine.	Yellow
	System booted from hard disk.	Install bootable image on CompactFlash card. If this fails, replace failed Routing Engine.	Yellow
	CompactFlash card missing in boot list.	Replace failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace failed Routing Engine.	Red
	Routing Engine failed to boot.	Replace failed Routing Engine.	Red
	A spare SIB is missing.	Insert spare SIB in to empty slot.	Yellow
	The Ethernet management interface ( <b>fxp0</b> or <b>em0</b> ) on the Routing Engine is down.		Red

**Table 81: Chassis Component Alarm Conditions on M320 Routers (continued)**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		<ul style="list-style-type: none"> <li>• Check the interface cable connection.</li> <li>• Reboot the system.</li> <li>• If the alarm recurs, open a support case using the Case Manager link at <a href="https://www.juniper.net/support/">https://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States)</li> </ul>	
Switch Interface Board (SIB)	A SIB has failed.	Replace failed SIB.	Yellow
	A spare SIB has failed.	Replace failed SIB.	Yellow
	A SIB has an out of range or invalid temperature reading.	Replace failed SIB.	Yellow
	A SIB is missing.	Insert SIB into empty slot.	Red
	A SIB has failed.	Replace failed SIB.	Red
	The chassis temperature has exceeded 55 degrees C (131 degrees F), the fans have been turned on to full speed, and one or more fans have failed.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Yellow

**Table 81: Chassis Component Alarm Conditions on M320 Routers (continued)**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature has exceeded 65 degrees C (149 degrees F), and the fans have been turned on to full speed.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Red
	Chassis temperature has exceeded 75 degrees C (167 degrees F). If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at <a href="https://www.juniper.net/support/">https://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Red

## Chassis Component Alarm Conditions on MX Series 5G Universal Routing Platforms

Table 82 on page 561 lists the alarms that the chassis components can generate on MX Series 5G Universal Routing Platforms.

**Table 82: Chassis Component Alarm Conditions on MX Series 5G Universal Routing Platforms**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Air filters	Change air filter.	Change air filter.	Yellow

**Table 82: Chassis Component Alarm Conditions on MX Series 5G Universal Routing Platforms (continued)**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Alternative media	The router boots from an alternate boot device, the hard disk. The CompactFlash card is typically the primary boot device. The Routing Engine boots from the hard disk when the primary boot device fails.	Open a support case using the Case Manager link at <a href="https://www.juniper.net/support/">https://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Yellow
Craft interface	The craft interface has failed.	Replace failed craft interface.	Red
Dense Port Concentrators (DPC)s	A DPC is offline.	Check DPC. Remove and reinsert the DPC. If this fails, replace failed DPC.	Yellow
	A DPC has failed.	Replace failed DPC.	Red
	A DPC has been removed.	Insert DPC into empty slot.	Red
Fan trays	A fan tray has been removed from the chassis.	Install missing fan tray.	Red
	One fan in the chassis is not spinning or is spinning below required speed.	Replace fan tray.	Red
	A higher-cooling capacity fan tray is required when an MPC is installed on the chassis.	Upgrade to a high-capacity fan tray.	Yellow
Host subsystem	A host subsystem has been removed.	Insert host subsystem into empty slot.	Yellow
	A host subsystem has failed.	Replace failed host subsystem.	Red
Hot swapping	Too many hot-swap interrupts are occurring. This message generally indicates that a hardware component that plugs into the router's backplane from the front (generally, an FPC) is broken.	Replace failed component.	Red

**Table 82: Chassis Component Alarm Conditions on MX Series 5G Universal Routing Platforms (continued)**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Power supplies	A power supply has been removed from the chassis.	Insert power supply into empty slot.	Yellow
	A power supply has a high temperature.	Replace failed power supply or power entry module.	Red
	A power supply input has failed.	Check power supply input connection.	Red
	A power supply output has failed.	Check power supply output connection.	Red
	A power supply has failed.	Replace failed power supply.	Red
	Invalid AC power supply configuration.	When two AC power supplies are installed, insert one power supply into an odd-numbered slot and the other power supply into an even-numbered slot.	Red
	Invalid DC power supply configuration.	When two DC power supplies are installed, insert one power supply into an odd-numbered slot and the other power supply into an even-numbered slot.	Red
	Mix of AC and DC power supplies.	Do not mix AC and DC power supplies. For DC power, remove the AC power supply. For AC power, remove the DC power supply.	Red
	Not enough power supplies.	Install an additional power supply.	Red

**Table 82: Chassis Component Alarm Conditions on MX Series 5G Universal Routing Platforms (continued)**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Excessive framing errors on console port.	Replace the serial cable connected to the device.	Yellow
	An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded.	If the cable is replaced and no excessive framing errors are detected within 5 minutes from the last detected framing error, the alarm is cleared automatically.	
	This might be caused by a faulty serial console port cable connected to the device.		
	Error in reading or writing hard disk.	Reformat hard disk and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	Error in reading or writing CompactFlash card.	Reformat CompactFlash card and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from default backup Routing Engine. If you manually switched mastership, ignore this alarm condition.	Install bootable image on default master Routing Engine. If this fails, replace failed Routing Engine.	Yellow
	System booted from hard disk.	Install bootable image on CompactFlash card. If this fails, replace failed Routing Engine.	Yellow
	CompactFlash card missing in boot list.	Replace failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace failed Routing Engine.	Red
	Routing Engine failed to boot.	Replace failed Routing Engine.	Red
	The Ethernet management interface ( <b>fxp0</b> or <b>em0</b> ) on the Routing Engine is down.		Red

**Table 82: Chassis Component Alarm Conditions on MX Series 5G Universal Routing Platforms (continued)**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		<ul style="list-style-type: none"> <li>• Check the interface cable connection.</li> <li>• Reboot the system.</li> <li>• If the alarm recurs, open a support case using the Case Manager link at <a href="https://www.juniper.net/support/">https://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States)</li> </ul>	
System Control Board (SCB)	An SCB has been removed.	Insert SCB into empty slot.	Yellow
	An SCB temperature sensor alarm has failed.	Replace failed SCB.	Yellow
	An SCB has failed.	Replace failed SCB.	Red

**Table 82: Chassis Component Alarm Conditions on MX Series 5G Universal Routing Platforms (continued)**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Temperature	The chassis temperature has exceeded 55 degrees C (131 degrees F), the fans have been turned on to full speed, and one or more fans have failed.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and the fans have been turned on to full speed.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Yellow
	The chassis temperature has exceeded 65 degrees C (149 degrees F), and a fan has failed. If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Red
	Chassis temperature has exceeded 75 degrees C (167 degrees F). If this condition persists for more than 4 minutes, the router shuts down.	<ul style="list-style-type: none"> <li>• Check room temperature.</li> <li>• Check air filter and replace it.</li> <li>• Check airflow.</li> <li>• Check fan.</li> </ul>	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at <a href="https://www.juniper.net/support/">https://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Red



**Table 82: Chassis Component Alarm Conditions on MX Series 5G Universal Routing Platforms (continued)**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Flexible PIC Concentrator (FPC)	<p>FPC &lt;slot number&gt; Major Errors</p> <p>On MX Series routers with MPC1 and MPC2 line cards, a major chassis alarm is raised when the following transient hardware errors occur</p> <ul style="list-style-type: none"> <li>• CPQ Sram parity error</li> <li>• CPQ RLD RAM double bit ECC error</li> </ul> <p>By default, these errors result in the Packet Forwarding Engine interfaces on the FPC being disabled. You can use the <b>show chassis fpc errors</b> command to view the default or user-configured action that resulted from the error.</p> <p>You can check the syslog messages to know more about the errors. See the following examples:</p> <pre>Oct 5 15:58:02 codeine fpc1 MQCHIP(0) CPQ RLDRAM double bit ECC error, bank 0 addr 0x0  Oct 5 15:58:02 codeine fpc1 MQCHIP(0) CPQ Sram parity error, errlog 0x0</pre>	To resolve the error, restart the line card. If the error is still not resolved, open a support case using the Case Manager link at <a href="https://www.juniper.net/support/">https://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Red

## Backup Routing Engine Alarms

For routers with master and backup Routing Engines, a master Routing Engine can generate alarms for events that occur on a backup Routing Engine. [Table 83 on page 568](#) lists chassis alarms generated for a backup Routing Engine.



**NOTE:** Because the failure occurs on the backup Routing Engine, alarm severity for some events (such as Ethernet interface failures) is yellow instead of red.



**NOTE:** For information about configuring redundant Routing Engines, see the *Junos OS High Availability Library for Routing Devices*.

**Table 83: Backup Routing Engine Alarms**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Alternative media	The backup Routing Engine boots from an alternate boot device, the hard disk. The CompactFlash card is typically the primary boot device. The Routing Engine boots from the hard disk when the primary boot device fails.	Open a support case using the Case Manager link at <a href="https://www.juniper.net/support/">https://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Yellow
Boot Device	The boot device (CompactFlash or hard disk) is missing in boot list on the backup Routing Engine.	Replace failed backup Routing Engine.	Red
Ethernet	The Ethernet management interface ( <b>fxp0</b> or <b>em0</b> ) on the backup Routing Engine is down.	<ul style="list-style-type: none"> <li>Check the interface cable connection.</li> <li>Reboot the system.</li> <li>If the alarm recurs, open a support case using the Case Manager link at <a href="https://www.juniper.net/support/">https://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States)</li> </ul>	Yellow
FRU Offline	The backup Routing Engine has stopped communicating with the master Routing Engine.	Open a support case using the Case Manager link at <a href="https://www.juniper.net/support/">https://www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States).	Yellow
Hard Disk	Error in reading or writing hard disk on the backup Routing Engine.	Reformat hard disk and install bootable image. If this fails, replace failed backup Routing Engine.	Yellow

**Table 83: Backup Routing Engine Alarms (continued)**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Multibit Memory ECC	The backup Routing Engine reports a multibit ECC error.	<ul style="list-style-type: none"> <li>Reboot the system with the board reset button on the backup Routing Engine.</li> <li>If the alarm recurs, open a support case using the Case Manager link at <a href="http://www.juniper.net/support/">www.juniper.net/support/</a> or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States)</li> </ul>	Yellow

## Chassis Component Alarm Conditions for Guest Network Functions (GNFs)

Table 84 on page 569 lists the Chassis conditions that trigger alarms on guest network functions (GNFs).

Read more about GNFs in [this Junos Node Slicing article](#).

**Table 84: GNF Alarms**

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	<p>Mixed Master and Backup RE types</p> <p>This alarm is raised when the GNF Master Routing Engine and GNF Backup Routing Engine have been assigned either mismatching frequencies ( with difference above 100 MHz), mismatching numbers of cores, or DRAM.</p>	Correct the differences and then relaunch the corrected GNF Routing Engine.	Yellow
Routing Engine	<p>System Incompatibility with BSYS</p> <p>The alarm is shown when any incompatibilities between BSYS and GNF software versions cause the GNF to go offline.</p>	Make the required changes to the BSYS or GNF software through upgrade.	Red

Table 84: GNF Alarms (continued)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	<p>Feature Incompatibility with BSYS</p> <p>Indicates a minor incompatibility between BSYS and GNF software versions. This could result in a:</p> <ul style="list-style-type: none"> <li>• A warning error for the GNF.</li> <li>• A FRU going offline.</li> </ul> <p><b>NOTE:</b> Minor incompatibilities do not cause the GNF to go offline.</p>	Make the required changes to the BSYS or GNF software through upgrade.	Yellow

**Related Documentation**

- [Silencing External Devices Connected to Alarm Relay Contacts on page 574](#)

## System Alarms

- [System Utilization Alarms on page 570](#)
- [Configuring Junos OS to Determine Conditions That Trigger Alarms on Different Interface Types on page 571](#)

### System Utilization Alarms

Switches provide predefined system alarms that can be triggered by a missing rescue configuration, failure to install a license for a licensed software feature, or high disk usage. You can display alarm messages by issuing the **show system alarms** operational mode command.

For example: The switch might trigger an alarm when disk usage in the **/var** partition exceeds 75 percent. A usage level between 76 and 90 percent indicates high usage and raises a minor alarm condition, whereas a usage level above 90 percent indicates that the partition is full and raises a major alarm condition.

The following sample output shows the system alarm messages that are displayed when disk usage is exceeded on the switch.

```
user@host> show system alarms
```

```
4 alarms currently active
Alarm time      Class  Description
2013-10-08 20:08:20 UTC  Minor  RE 0 /var partition usage is high
2013-10-08 20:08:20 UTC  Major  RE 0 /var partition is full
2013-10-08 20:08:08 UTC  Minor  FPC 1 /var partition usage is high
2013-10-08 20:08:08 UTC  Major  FPC 1 /var partition is full
```



**BEST PRACTICE:** We recommend that you regularly request a system file storage cleanup to optimize the performance of the switch and prevent generating system alarms.

- See Also**
- [Freeing Up System Storage Space](#)
  - [show system alarms](#)

## Configuring Junos OS to Determine Conditions That Trigger Alarms on Different Interface Types

For the different types of PICs, you can configure which conditions trigger alarms and whether they trigger a red or yellow alarm. Red alarm conditions light the **RED ALARM** LED and trigger an audible alarm if one is connected. Yellow alarm conditions light the **YELLOW ALARM** LED and trigger an audible alarm if one is connected.



**NOTE:** By default, any failure condition on the integrated-services interface (Adaptive Services PIC) triggers a red alarm.

To configure conditions that trigger alarms and that can occur on any interface of the specified type, include the **alarm** statement at the **[edit chassis]** hierarchy level.

```
[edit chassis]
alarm {
  interface-type {
    alarm-name (red | yellow | ignore);
  }
}
```

**alarm-name** is the name of an alarm.

- See Also**
- [System-Wide Alarms and Alarms for Each Interface Type](#) on page 571
  - [Chassis Conditions That Trigger Alarms](#) on page 530
  - [Silencing External Devices Connected to Alarm Relay Contacts](#) on page 574

- Related Documentation**
- [Understanding Alarms](#)
  - [Network Management and Monitoring Guide](#)

## System-Wide Alarms and Alarms for Each Interface Type

Table 85 on page 572 lists the system-wide alarms and the alarms for each interface type.

**Table 85: Configurable PIC Alarm Conditions**

Interface/System	Alarm Condition	Configuration Option
SONET/SDH and ATM	Link alarm indication signal	<b>ais-l</b>
	Path alarm indication signal	<b>ais-p</b>
	Signal degrade (SD)	<b>ber-sd</b>
	Signal fail (SF)	<b>ber-sf</b>
	Loss of cell delineation (ATM only)	<b>locd</b>
	Loss of framing	<b>lof</b>
	Loss of light	<b>lol</b>
	Loss of pointer	<b>lop-p</b>
	Loss of signal	<b>los</b>
	Phase-locked loop out of lock	<b>pll</b>
	Synchronous transport signal (STS) payload label (C2) mismatch	<b>plm-p</b>
	Line remote failure indication	<b>rfi-l</b>
	Path remote failure indication	<b>rfi-p</b>
	STS path (C2) unequipped	<b>uneq-p</b>
E3/T3	Alarm indicator signal	<b>ais</b>
	Excessive numbers of zeros	<b>exz</b>
	Failure of the far end	<b>ferf</b>
	Idle alarm	<b>idle</b>
	Line code violation	<b>lcv</b>
	Loss of frame	<b>lof</b>
	Loss of signal	<b>los</b>
	Phase-locked loop out of lock	<b>pll</b>
	Yellow alarm	<b>ylw</b>

Table 85: Configurable PIC Alarm Conditions (continued)

Interface/System	Alarm Condition	Configuration Option
Ethernet	Link has gone down	link-down
DS1	Alarm indicator signal	ais
	Yellow alarm	ylw
Integrated services	Hardware or software failure	failure
Management Ethernet	Link has gone down	link-down

Related Documentation

- [System Alarms on page 570](#)

## Configuring Junos OS to Determine Conditions That Trigger Alarms on Different Interface Types

For the different types of PICs, you can configure which conditions trigger alarms and whether they trigger a red or yellow alarm. Red alarm conditions light the **RED ALARM** LED and trigger an audible alarm if one is connected. Yellow alarm conditions light the **YELLOW ALARM** LED and trigger an audible alarm if one is connected.



**NOTE:** By default, any failure condition on the integrated-services interface (Adaptive Services PIC) triggers a red alarm.

To configure conditions that trigger alarms and that can occur on any interface of the specified type, include the **alarm** statement at the **[edit chassis]** hierarchy level.

```
[edit chassis]
alarm {
  interface-type {
    alarm-name (red | yellow | ignore);
  }
}
```

**alarm-name** is the name of an alarm.

Related Documentation

- [System-Wide Alarms and Alarms for Each Interface Type on page 571](#)
- [Chassis Conditions That Trigger Alarms on page 530](#)
- [Silencing External Devices Connected to Alarm Relay Contacts on page 574](#)

## Silencing External Devices Connected to Alarm Relay Contacts

---

You can manually silence external devices connected to alarm relay contacts. To silence an external device, press the alarm cutoff button located on the craft interface front panel of the device.

Silencing the device does not remove the alarm messages from the display (if present on the router or switch) or extinguish the alarm LEDs. In addition, new alarms that occur after an external device is silenced reactivate the external device.

### **Related Documentation**

- [Configuring Junos OS to Determine Conditions That Trigger Alarms on Different Interface Types on page 571](#)
- [Configuring the Junos OS to Disable the Physical Operation of the Craft Interface on page 517](#)



## CHAPTER 25

# Examples

- [Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC on page 575](#)
- [Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 576](#)
- [Example: Configuring FPC Error Detection and Self-Healing on T Series Core Routers on page 576](#)

### Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC

The following example shows how to create tunnel interfaces on Packet Forwarding Engine 1 of DPC 4 with 1 Gbps of bandwidth reserved for tunnel services. On a Gigabit Ethernet 40-port DPC, tunnel interfaces coexist with Ethernet interfaces. With this configuration, the Gigabit Ethernet interfaces are **ge-4/1/0** through **ge-4/1/9**. The tunnel interfaces created are **gr-4/1/10**, **pe-4/1/10**, **pd-4/1/10**, **vt-4/1/10** and so on.

```
[edit chassis]
fpc 4 pic 1 {
  tunnel-services {
    bandwidth 1g;
  }
}
```

#### Related Documentation

- [Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC on page 471](#)
- [Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 576](#)
- [Example: Configuring Tunnel Interfaces on the MPC3E on page 64](#)
- [bandwidth \(Tunnel Services\) on page 606](#)
- [tunnel-services \(Chassis\) on page 817](#)

## Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC

---

In this example, you create tunnel interfaces on Packet Forwarding Engine 0 of DPC 4 with 10 Gbps of bandwidth reserved for tunnel traffic. Ethernet and tunnel interfaces cannot coexist on the same Packet Forwarding Engine of a 10-Gigabit Ethernet 4-port DPC. With this configuration, the tunnel interfaces created are **gr-4/0/0**, **pe-4/0/0**, **pd-4/0/0**, **vt-4/0/0** and so on.

```
[edit chassis]
fpc 4 pic 0 {
  tunnel-services {
    bandwidth 10g;
  }
}
```

### Related Documentation

- [Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC on page 575](#)
- [Example: Configuring Tunnel Interfaces on the MPC3E on page 64](#)
- [bandwidth \(Tunnel Services\) on page 606](#)
- [tunnel-services \(Chassis\) on page 817](#)

## Example: Configuring FPC Error Detection and Self-Healing on T Series Core Routers

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This example shows how to configure error detection and self-healing on a Juniper Networks T Series Core Router with Type 5 FPC.

- [Requirements on page 576](#)
- [Overview on page 576](#)
- [Configuration on page 577](#)
- [Verification on page 580](#)

### Requirements

This example uses the following hardware and software components:

- Juniper Networks T4000 Core Router with Type 5 FPCs.
- Junos OS Release 13.3 or later.

Before you proceed, ensure that the required connections are complete and the interfaces are functional.

### Overview

FPC error detection and self-healing involves configuring a set of actions to be performed on each FPC, when the number of errors for a particular severity increases beyond a user-configured threshold. The error severity is categorized into fatal, major, and minor. Recovery actions include raising an alarm, generating log entries, getting the current state of the FPC, restarting the FPC, taking the FPC offline, and resetting the FPC. For a particular

FPC and error severity, you can configure the error threshold to any value within the allowed limits and map the threshold to an action. In this example, you will set these errors on FPC 0 in Juniper Networks T4000 Core Router.

## Configuration

To configure the error detection and self-healing, you need to set the error severity, threshold values corresponding to each error severity, and actions to be performed when the threshold value is crossed.

- [Configuring the Error Detection and Self-Healing on page 578](#)
- [Results on page 580](#)

### CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the [edit interfaces] hierarchy level.

```
set chassis fpc 0 fatal threshold 1 action reset
set chassis fpc 0 major threshold 1 action alarm
set chassis fpc 0 minor threshold 10 action log
```

## Configuring the Error Detection and Self-Healing

### **Step-by-Step Procedure**

The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see *Using the CLI Editor in Configuration Mode* and the *CLI User Guide*.

- Configure the threshold value and associated action for fatal errors.

1. Set the error severity to fatal.

```
[edit interfaces]
```

```
user@host# set chassis fpc 0 error fatal
```

2. Set the threshold value for fatal errors.

```
[edit interfaces]
```

```
user@host# set chassis fpc 0 error fatal threshold 1
```

3. Set the associated action for fatal errors.

```
[edit interfaces]
```

```
user@host# set chassis fpc 0 error fatal threshold 1 action reset
```

- Configure the threshold value and associated action for major errors.

1. Set the error severity to major.

```
[edit interfaces]
```

```
user@host# set chassis fpc 0 error major
```

2. Set the threshold value for major errors.

```
[edit interfaces]
```

```
user@host# set chassis fpc 0 error major threshold 1
```

3. Set the associated action for major errors.

```
[edit interfaces]
```

```
user@host# set chassis fpc 0 error major threshold 1 action alarm
```

- Configure the threshold value and associated action for minor errors.

1. Set the error severity to minor.

```
[edit interfaces]
```

```
[edit interfaces]
```

```
user@host# set chassis fpc 0 error minor
```

2. Set the threshold value for minor errors.

```
[edit interfaces]
```

```
user@host# set chassis fpc 0 error minor threshold 10
```

3. Set the associated action for minor errors.

```
[edit interfaces]
```

```
user@host# set chassis fpc 0 error minor threshold 10 action log
```

## Results

The following is the result of the configuration for the fatal severity level.

```
user@host# set chassis fpc 0 error ?
Possible completions:
+ apply-groups          Groups from which to inherit configuration data
+ apply-groups-except  Don't inherit configuration data from these groups
> fatal                FPC Fatal errors (default threshold = 1)
> major                FPC Major Level errors (default threshold = 1)
> minor                FPC Minor Level errors (default threshold = 10)
user@host# set chassis fpc 0 error fatal action ?
Possible completions:
alarm                  Raise FPC alarm
get-state              Retrieve FPC state for debugging
log                   Log occurrence to system log file
offline               Offline FPC
offline-pic            Offline PICs associated with PFE on FPC
reset                 Reset FPC
user@host# set chassis fpc 0 error fatal action reset
user@host# set chassis fpc 0 error fatal threshold ?
Possible completions:
<threshold>          Error count at which to take the action (0..4294967295)
user@host# set chassis fpc 0 error fatal threshold 1
```

If you are done configuring the devices, enter **commit** from configuration mode.

## Verification

To verify that the configuration is successful and the router is configured with the correct action, use the **show chassis fpc errors** command.

- [Verifying the Configured Actions Related to Fatal Severity of FPC Error on page 580](#)

### Verifying the Configured Actions Related to Fatal Severity of FPC Error

**Purpose** Make sure that the threshold value and the associated action are set for fatal errors.

**Action** user@host> show chassis fpc errors

```
FPC Level Occurred Cleared Threshold Action-Taken Action
0 Fatal 0 0 1 RESET
Pfe-State: pfe-0 -ENABLED | pfe-1 -ENABLED | pfe-2 -ENABLED | pfe-3 -ENABLED
| pfe-4 -ENABLED | pfe-5 -ENABLED | pfe-6 -ENABLED | pfe-7 -ENABLED |
```

**Meaning** The sample output shows **Fatal** error at FPC **0** with **0** error **Occurred** (no previous occurrences), **0** error **Cleared** (no previous occurrences) with **Threshold** value set to **1** and **Action-Taken** set to **RESET**.

- Related Documentation
- [fpc error on page 659](#)
  - [show chassis fpc errors on page 1718](#)





## PART 3

# Configuration Statements and Administrative Commands

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## CHAPTER 26

# Configuration Statements

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## **account-layer2-overhead (PIC Level)**

<b>Syntax</b>	<code>account-layer2-overhead;</code>
<b>Hierarchy Level</b>	<code>[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i>]</code>
<b>Release Information</b>	Statement introduced in Junos OS Release 13.2.
<b>Description</b>	Enable the automatic adjustment of Layer 2 overhead in bytes, which is the octet adjustment per packet, based on the encapsulation on the logical interface for the total octet count for ingress and egress traffic on all the interfaces in the PIC.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Accounting of the Layer 2 Overhead Attribute in Interface Statistics on page 439</a></li> <li>• <a href="#">Configuring Layer 2 Overhead Accounting in Interface Statistics on page 441</a></li> <li>• <a href="#">Verifying the Accounting of Layer 2 Overhead in Interface Statistics on page 443</a></li> </ul>

## action

**Syntax**

```
action {
  alarm;
  disable-pfe;
  get-state;
  log;
  offline;
  reset;
}
```

**Hierarchy Level**

- [edit chassis **fpc** *slot-number* **error fatal**]
- [edit chassis **fpc** *slot-number* **error major**]
- [edit chassis **fpc** *slot-number* **error minor**]
- [edit chassis **error fatal**]
- [edit chassis **error major**]
- [edit chassis **error minor**]

**Release Information** Statement introduced for PTX Series routers in Junos OS Release 13.3.  
Statement introduced for MX240, MX480, MX960 routers in Junos OS Release 14.2.

**Description** Depending on the severity level of an error, you can configure one or more actions for the router to perform. For example, if the severity level of an error is major, you can configure the system to raise an alarm and restart the FPC.



**NOTE:** You cannot configure **disable-pfe** and **offline** actions at the same time.

**Options** **alarm**—Raise an FPC alarm.

**disable-pfe**—(PTX routers) Disable Packet Forwarding Engine interfaces on an FPC.  
(MX240, MX480, MX960, MX2020 routers) Disables the interface associated with the ASIC that raised the error. On MX Series routers, an MPC can have multiple ASICs handled by a single PFE. Disabling the PFE in such cases, is not the optimal way to handle the error.

**get-state**—The system starts collecting statistics counters and other data from the affected FPC. The data is written and saved to a file under **/var** on the routing engine.

**offline**—The system shuts down the affected FPC, thus allowing traffic to be re-routed through interfaces on other FPC in the device.

**reset** —The system restarts the affected FPC.

**log**—Log occurrences to the system log file.

**Required Privilege Level**

**interface**—To view this statement in the configuration.

**interface-control**—To add this statement to the configuration.

**Related Documentation**

- [Fabric Resiliency and Degradation on page 132](#)
- [show chassis fpc errors on page 1718](#)
- [Configuring FPC Error Levels and Actions on page 455](#)

## action-fpc-restart-disable

**Syntax** `action-fpc-restart-disable;`

**Hierarchy Level** `[edit chassis fabric degraded]`

**Release Information**

Statement added in Junos OS Release 11.4.

Statement introduced in Junos OS Release 12.1 for MX240, MX480, and MX960 routers.

Statement introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Routers.

**Description**

Allow the user to disable restarting of the FPCs during healing from a degraded fabric condition. The device can automatically recover from degraded fabric conditions by restarting both the fabric planes and the FPCs. If the **action-fpc-restart-disable** statement is configured, the healing attempt is limited to restarting the fabric planes only.

**Default** The system will detect a blackholing condition and try to heal the system.

**Required Privilege Level**

**interface**—To view this statement in the configuration.

**interface-control**—To add this statement to the configuration.

**Related Documentation**

- [Disabling Line Card Restart to Limit Recovery Actions from Degraded Fabric Conditions on page 144](#)
- [Fabric Resiliency and Degradation on page 132](#)

## adaptive-services

**Syntax**

```
adaptive-services {
  service-package {
    extension-provider {
      control-cores control-number;
      data-cores data-number;
      data-flow-affinity {
        hash-key (layer-3 | layer-4);
      }
      forwarding-db-size size;
      object-cache-size size;
      package package-name;
      policy-db-size size;
      syslog {
        facility {
          severity;
          destination destination;
        }
      }
      wired-max-processes num-procs;
      wired-process-mem-size mem-size;
    }
    layer-2;
    layer-3;
  }
}
```

**Hierarchy Level** [edit chassis fpc *slot-number* pic *pic-number*]

**Release Information** Statement introduced before Junos OS Release 7.4.

**Description** Enable a service package on adaptive services interfaces.

**Options** The remaining statements are explained separately. See [CLI Explorer](#).

**Required Privilege Level** interface—To view this statement in the configuration.  
interface-control—To add this statement to the configuration.

**Related Documentation**

- *Enabling Service Packages*
- *Multiservices MIC and Multiservices MPC (MS-MIC and MS-MPC) Overview*
- *Configuring MS-MPC-Based, Static HTTP Redirect Services*
- *Configuring MS-MPC-Based, Converged HTTP Redirect Services*

## aggregated-ether

<b>Syntax</b>	<code>aggregated ether <i>aggregated-ether-group-name</i>;</code>
<b>Hierarchy Level</b>	<code>[edit chassis synchronization source interfaces ]</code>
<b>Release Information</b>	Statement introduced in Junos OS Release 17.2R1.
<b>Description</b>	Specify an aggregated Ethernet group while configuring a member of the group as the clock source. This is an optional setting. Any number of interfaces from an aggregated Ethernet group can be configured as the clock source. If a member from the aggregated Ethernet group is selected as the locked clock source, then all the members of the group will transmit the Do not Use (DNU) ESMC quality level.
<b>Options</b>	<i>aggregated-ether-group-name</i> —aggregated ethernet group name
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Synchronous Ethernet Overview on page 242</a></li> <li>• <a href="#">show chassis synchronization on page 2153</a></li> </ul>

## aggregate-ports

<b>Syntax</b>	<code>aggregate-ports;</code>
<b>Hierarchy Level</b>	<code>[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i>]</code>
<b>Release Information</b>	Statement introduced in Junos OS Release 8.1.
<b>Description</b>	For T Series routers only, specify OC768-over-OC192 mode on the 4-port OC192C PIC. Four OC192 links are aggregated into one OC768 link with one logical interface.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring 4-Port OC192 PIC to Operate in OC768-over-OC192 Mode</a></li> </ul>

## aggregated-devices

```
Syntax aggregated-devices {
    ethernet {
        device-count number;
        lacp {
            link-protection {
                non-revertive;
            }
            system-priority;
        }
    }
    sonet {
        device-count number;
    }
    maximum-links maximum-links-limit;
}
```

Hierarchy Level [edit chassis]

**Release Information** Statement introduced before Junos OS Release 7.4.  
Support for LACP link protection and system priority introduced in Junos OS Release 9.3.

**Description** Configure properties for aggregated devices on the router. Aggregate Ethernet links are logical interfaces defined on the device that bundle together multiple physical interfaces into a single interface for the use of redundancy and bandwidth aggregation. When interconnecting devices you can create aggregate ethernet interfaces to bundle together multiple physical ethernet links to increase bandwidth and redundancy between devices.

Link aggregation enables you to group Ethernet interfaces to form a single link layer interface. Link Aggregation Control Protocol (LACP) is supported in chassis cluster deployments, where aggregated Ethernet interfaces and redundant Ethernet interfaces are supported simultaneously.

You must first configure the system to enable configuring the Aggregated Ethernet (ae) Interfaces. By default, Juniper devices do not have any aggregated ethernet interfaces created. To configure the device to support a given number of ae interfaces, you must define it on a per chassis basis using the **set chassis aggregated-devices devices {1-32}** in configuration mode. The number of devices you define will be the number of aggregated ethernet interfaces that the system will create which can be configured just like any other ethernet interface. Also you can view the interfaces created by using the **show interface terse** command. Once you have defined the number of aggregated ethernet devices on the chassis you can then continue to configure the LAG members on a per ethernet interface basis.

**Options** The remaining statements are explained separately.

<b>Required Privilege</b>	interface—To view this statement in the configuration.
<b>Level</b>	interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring Junos OS for Supporting Aggregated Devices on page 481</a></li></ul>

## alarm (chassis)

Syntax	<pre>alarm {   interface-type {     alarm-name (ignore   red   yellow);   } }</pre>
Hierarchy Level	<pre>[edit chassis], [edit chassis interconnect-device name], [edit chassis node-group name]</pre>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 12.2 for the ACX Series.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
Description	<p>Configure the chassis alarms and whether they trigger a red or yellow alarm, or whether they are ignored. Red alarm conditions light the <b>RED ALARM</b> LED on either the router's craft interface or the switch's LCD screen and trigger an audible alarm if one is connected to the contact on the craft interface or LCD screen. Yellow alarm conditions light the <b>YELLOW ALARM</b> LED on either the router's craft interface or the switch's LCD screen and trigger an audible alarm if one is connected to the craft interface or LCD screen.</p> <p>To configure more than one alarm, include multiple <i>alarm-name</i> lines.</p>
Options	<p><i>alarm-name</i>—Alarm condition. For a list of conditions, see <a href="#">Table 85 on page 572</a>.</p> <p><i>ignore</i>—The specified alarm condition does not set off any alarm.</p> <p><i>interface-type</i>—Type of interface on which you are configuring the alarm: <b>atm</b>, <b>ethernet</b>, <b>sonet</b>, or <b>t3</b>.</p> <p><b>red</b>—The specified alarm condition sets off a red alarm.</p> <p><b>yellow</b>—The specified alarm condition sets off a yellow alarm.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> <li>• <i>Understanding Alarms</i></li> <li>• <a href="#">Chassis Conditions That Trigger Alarms on page 530</a></li> <li>• <i>Chassis Alarm Messages on a QFX3500 Device</i></li> <li>• <i>Interface Alarm Messages</i></li> </ul>



## allow-sram-parity-errors

<b>Syntax</b>	<code>allow-sram-parity-errors;</code>
<b>Hierarchy Level</b>	<code>[edit chassis fpc <i>slot-number</i>]</code>
<b>Release Information</b>	Statement introduced in Junos OS Release 8.0.
<b>Description</b>	(T Series routers only) Allow SRAM parity errors to occur without restarting the FPC.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.

## announce-timeout

<b>Syntax</b>	<code>announce-timeout <i>announce-timeout-value</i>;</code>
<b>Hierarchy Level</b>	<code>[edit protocols ptp <a href="#">slave</a>]</code>
<b>Release Information</b>	Statement introduced in Junos OS Release 12.2.
<b>Description</b>	Specify the number of announce messages a slave—configured on an ACX Series router—must miss before an announce-timeout is declared. Announce messages are sent by the master to the slave.
<b>Options</b>	<i>announce-timeout-value</i> —The announce timeout value for announce interval messages. <b>Range:</b> 2 through 10 <b>Default:</b> 3
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring Precision Time Protocol on page 319</a></li> <li>• <a href="#">Example: Configuring Precision Time Protocol on page 325</a></li> <li>• <a href="#">Precision Time Protocol Overview on page 256</a></li> </ul>

## announce-interval

---

<b>Syntax</b>	<code>announce-interval <i>announce-interval-value</i>;</code>
<b>Hierarchy Level</b>	<code>[edit protocols ptp <a href="#">master</a>]</code>
<b>Release Information</b>	Statement introduced in Junos OS Release 12.2.
<b>Description</b>	Configure the logarithmic mean interval for the announce messages to be sent by the master. By default, one announce message is sent in every two seconds.
<b>Options</b>	<b><i>announce-interval-value</i></b> —The announce interval value for the announce messages. <b>Range:</b> 0 through 4 <b>Default:</b> 1
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring Precision Time Protocol on page 319</a></li><li>• <a href="#">Example: Configuring Precision Time Protocol on page 325</a></li><li>• <a href="#">Precision Time Protocol Overview on page 256</a></li></ul>

## asymmetry


<b>Syntax</b>	<code>asymmetry <i>number</i></code>
<b>Hierarchy Level</b>	<p>For ACX Series and QFX Series:</p> <pre>[edit protocols ptp slave interface unicast-mode clock-source local-ip-address]</pre> <p>For MX Series:</p> <pre>[edit protocols ptp <i>slave</i> interface <i>interface-name</i> <i>multicast-mode</i>], [edit protocols ptp <i>master</i> interface <i>interface-name</i> <i>multicast-mode</i>]</pre>
<b>Release Information</b>	<p>Statement introduced in Junos OS Release 15.2 for MX Series routers.</p> <p>Statement introduced in Junos OS Release 17.3 for QFX Series switches.</p>
<b>Description</b>	<p>Specify the asymmetry value between the master and the slave. A compensating value for networks in which there is path asymmetry between the 1588v2 slave and master. Specify a positive or negative value that is added to the path delay value from the slave to the master, making the delay symmetric and equal to the path from the master to the slave.</p>
<b>Options</b>	<p><b>number</b>—The asymmetry value is in nanoseconds and can vary from minus (–)100 milliseconds to 100 milliseconds, allowing compensation for up to 1/10 of a second of path asymmetry.</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <i>IEEE 1588v2 Precision Timing Protocol (PTP)</i></li> <li>• <a href="#">Precision Time Protocol Overview on page 256</a></li> <li>• <a href="#">Configuring Precision Time Protocol on page 319</a></li> <li>• <a href="#">Example: Configuring Precision Time Protocol on page 325</a></li> </ul>

## atm-cell-relay-accumulation

---

<b>Syntax</b>	atm-cell-relay-accumulation;
<b>Hierarchy Level</b>	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> ], [edit chassis lcc <i>number</i> fpc <i>slot-number</i> pic <i>pic-number</i> ] (Routing Matrix)
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4.
<b>Description</b>	Configure an Asynchronous Transfer Mode (ATM) Physical Interface Card (PIC) in cell-relay accumulation mode.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring the Junos OS to Use ATM Cell-Relay Accumulation Mode on an ATM1 PIC on page 466</a></li></ul>

## atm-l2circuit-mode

<b>Syntax</b>	<code>atm-l2circuit-mode (cell   aal5   trunk <i>trunk</i>);</code>
<b>Hierarchy Level</b>	<code>[edit chassis fpc slot-number pic pic-number],</code> <code>[edit chassis lcc number fpc slot-number pic pic-number]</code> (Routing Matrix)
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4.
<b>Description</b>	Configure the ATM2 intelligent queuing (IQ) Layer 2 circuit transport mode.
<b>Default</b>	<code>aal5</code>
<b>Options</b>	<p><code>aal5</code>—Tunnel a stream of ATM cells encoded with ATM Adaptation Layer (AAL5) over an IP Multiprotocol Label Switching (MPLS) backbone.</p> <p><code>cell</code>—Tunnel a stream of ATM cells over an IP MPLS backbone.</p> <p><code>trunk <i>trunk</i></code>—Transport ATM cells over an MPLS core network that is implemented on some other vendor switches. Trunk mode can be <b>UNI</b> or <b>NNI</b>.</p>
<div>  <p><b>NOTE:</b> To determine which vendors support Layer 2 circuit trunk mode, contact Juniper Networks Customer Support.</p> </div>	
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring the Junos OS to Enable ATM2 Intelligent Queuing Layer 2 Circuit Transport Mode on page 501</a></li> </ul>

## auto-recovery-disable

---

<b>Syntax</b>	auto-recovery-disable;
<b>Hierarchy Level</b>	[edit chassis fabric degraded]
<b>Release Information</b>	Statement introduced in Junos OS Release 14.2 for TX Matrix Plus routers with 3D SIBs.
<b>Description</b>	Disable the autorecovery option which is used to recover the routing matrix if fabric black-hole condition is detected on links between Packet Forwarding Engines. By default, autorecovery is enabled. If it is disabled, to reenale the autorecovery option, delete the <b>auto-recovery-disable</b> statement from the existing configuration.
<b>Required Privilege Level</b>	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">show chassis fabric faults recovery-actions on page 1403</a></li></ul>

## bandwidth (MPC Bandwidth)

<b>Syntax</b>	<b>bandwidth</b> <i>bandwidth</i> ;
<b>Hierarchy Level</b>	[edit chassis fpc slot]
<b>Release Information</b>	Statement introduced in Junos OS Release 16.1 for MPC8E.
<b>Description</b>	<p>Configure the MPC bandwidth.</p> <p>By default, MPC8E provides a maximum bandwidth of 960 Gbps. You can upgrade MPC8E to provide an increased bandwidth of 1600 Gbps (1.6 Tbps) by using an add-on license. After you purchase the license and configure the <b>bandwidth 1.6T</b> statement, MPC8E provides an increased bandwidth of 1.6 Tbps. After you upgrade the MPC, you can use the <b>show chassis fpc slot detail</b> command to verify the status as shown in the following example:</p> <pre> [edit] user@router# run show chassis fpc 3 detail Slot 3 information:   State                               Online   Temperature                         29   Total CPU DRAM                      3200 MB   ...    Max Power Consumption               1150 Watts   Configured Bandwidth                1600 G   Operating Bandwidth                 1600 G  [edit] user@router# </pre>
<b>Options</b>	<b>bandwidth</b> —Configure the MPC to operate at a specified bandwidth. You can specify <b>1.6T</b> as the value to configure the MPC to operate at a bandwidth of 1.6 Tbps.
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">MPC8E on MX Series Routers Overview on page 37</a></li> <li>• <a href="#">MPC8E</a></li> </ul>

## bandwidth (Tunnel Services)

Syntax	<code>bandwidth <i>bandwidth-value</i>;</code>
Hierarchy Level	<code>[edit chassis fpc <i>slot-number</i> pic <i>number</i> tunnel-services]</code>
Release Information	Statement introduced in Junos OS Release 8.2. Statement introduced in Junos OS Release 12.3X54 for ACX Series routers.
Description	(ACX Series, MX Series 5G Universal Routing Platforms and T4000 Core Routers only) Configure the amount of bandwidth in gigabits per second reserved on each Packet Forwarding Engine for tunnel traffic using tunnel services. Configuring the bandwidth creates a virtual tunnel interface that is represented as <code>lt-&lt;fpc/pic/port&gt;</code> .
Options	<p><i>bandwidth-value</i>—Amount of bandwidth in Gbps to reserve for tunnel traffic using tunnel services:</p> <ul style="list-style-type: none"> <li>On ACX Series routers, the bandwidth values can be <b>1g</b> or <b>10g</b>.</li> <li>On MX Series routers, the bandwidth values can be as follows: <ul style="list-style-type: none"> <li><b>1g</b></li> <li><b>10g</b> through <b>100g</b> in 10 Gbps increments: <b>10g, 20g, 30g, 40g, 50g, 60g, 70g, 80g, 90g, 100g</b></li> <li><b>100g</b> through <b>400g</b> in 100 Gbps increments: <b>100g, 200g, 300g, 400g</b></li> </ul> </li> <li>On T4000 routers, the bandwidth values can be <b>10g</b> through <b>100g</b> in 10 Gbps increments: <b>10g, 20g, 30g, 40g, 50g, 60g, 70g, 80g, 90g, 100g</b>.</li> </ul>



**NOTE:** The bandwidth that you specify determines the port number of the tunnel interfaces that are created. When you specify a bandwidth of **1g**, the port number is always 10. When you specify any other bandwidth, the port number is always 0.



**NOTE:** If you specify a bandwidth that is not compatible with the type of DPCs or MPCs and their respective Packet Forwarding Engine, tunnel services are not activated. For example, you cannot specify 1 gigabit per second bandwidth for a Packet Forwarding Engine on a 10-Gigabit Ethernet 4-port DPC or 16x10GE 3D MPC.


When the tunnel bandwidth is unspecified in the Routing Engine CLI, the maximum tunnel bandwidth for MPC3E is 60G.



**Required Privilege** interface—To view this statement in the configuration.  
**Level** interface-control—To add this statement to the configuration.

- Related Documentation**
- [Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC on page 575](#)
  - *Tunnel Interface Configuration on MX Series Routers Overview*
  - *Configuring Tunnel Interfaces on T4000 Routers*
  - [Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 576](#)
  - [Example: Configuring Tunnel Interfaces on the MPC3E on page 64](#)
  - [tunnel-services \(Chassis\) on page 817](#)

## bandwidth-degradation

<b>Syntax</b>	<pre>bandwidth-degradation {   action (log-only   restart   offline   restart-then-offline);   no-fabric-switchover;   percentage (1-99); }</pre>
<b>Hierarchy Level</b>	[edit chassis fpc slot-numberfabric]
<b>Release Information</b>	Statement introduced in Junos OS Release 15.1.
<b>Description</b>	Configure a FPC to take a specific action once bandwidth degradation reaches a certain percentage to avoid causing a traffic black hole in the chassis.
	<div>  <p><b>NOTE:</b> This configuration statement is mutually exclusive with the <b>offline-on-fabric-bandwidth-reduction</b> statement. If both statements are configured, the commit check fails and returns an error.</p> </div>
<b>Options</b>	<p><b>log-only</b>—A message gets logged in the chassisd and message files when the fabric degradation threshold is reached. No other actions are taken.</p> <p><b>restart</b>—The FPC with a degraded fabric plane is restarted once the threshold is reached.</p> <p><b>offline</b>—The FPC with a degraded fabric plane is taken offline once the threshold is reached. The FPC requires manual intervention to be brought back online. This is the default action if no action attribute configured.</p> <p><b>restart-then-offline</b>—The FPC with a degraded fabric plane is restarted once the threshold is reached, and if fabric plane degradation is detected again within 10 minutes, the FPC is taken offline. The FPC requires manual intervention to be brought back online.</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Managing Bandwidth Degradation on page 143</a></li> <li>• <a href="#">blackhole-action on page 609</a></li> <li>• <a href="#">offline-on-fabric-bandwidth-reduction on page 723</a></li> </ul>

## blackhole-action

<b>Syntax</b>	<code>blackhole-action (log-only   restart   offline   restart-then-offline);</code>
<b>Hierarchy Level</b>	<code>[edit chassis fpc slot-number fabric]</code>
<b>Release Information</b>	Statement introduced in Junos OS Release 15.1.
<b>Description</b>	Configure an FPC to take a specific action when fabric plane degradation reaches 100 percent.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Managing Bandwidth Degradation on page 143</a></li> <li>• <a href="#">bandwidth-degradation on page 608</a></li> </ul>

## cel

<b>Syntax</b>	<pre>cel {   e1 port-number {     channel-group channel-number timeslots slot-number;   } }</pre>
<b>Hierarchy Level</b>	<code>[edit chassis fpc slot-number pic pic-number]</code>
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4.
<b>Description</b>	Configure channelized E1 port and channel specifications.
<b>Options</b>	<p><b>e1 port-number</b>—Any valid E1 port number on the host system.</p> <p>The remaining statements are explained separately.</p>
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 468</a></li> </ul>

## channel-group

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<b>Syntax</b>	<code>channel-group <i>channel-number</i> timeslots <i>slot-number</i>;</code>
<b>Hierarchy Level</b>	<code>[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> ce1 e1 <i>link-number</i>],</code> <code>[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> ct3 port <i>port-number</i> t1 <i>link-number</i>],</code> <code>[edit chassis lcc <i>lcc-index</i> fpc <i>slot-number</i> pic <i>pic-number</i> ce1 e1 <i>link-number</i>],</code> <code>[edit chassis lcc <i>lcc-index</i> fpc <i>slot-number</i> pic <i>pic-number</i> ct3 port <i>port-number</i> t1 <i>link-number</i>]</code>
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4.
<b>Description</b>	Configure the DS0 channel number.
<b>Options</b>	<p><b><i>channel-number</i></b>—DS0 channel group.</p> <p><b>Range:</b> 0 through 7 for DS0 naming, and 0 through 23 for E1 naming.</p> <p><b><i>timeslots slot-number</i></b>—One or more actual time slot numbers allocated.</p> <p><b>Range:</b> 1 through 24 for T1 and 1 through 32 for E1</p> <p><b>Default:</b> All time slots for T1 and all time slots for E1</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 495</a></li><li>• <a href="#">Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 468</a></li></ul>

## channelization

<b>Syntax</b>	channelization;
<b>Hierarchy Level</b>	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> ]
<b>Release Information</b>	Statement introduced in Junos OS Release 11.4.
<b>Description</b>	Enable the DS3/E3 MIC, MIC-3D-16CHE1-T1-CE, and MIC-3D-8CHOC3-4CHOC12 on MX Series routers with Queuing and Enhanced Queuing MPCs (MX-MPC1-3D-Q, MX-MPC2-3D-Q, MX-MPC2-3D-EQ, MPC2E-3D-NG, and MPC3E-3D-NG) or on MX80 routers to function in channelized mode.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring the Junos OS to Enable Channelization on DS3/E3 MIC on page 497</a></li> </ul>

## chassis

<b>Syntax</b>	chassis { ... }
<b>Hierarchy Level</b>	[edit]
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4.
<b>Description</b>	Configure router chassis properties.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.

## chassis (Component Temperature Threshold)

Syntax	<code>chassis [fpc   sib   cb] <i>threshold action to take</i>;</code>
Hierarchy Level	[edit]
Release Information	Statement introduced in Junos OS Release 15.1F3 and 16.1R2 for PTX5000 routers.
Description	The temperature sensor of each component (such as, FPC, SIB, or control board) is set to a predefined threshold. Any of these threshold values can be changed. As the temperature exceeds the threshold, the system attempts to heal the affected zone by increasing the fan speed for the zone in an attempt to lower the temperature. The <b>chassis [fpc sib cb] <i>threshold action to take</i></b> command is used to define the thresholds at which the fans change speeds, the system is shut down, or an alarm is sent.
Default	Each component has its own specific default threshold.
Options	<p><b>fpc</b>—FPC for which you are setting the temperature threshold</p> <p><b>sib</b>—SIB for which you are setting the temperature threshold</p> <p><b>cb</b>—Control board for which you are setting the temperature threshold</p> <p><b><i>threshold</i></b>—Temperature threshold setting, in degrees Celsius</p> <p><b><i>action to take</i></b>—Action that the system should take:</p> <ul style="list-style-type: none"> <li>• <b>fans-on-full-speed</b>—Temperature threshold at which the component's fans run at full speed</li> <li>• <b>fans-to-normal-speed</b>—Temperature threshold at which the component's fans return to normal speed</li> <li>• <b>fire-shutdown</b>—Temperature threshold for the component, which causes the network device to shut down</li> <li>• <b>red-alarm</b>—Temperature threshold at which a red alarm is triggered</li> <li>• <b>yellow-alarm</b>—Temperature threshold at which a yellow alarm is triggered</li> </ul>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> <li>• <a href="#">show chassis environment on page 969</a></li> <li>• <a href="#">show chassis environment fpc on page 1099</a></li> <li>• <a href="#">show chassis environment cb on page 1066</a></li> </ul>

- [show chassis environment sib on page 1271](#)
- [show chassis fan on page 1352](#)

## ambient-temperature

<b>Syntax</b>	<code>chassis ambient-temperature (25C 40C 55C);</code>
<b>Hierarchy Level</b>	<code>[edit chassis]</code>
<b>Release Information</b>	<p>Statement introduced in Junos OS Release 14.1 for PTX Series routers.</p> <p>Statement introduced in Junos OS Release 15.1 for MX Series routers.</p> <p>Statement introduced in Junos OS Release 17.2R1 for EX9200 switches.</p> <p>Statement introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.</p> <p>Statement introduced in Junos OS Release 18.1R1 for EX9251 switches.</p> <p>Command introduced in Junos OS Release 18.2 for EX9253 Switches.</p> <p>Command introduced in Junos OS Release 18.2 for MX10008 Universal Routing Platforms.</p>
<b>Description</b>	<p>Set the chassis ambient temperature and instruct the power manager to allocate power to the line cards according to the ambient temperature value.</p> <p>On system initialization in a PTX Series router, the power manager reads the ambient temperature and allocates power to the line cards according to the power budget policy at that temperature. If the actual power consumption of any line card exceeds the configured value for more than three minutes, the power manager overrides the configured ambient temperature setting of that line card, and resets its ambient temperature to the next higher level and reallocates power according to the new temperature setting. All the overshooting line cards remain in the dynamic ambient temperature mode until the next reboot, or until you override the configured ambient temperature with a CLI command. The power manager then resets the power budget of the FRUs according to the configured ambient temperature setting.</p> <p>When an MX Series router or an EX9200 switch restarts, the system adjusts the power allocation or the provisioned power for the line cards on the basis of the configured ambient temperature. If enough power is not available, a minor chassis alarm is raised. However, the chassis continues to run with the configured ambient temperature. You can configure a new higher ambient temperature only after you make more power available by adding new power supply modules or by taking a few line cards offline. By using the provisioned power that is saved by configuring a lower ambient temperature, you can bring more hardware components online.</p> <p>For MX960 Universal Routing Platform and the MX2000 line of routers, a maximum operating temperature of 40°C is recommended at an altitude of up to 6000 feet above sea level. The router can operate up to a maximum temperature of 46°C at sea level and can be set accordingly.</p>



**NOTE:** If ambient temperature is not set, then the line cards are allocated power according to the default ambient temperature.



<b>Default</b>	<ul style="list-style-type: none"><li>• MX Series routers—40°C</li><li>• PTX Series routers—40°C</li><li>• EX9200 switches—40°C</li><li>• EX9251 switches—40°C</li><li>• EX9253 switches—40°C</li></ul>
<b>Options</b>	<p><b>25C</b> —Set the ambient temperature of the chassis to 25°C</p> <p><b>40C</b> —Set the ambient temperature of the chassis to 40°C</p> <p><b>55C</b> —Set the ambient temperature of the chassis to 55°C</p>
<b>Required Privilege Level</b>	<p>chassis—To view this statement in the configuration.</p> <p>chassis-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Managing Power Allocated to PTX5000 FPCs on the Basis of Chassis Ambient Temperature Configuration on page 101</a></li><li>• <a href="#">Monitoring the Power Consumption of PTX5000 FPCs by Configuring the Ambient Temperature on page 105</a></li><li>• <a href="#">Understanding How Configuring Ambient Temperature Helps Optimize Power Utilization on page 104</a></li></ul>

## clock-class

---

<b>Syntax</b>	<code>clock-class <i>clock-class-value</i>;</code>
<b>Hierarchy Level</b>	[edit protocols ptp <a href="#">slave clock-class-to-quality-level-mapping</a> ]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.2R2.
<b>Description</b>	Configure the clock class to the set ESMC quality level.
<b>Default</b>	Following are the default clock class values for various clocks: <ul style="list-style-type: none"><li>• Boundary clock—248</li><li>• Ordinary clock (master)—52</li><li>• Ordinary clock (slave)—255</li></ul>
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring Hybrid Mode and ESMC Quality Level Mapping on page 329</a></li><li>• <a href="#">Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 333</a></li><li>• <a href="#">Understanding Hybrid Mode on page 288</a></li><li>• <a href="#">Precision Time Protocol Overview on page 256</a></li><li>• <a href="#">Synchronous Ethernet Overview on page 242</a></li></ul>

## clock-class-to-quality-level-mapping

**Syntax**

```
clock-class-to-quality-level-mapping {
  clock-class clock-class-value;
  {
    quality-level ql-value;
  }
}
```

**Hierarchy Level** [edit protocols ptp [slave](#)]

**Release Information** Statement introduced in Junos OS Release 12.2R2.

**Description** Configure the slave to override the default Precision Time Protocol (PTP) clock class to Ethernet Synchronization Message Channel (ESMC) mapping.

The remaining statements are explained separately. See [CLI Explorer](#).

**Required Privilege Level**

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

**Related Documentation**

- [Configuring Hybrid Mode and ESMC Quality Level Mapping on page 329](#)
- [Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 333](#)
- [Understanding Hybrid Mode on page 288](#)
- [Precision Time Protocol Overview on page 256](#)
- [Synchronous Ethernet Overview on page 242](#)

## clock-source (slave)


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Syntax	<pre>clock-source <i>ip-address</i> {     <i>local-ip-address</i> <i>local-ip-address</i>; }</pre>
Hierarchy Level	[edit protocols ptp <i>slave</i> interface <i>interface-name</i> <i>unicast-mode</i> transport]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	Configure the IP address of the master.
Options	<p><i>ip-address</i>—IP address for the master.</p> <p>The remaining statements are explained separately. See <a href="#">CLI Explorer</a>.</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"><li>• <a href="#">Configuring Precision Time Protocol on page 319</a></li><li>• <a href="#">Example: Configuring Precision Time Protocol on page 325</a></li><li>• <a href="#">Precision Time Protocol Overview on page 256</a></li></ul>


## clock-ipv6-source (slave)

Syntax	<pre>clock-ipv6-source <i>master-ipv6-address</i> {     <i>local-ip-address</i> <i>local-ip-address</i>; }</pre>
Hierarchy Level	[edit protocols ptp <i>slave</i> interface <i>interface-name</i> <i>unicast-mode</i> transport]
Release Information	Statement introduced in Junos OS Release 16.1.
Description	Configure the IPv6 address of the master.
Options	<p><i>master-ipv6-address</i>—IPv6 address for the master.</p> <p>The remaining statements are explained separately. See <a href="#">CLI Explorer</a>.</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"><li>• <a href="#">Configuring Precision Time Protocol on page 319</a></li><li>• <a href="#">Example: Configuring Precision Time Protocol on page 325</a></li><li>• <a href="#">Precision Time Protocol Overview on page 256</a></li></ul>

## clock-source (hybrid)

<b>Syntax</b>	<pre>clock-source <i>ip-address</i> {   interface <i>interface1-name</i>;   interface <i>interface2-name</i>; }</pre>
<b>Hierarchy Level</b>	[edit protocols ptp <a href="#">slave hybrid synchronous-ethernet-mapping</a> ]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.2R2.
<b>Description</b>	Configure the IP address of the PTP master and its possible Synchronous Ethernet source interfaces.
<b>Options</b>	<p><b>interface <i>interface1-name</i></b>—Synchronous Ethernet interface traceable to the same PTP master clock.</p> <p><b>interface <i>interface2-name</i></b>—Synchronous Ethernet interface traceable to the same PTP master clock.</p>
<div>  <p><b>NOTE:</b> You must first configure these interfaces at the [edit chassis synchronization] hierarchy level as Synchronous Ethernet sources. For information about configuring the interfaces, see <a href="#">synchronization (MX Series)</a>.</p> </div>	
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring Hybrid Mode and ESMC Quality Level Mapping on page 329</a></li> <li>• <a href="#">Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 333</a></li> <li>• <a href="#">Understanding Hybrid Mode on page 288</a></li> <li>• <a href="#">Precision Time Protocol Overview on page 256</a></li> <li>• <a href="#">Synchronous Ethernet Overview on page 242</a></li> </ul>

## clock-mode

<b>Syntax</b>	clock-mode (boundary   ordinary);
<b>Hierarchy Level</b>	[edit protocols ptp]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.2. Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Metro Routers. Statement introduced in Junos OS Release 17.3 for the QFX Series.
<b>Description</b>	Configure the clock mode as either boundary clock or ordinary clock. The clock mode determines whether the node is going to act as a slave, master, or both. This attribute is mandatory and has no default value.
<b>Options</b>	<b>boundary</b> —The clock mode of the node is a boundary clock where the clock acts as both master and slave.  <div style="border: 1px solid #ccc; padding: 10px; margin: 10px 0;"> <div style="display: flex; align-items: center;">  <div> <p><b>NOTE:</b> A boundary clock is not supported on the ACX Series routers for 12.2.</p> </div> </div> </div> <b>ordinary</b> —The clock mode of the node is a system clock where the clock acts either as a master or as a slave.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring Precision Time Protocol on page 319</a></li> <li>• <a href="#">Example: Configuring Precision Time Protocol on page 325</a></li> <li>• <a href="#">Precision Time Protocol Overview on page 256</a></li> <li>• <i>IEEE 1588v2 Precision Timing Protocol (PTP)</i></li> <li>• <i>Configuring the Precision Time Protocol G.8275.2 Enhanced Profile (Telecom Profile)</i></li> </ul>

## clock-mode (Clock Synchronization)

---

<b>Syntax</b>	clock-mode (auto-select   free-run);
<b>Hierarchy Level</b>	[edit chassis <a href="#">synchronization</a> ]
<b>Release Information</b>	Statement introduced in Junos OS Release 11.2R4 for MX Series routers.
<b>Description</b>	Configure the mode of operation to select the clock source from a free-run local oscillator or from an external qualified clock. On MX240, MX480, and MX960 routers with enhanced MPCs, the free-run clock is provided by a local oscillator. On other MX Series routers, the free-run clock is provided by the SCB.
<b>Default</b>	auto-select
<b>Options</b>	<b>auto-select</b> —Select the best external clock source as a clock source. <b>free-run</b> —Select the free-run local oscillator as a clock source.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">synchronization on page 794</a></li></ul>



## clock-client


<b>Syntax</b>	<code>clock-client <i>ip-address</i>;</code> <code>local-ip-address <i>local-ip-address</i>;</code>
<b>Hierarchy Level</b>	[edit protocols ptp <b>master</b> interface <i>interface-name</i> <b>unicast-mode transport</b> ipv4]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.2. Statement introduced in Junos OS Release 17.3 for the QFX Series.
<b>Description</b>	Configure the IP address of the slave.  The remaining statement is explained separately. See <a href="#">CLI Explorer</a> .
<b>Options</b>	<i>ip-address</i> —The IP address for the slave.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring Precision Time Protocol on page 319</a></li> <li>• <a href="#">Example: Configuring Precision Time Protocol on page 325</a></li> <li>• <a href="#">Precision Time Protocol Overview on page 256</a></li> <li>• <a href="#">Configuring the Precision Time Protocol G.8275.2 Enhanced Profile (Telecom Profile)</a></li> </ul>

## clock-ipv6-client

---

Syntax	<code>clock-ipv6-client <i>slave-ip-address</i>;</code>
Hierarchy Level	[edit protocols ptp <b>master</b> interface <i>interface-name</i> <b>unicast-mode transport</b> ipv4]
Release Information	Statement introduced in Junos OS Release 16.1.
Description	Configure the IPv6 address of the slave.
Options	<i>slave-ip-address</i> —The IPv6 address for the slave.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"><li>• <a href="#">Configuring Precision Time Protocol on page 319</a></li><li>• <a href="#">Example: Configuring Precision Time Protocol on page 325</a></li><li>• <a href="#">Precision Time Protocol Overview on page 256</a></li></ul>

## clock-step

<b>Syntax</b>	clock-step (one-step   two-step);
<b>Hierarchy Level</b>	[edit protocols ptp <b>master</b> ]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.2.
<b>Description</b>	Configure the clock step that determines whether the timing information is sent along with the synchronous message (one-step) only or a subsequent follow-up message (two-step) is received for the sent synchronous message.
<b>Options</b>	<p><b>one-step</b>—One clock step to send timing information along with the synchronous message.</p> <p><b>two-step</b>—Two clock steps to send timing information and receive a subsequent follow-up message.</p>
<div>  <p><b>NOTE:</b> On MX Series routers, the <b>two-step</b> option is supported only for MPC1E and MPC2E line cards. This option is not supported for MPC5E, MPC6E, MPC7E, MPC8E, and MPC9E line cards.</p> </div>	
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring Precision Time Protocol on page 319</a></li> <li>• <a href="#">Example: Configuring Precision Time Protocol on page 325</a></li> <li>• <a href="#">Precision Time Protocol Overview on page 256</a></li> </ul>

## convert-clock-class-to-quality-level

---

<b>Syntax</b>	convert-clock-class-to-quality-level;
<b>Hierarchy Level</b>	[edit protocols ptp <a href="#">slave</a> ]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.2 for ACX Series Universal Metro Routers. Statement introduced in Junos OS Release 12.2R2 for MX Series 5G Universal Routing Platforms.
<b>Description</b>	<p>Configure the slave to enable it to retrieve Ethernet Synchronization Message Channel (ESMC) information from the Precision Time Protocol (PTP) clock class.</p> <p>When this option is set, the outgoing quality level depends on the PTP clock class mapping, irrespective of the clock being configured in hybrid mode or pure PTP mode. This is the default mapping mode of the ESMC quality level value to the clock class.</p>
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring Hybrid Mode and ESMC Quality Level Mapping on page 329</a></li><li>• <a href="#">Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 333</a></li><li>• <a href="#">Precision Time Protocol Overview on page 256</a></li><li>• <a href="#">Synchronous Ethernet Overview on page 242</a></li><li>• <a href="#">Understanding ESMC Quality Level Mapping on page 280</a></li><li>• <a href="#">Understanding Hybrid Mode on page 288</a></li></ul>

## craft-lockout

---

<b>Syntax</b>	craft-lockout;
<b>Hierarchy Level</b>	[edit chassis]
<b>Release Information</b>	Statement introduced in Junos OS Release 8.1.
<b>Description</b>	Disable the physical operation of the craft interface front panel.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring the Junos OS to Disable the Physical Operation of the Craft Interface on page 517</a></li></ul>

## ct3

---

**Syntax**

```
ct3 {  
  port port-number {  
    t1 link-number {  
      channel-group channel-number timeslots slot-number;  
    }  
  }  
}
```

**Hierarchy Level** [edit chassis fpc *slot-number* pic *pic-number*]

**Release Information** Statement introduced before Junos OS Release 7.4.

**Description** Configure channelized T3 port and channel specifications.

**Options** **port** *port-number*—Any valid T3 port number on the host system.

**t1** *link-number*—T1 link.

**Range:** 0 through 27

The remaining statements are explained separately.

**Required Privilege Level** interface—To view this statement in the configuration.  
interface-control—To add this statement to the configuration.

**Related Documentation**

- [Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 495](#)

## degraded

<b>Syntax</b>	<pre>degraded {   action-fpc-restart-disable;   degraded-fabric-detection-enable;   degraded-fpc-bad-plane-threshold <i>number-bad-planes</i>; }</pre>
<b>Hierarchy Level</b>	[edit chassis fabric degraded]
<b>Release Information</b>	<p>Statement introduced in Junos OS Release 11.4.</p> <p>Statement introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Routers.</p>
<b>Description</b>	Configure options that apply to degraded chassis fabric conditions.
<b>Options</b>	The remaining statements are explained separately. See <a href="#">CLI Explorer</a> .
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Fabric Resiliency and Degradation on page 132</a></li> <li>• <a href="#">Disabling Line Card Restart to Limit Recovery Actions from Degraded Fabric Conditions on page 144</a></li> </ul>

## degraded-fabric-detection-enable

---

<b>Syntax</b>	degraded-fabric-detection-enable;
<b>Hierarchy Level</b>	[edit chassis fabric <a href="#">degraded</a> ]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Routers.
<b>Description</b>	Enable detection of an FPC with degraded fabric.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Fabric Resiliency and Degradation on page 132</a></li><li>• <a href="#">Disabling Line Card Restart to Limit Recovery Actions from Degraded Fabric Conditions on page 144</a></li></ul>

## degraded-fpc-bad-plane-threshold

---


<b>Syntax</b>	degraded-fpc-bad-plane-threshold <i>number-bad-planes</i> ;
<b>Hierarchy Level</b>	[edit chassis fabric <a href="#">degraded</a> ]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Routers.
<b>Description</b>	Configure the number of bad planes that indicate an FPC is degraded.
<b>Options</b>	<b>number-bad-planes</b> —Number of bad planes. <b>Range:</b> 4 through 18 <b>Default:</b> 4
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Fabric Resiliency and Degradation on page 132</a></li><li>• <a href="#">Disabling Line Card Restart to Limit Recovery Actions from Degraded Fabric Conditions on page 144</a></li></ul>




## delay-request

<b>Syntax</b>	<code>delay-request <i>delay-request-value</i>;</code>
<b>Hierarchy Level</b>	<code>[edit protocols ptp <a href="#">slave</a>]</code> <code>[edit protocols ptp slave (ACX Series)]</code>
<b>Release Information</b>	Statement introduced in Junos OS Release 12.2. Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Metro Routers.
<b>Description</b>	Configure the logarithmic mean interval in seconds between the delay request messages sent by the slave to the master.
<b>Options</b>	<b><i>delay-request-value</i></b> —The delay request value for the delay request messages. <b>Range:</b> –6 through +6 <b>Default:</b> 0
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring Precision Time Protocol on page 319</a></li> <li>• <a href="#">Example: Configuring Precision Time Protocol on page 325</a></li> <li>• <a href="#">Precision Time Protocol Overview on page 256</a></li> </ul>

## device-count

<b>Syntax</b>	<code>device-count <i>number</i>;</code>
<b>Hierarchy Level</b>	<pre>[edit chassis <a href="#">aggregated-devices ethernet</a>] [edit chassis <a href="#">aggregated-devices sonet</a>]</pre>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement functionality updated in Junos OS Release 14.2, as described below.</p>
<b>Description</b>	<p>Configure the number of aggregated logical devices available to the router.</p> <p>Starting in Junos release 14.2, for MX series routers, aggregate Ethernet interfaces created under a logical system can be individually named. Prior to 14.2, ae interfaces were named automatically (AE1, AE2) etc. upon setting the device count. This change allows administrators to use custom naming schemes. System resources are only allocated for named ae interfaces, regardless of how many were declared in the device count. (In Junos 14.2 and earlier, ae naming occurred automatically up to the number specified for device count, and system resources were allocated whether a given ae interface was used or not.)</p>
<b>Options</b>	<p><i>number</i>—Set the number of aggregated logical devices that will be available for configuration.</p>
	<p> <b>NOTE:</b> Starting with Junos OS Release 13.2, a maximum of 64 aggregated interfaces are supported for link aggregation of SONET/SDH interfaces. In releases before Junos OS Release 13.2, a maximum of 16 aggregated interfaces are supported for link aggregation of SONET/SDH interfaces.</p>
	<p><b>Range:</b> 1 - 496. The upper limit for this value is system specific.</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring Junos OS for Supporting Aggregated Devices on page 481</a></li> <li>• <a href="#">Configuring Aggregated SONET/SDH Interfaces</a></li> </ul>

## disable-grant-bypass


<b>Syntax</b>	disable-grant-bypass;
<b>Hierarchy Level</b>	[edit chassis fabric]
<b>Release Information</b>	Statement introduced in Junos OS Release 16.1.
<b>Description</b>	<p>Disable the fabric grant bypass feature. This feature is used for communication between Packet Forwarding Engines. For instance, when a Packet Forwarding Engine wants to send a packet to another Packet Forwarding Engine (on the same MPC or on a different MPC), a request is sent to the Packet Forwarding Engine across the fabric plane. Only after the request is granted, can the source Packet Forwarding Engine send the packet to the destination Packet Forwarding Engine. Disabling the default behavior controls congestion and thus improves system behavior and performance on MX2010 and MX2020 routers.</p>
	<p> <b>NOTE:</b> After disabling fabric grant bypass feature on the MX2010 and MX2020, you must reboot the router for the changes to take effect. MPC1 (MX-MPC1-3D), MPC2 (MX-MPC2-3D), and the 16-port 10-Gigabit Ethernet MPC (MPC-3D-16XGE-SFP) do not power on after you disable the fabric grant bypass feature and reboot the router.</p>
<b>Default</b>	<p>Enabled for all MPCs on MX2010 and MX2020 routers with Switch Fabric Boards (SFBs). On MX2010 and MX2020 routers with the Switch Fabric Board SFB2, this feature is enabled only on the MPCs, MPC1 (MX-MPC1-3D), MPC2 (MX-MPC2-3D), and the 16-port 10-Gigabit Ethernet MPC (MPC-3D-16XGE-SFP), and disabled on all other MPCs. The feature is disabled on routers with Switch Control Boards (SCBs).</p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Understanding Fabric Grant Bypass on page 146</a></li> <li>• <a href="#">Disabling Fabric Grant Bypass to Control Congestion and Improve Performance on page 147</a></li> <li>• <a href="#">Re-Enabling Fabric Grant Bypass on page 148</a></li> </ul>

## disk-failure-action

---

<b>Syntax</b>	disk-failure-action (halt   reboot);
<b>Hierarchy Level</b>	[edit chassis routing-engine on-disk-failure]
<b>Release Information</b>	Statement introduced in Junos OS Release 9.0.
<b>Description</b>	Configure the Routing Engine to halt or reboot when the Routing Engine hard disk fails.
<b>Options</b>	<b>halt</b> —Specify the Routing Engine to halt. <b>reboot</b> —Specify the Routing Engine to reboot.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring the Junos OS to Enable a Routing Engine to Reboot on Hard Disk Errors on page 509</a></li></ul>

## domain

<b>Syntax</b>	<code>domain <i>domain-value</i>;</code>
<b>Hierarchy Level</b>	[edit protocols ptp]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.2. Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Metro Routers.
<b>Description</b>	Configure multiple independent Precision Time Protocol (PTP) domains.
<div>  <b>NOTE:</b> Only one PTP domain is supported at any given point in time. </div>	
<b>Options</b>	<i>domain-value</i> —The PTP domain value. <b>Range:</b> 0 through 127 <b>Default:</b> 0
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring Precision Time Protocol on page 319</a></li> <li>• <a href="#">Example: Configuring Precision Time Protocol on page 325</a></li> <li>• <a href="#">Precision Time Protocol Overview on page 256</a></li> </ul>

## dynamic-profile-options

---

<b>Syntax</b>	<pre>dynamic-profile-options {   versioning; }</pre>
<b>Hierarchy Level</b>	[edit system]
<b>Release Information</b>	Statement introduced in Junos OS Release 11.4.
<b>Description</b>	<p>Configure global dynamic profile options.</p> <p>The remaining statement is explained separately. Search for a statement in <a href="#">CLI Explorer</a> or click a linked statement in the Syntax section for details.</p>
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <i>Enabling Dynamic Profiles to Use Multiple Versions</i></li></ul>

## e1


---

<b>Syntax</b>	<pre>e1 <i>port-number</i> {   <a href="#">channel-group</a> <i>channel-number</i> timeslots <i>slot-number</i>; }</pre>
<b>Hierarchy Level</b>	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> ce1]
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4.
<b>Description</b>	Configure the channelized E1 port number on the PIC. The range is from 0 through 9.
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 468</a></li></ul>

## e1-options (Clock Synchronization)

<b>Syntax</b>	<pre>e1-options {   framing (g704   g704-no-crc4);   line-encoding (ami   hdb3);   sabit <i>bit</i>; }</pre>
<b>Hierarchy Level</b>	<pre>[edit chassis <a href="#">synchronization</a> interfaces external] [edit chassis <a href="#">synchronization</a> interfaces (external-0/0   external-1/0)]</pre>
<b>Release Information</b>	Statement introduced in Junos OS Release 12.3 for MX Series routers.
<b>Description</b>	Configure the E1 interface options.
<b>Options</b>	The remaining statements are explained separately. See <a href="#">CLI Explorer</a> .
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><a href="#">synchronization on page 794</a></li> </ul>

## egress-policer-overhead

Syntax	<code>egress-policer-overhead bytes;</code>
Hierarchy Level	<code>[edit chassis fpc slot-number pic pic-number]</code>
Release Information	Statement introduced before Junos OS Release 11.1.
Description	<p>Add the specified number of bytes to the actual length of an Ethernet frame when determining the actions of Layer 2 policers, MAC policers, or queue rate limits applied to output traffic on the line card. You can configure egress policer overhead to account for egress <i>shaping</i> overhead bytes added to output traffic on the line card.</p> <p>On M Series and T Series routers, this statement is supported on Gigabit Ethernet Intelligent Queuing 2 (IQ2) PICs and Enhanced IQ2 (IQ2E) PICs. On MX Series routers, this statement is supported for interfaces configured on Dense Port Concentrators (DPCs).</p>
	<div>  <p><b>NOTE:</b> This statement is not supported on Modular Interface Cards (MICs) or Modular Port Concentrators (MPCs) in MX Series routers.</p> </div>
Options	<p><b>bytes</b>—Number of bytes added to a packet exiting an interface.</p> <p><b>Range:</b> 0–255 bytes</p> <p><b>Default:</b> 0</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> <li>• <a href="#">egress-shaping-overhead</a></li> <li>• <a href="#">Policer Overhead to Account for Rate Shaping Overview</a></li> <li>• <a href="#">Example: Configuring Policer Overhead to Account for Rate Shaping</a></li> <li>• <a href="#">Configuring a Policer Overhead on page 473</a></li> <li>• <a href="#">CoS on Enhanced IQ2 PICs Overview</a></li> </ul>



## enhanced-mode (Network Services)

<b>Syntax</b>	enhanced-mode;
<b>Hierarchy Level</b>	[edit chassis network-services]
<b>Release Information</b>	<p>Statement introduced in Junos OS Release 12.3 for T4000 Core Routers with Type 5 FPCs.</p> <p>Statement introduced in Junos OS Release 15.1F3 and 16.1R2 for PTX5000 routers with third-generation FPCs.</p> <p>Statement introduced in Junos OS Release 15.1F6 and 16.1R2 for PTX3000 routers with third-generation FPCs.</p> <p>Statement introduced in Junos OS Release 17.3R1 for PTX1000 routers.</p>
<b>Description</b>	<p>PTX1000, PTX3000 and PTX5000 Routers—When you configure <b>enhanced-mode</b> on PTX series routers, the following features are enabled on the router:</p> <ul style="list-style-type: none"> <li>• Filter-based generic routing encapsulation (GRE) for IPV4 and IPV6 tunneling.</li> <li>• <b>promote gre-key</b> statement for configuring gre-key as one of the matches in a filter.</li> <li>• <b>promote dscp</b> under <b>family inet</b>, and <b>promote traffic-class</b> under <b>family inet6</b> statements for configuring these as one of the matches in a filter. (Added in Junos OS 17.1 for all PTX Series routers with third-generation FPCs.)</li> <li>• <b>gtp-tunnel-endpoint-identifier</b> statement for including hash calculation for IPV4 or IPV6 packets in the GPRS tunneling protocol—Tunnel end point ID (GTP-TEID) field hash calculations.</li> <li>• Wider configuration range for Bidirectional Forwarding Detection (BFD) protocol intervals.</li> <li>• Support for up to two million routes per chassis.</li> <li>• Support for Layer 3 VPN. The <b>vrf-table-label</b> statement is supported. (Added in Junos OS 15.1F5 for PTX5000 routers.)</li> <li>• Support for destination class usage (DCU) and source class usage (SCU) accounting. (Added in Junos OS 15.1F5 for PTX5000 routers.)</li> </ul>



### NOTE:

- When you configure the **enhanced-mode** statement, only third-generation FPCs are allowed to be powered on. All other FPCs are powered off and cannot be brought online.
- When you do not configure the **enhanced-mode** statement, third-generation FPCs do not support the advanced features in the preceding list. Third-generation FPC only provide the same functionality as the first-generation and second-generation FPCs.

- After you configure the **enhanced-mode** statement and commit the configuration, the router must reboot.

---

T4000 Routers—When you configure **enhanced-mode** on T4000 routers, improved virtual private LAN service (VPLS) MAC address learning by supporting up to 262,143 MAC addresses per VPLS routing instance is enabled.

**NOTE:**

- The **enhanced-mode** statement supports up to 262,143 MAC addresses per VPLS routing instance. However, the MAC address learning limit for each interface remains the same (that is, 65,535 MAC addresses).
- After you configure the **enhanced-mode** statement and committing the configuration, you receive a warning message that prompts you to reboot the router. You must reboot the router and then modify the size of the VPLS MAC address table; otherwise, the improved VPLS MAC address learning does not take effect.
- When the T4000 router reboots after the **enhanced-mode** statement is configured, only the T4000 Type 5 FPCs are online while the remaining FPCs are offline.

---

**Default** PTX Series Routers—By default, the **enhanced-mode** statement is disabled.

T4000 Routers—By default, the improved VPLS MAC address learning feature is disabled.

**Required Privilege Level** interface—To view this statement in the configuration.  
interface-control—To add this statement to the configuration.

**Related Documentation**

- [Network Services Mode Overview on page 361](#)
- [show chassis fpc on page 1666](#)
- [mac-table-size](#)
- [show chassis network-services on page 2015](#)

## error

```
Syntax  error {
        (fatal | major | minor) {
            threshold threshold value;
            action (alarm | disable-pfe | offline-pic | log | get-state | offline | reset);
        }
        scope error-scope {
            category category {
                (fatal | major | minor) {
                    threshold threshold value;
                    action (alarm | disable-pfe | log | get-state | offline | reset);
                }
            }
        }
    }
```

**Hierarchy Level** [edit chassis]

**Release Information** Statement introduced in Junos OS Release 13.3 on MX Series routers.

**Description** Configure the threshold at which FPC errors will take the action you configure to be performed by the device. Starting from Junos OS Release 18.1R3, you can configure error thresholds and actions at the error scope and error category levels on MX Series .

Some Juniper devices include an internal framework for detecting and correcting FPC errors that can have the potential to affect services. You can classify FPC errors according to severity, set an automatic recovery action for each severity, and set a threshold (i.e., the number of times the error must occur before the action is triggered).

**Options** You can configure the threshold for the following severity levels:



**NOTE:** You cannot configure the severity level of an error. However you can modify the severity of an error by using the error ID. See

- **fatal**—Fatal error on the FPC. An error that results in blockage of considerable amount of traffic across modules is a fatal error.
- **major**—Major error on the FPC. An error that results in continuing loss of packet traffic but does not affect other modules is a major error.
- **minor**—Minor error on the FPC. An error that results in the loss of a single packet but is fully recoverable is a minor error.
- **threshold *threshold-value***—Configure the threshold value at which to take action. If the severity level of the error is fatal, the action is carried out only once when the total number of errors crosses the threshold value. If the severity level of the error is major,

the action is carried out once after the occurrence crosses the threshold. If the severity level is minor, the action is carried out as many times as the value specified by the threshold. For example, when the severity level is minor, and you have configured the threshold value as 10, the action is carried out after the tenth occurrence.



**NOTE:** You can set the threshold value to 0 for errors with severity level as minor. This implies that no action is taken for that error. You cannot set the threshold value to 0 for errors with severity level as major or fatal.

Default: The error count for fatal and major actions is 1. The default error count for minor actions is 10.

Range: 0—429,496,729

The available detection and recovery actions are as follows:

- **alarm**—Raise an alarm.
- **disable-pfe**—Disable the PFE interfaces on the FPC.
- **get-state**—Get the current state of the FPC.
- **log**—Generate a log for the event.
- **offline**—Take the FPC offline.
- **offline-pic**—Take the PIC (installed in the FPC) offline.
- **reset**—Reset the FPC.



**NOTE:** Starting in Junos OS Release 17.2R1, if you configure the **disable-pfe**, **offline**, **offline-pic** or **reset** action on an MX Series or PTX Series router, the **get-state** action is additionally configured on the router. This means, for example, if you configure the **disable-pfe** action on the router, the router gets both **disable-pfe** and **get-state** actions configured.

- **scope error-scope**—Group the errors of a particular severity into different scopes. Errors belonging to each error scope is further grouped into categories, before thresholds and actions are defined at the group level. The following scopes are available: **board** and **pfe**.
- **category category**—Categorize errors into various subgroups under the scope level. An error category helps you group similar errors belonging to a particular scope and define actions for them at once. This feature eliminates the need for configurations against individual error-ids. Some of the error-categories are **functional**, **io** (input/output errors), **storage** (for example, errors related to HDD, SSD, and flash), **memory** (for example, errors related to static RAM), **processing** (for example, CPU-related errors), and **switch**.

**Required Privilege Level**    **interface**—To view this statement in the configuration.  
   **interface-control**—To add this statement to the configuration.

**Related Documentation**

- [Fabric Resiliency and Degradation on page 132](#)
- [Configuring FPC Error Levels and Actions on page 455](#)
- [fpc error on page 659](#)
- [show chassis fabric errors on page 1406](#)
- [show chassis fpc errors on page 1718](#)

## error-id

<b>Syntax</b>	<pre> error-id {   severity; {     (fatal   major   minor) {     }   }   state {     disable;   } } </pre>
<b>Hierarchy Level</b>	[edit chassis fpc error]
<b>Release Information</b>	Statement introduced in Junos OS Release 18.2R1.
<b>Description</b>	<p>Manage an error by using the error identifier. This feature allows you to disable an error or modify its severity. The <b>disable</b> option allows you to stop the error from being reported in the system until the error is enabled again.</p> <p>An <i>error-id</i>, a unique error identifier, is represented as a Uniform Resource Identifier (URI), and is composed of a module identifier and an error identifier. For example, the error-id <b>"/cpu/0/memory/0/memory-uncorrected-error"</b> indicates an uncorrectable error under CPU memory module instance 0.</p>
<b>Options</b>	<ul style="list-style-type: none"> <li>• <b>severity</b>—Apply a new severity to the error ID. You can apply any of the following severities: <ul style="list-style-type: none"> <li>• <b>fatal</b>—Fatal error on the FPC. An error that results in blockage of considerable amount of traffic across modules is a fatal error.</li> <li>• <b>major</b>—Major error on the FPC. An error that results in continuing loss of packet traffic but does not affect other modules is a major error.</li> <li>• <b>minor</b>—Minor error on the FPC. An error that results in the loss of a single packet but is fully recoverable is a minor error.</li> </ul> </li> <li>• <b>state</b>—By default, an error is in "enabled" state. <ul style="list-style-type: none"> <li>• <b>disable</b>—Disable an error.</li> </ul> </li> </ul>
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Managing FPC Errors on page 456</a></li> <li>• <a href="#">Configuring FPC Error Levels and Actions on page 455</a></li> <li>• <a href="#">fpc error on page 659</a></li> <li>• <a href="#">show chassis fpc errors on page 1718</a></li> </ul>

## esmc-transmit

Syntax	<pre>esmc-transmit {   interfaces (all   <i>interface-name</i>); }</pre>
Hierarchy Level	[edit chassis <a href="#">synchronization</a> ]
Release Information	Statement introduced in Junos OS Release 11.2R4 for MX Series routers.
Description	Enable Ethernet Synchronization Message Channel (ESMC) packet transmission on all the interfaces or on a specific interface.
Options	<p><i>interface-name</i>—Enable ESMC packet transmission on this interface.</p> <p><i>all</i>—Enable ESMC packet transmission on all interfaces.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"><li>• <a href="#">synchronization on page 794</a></li></ul>

## ethernet (Chassis)

---

Syntax	<pre>ethernet {   device-count <i>number</i>;   lacp {     link-protection {       non-revertive;     }     system-priority;   } }</pre>
Hierarchy Level	[edit chassis <a href="#">aggregated-devices</a> ]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 11.4 for EX Series switches.
Description	Configure properties for Ethernet aggregated devices on the router.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"><li>• <a href="#">Configuring Junos OS for Supporting Aggregated Devices on page 481</a></li><li>• <i>Configuring LACP Link Protection of Aggregated Ethernet Interfaces for Switches</i></li></ul>



## family

**Syntax**

```
family {
  inet {
    layer-3;
    layer-4;
    symmetric-hash {
      complement;
    }
  }
  multiservice {
    source-mac;
    destination-mac;
    payload {
      ip {
        layer-3;
        layer-4;
      }
    }
    symmetric-hash {
      complement;
    }
  }
}
```

**Hierarchy Level** [edit chassis fpc *slot-number* pic *pic-number* hash-key]

**Release Information** Statement introduced in Junos OS Release 9.6.

**Description** (MX Series 5G Universal Routing Platforms only) Configure data used in a hash key for a specific protocol family when configuring PIC-level symmetrical load balancing on an 802.3ad Link Aggregation Group.

**Options** **inet**—Configure data used in a hash key for the **inet** protocol family.

**multiservice**—Configure data used in a hash key for the **multiservice** protocol family.

**Required Privilege Level** interface—To view this statement in the configuration.  
interface-control—To add this statement to the configuration.

**Related Documentation**

- [Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 489](#)

## fatal

---

**Syntax**

```
fatal {  
  threshold threshold-value;  
  action {  
    alarm;  
    disable-pfe;  
    get-state;  
    log;  
    offline;  
    reset;  
  }  
}
```

**Hierarchy Level** [edit chassis **fpc** slot-number **error**]

[edit chassis]

**Release Information** Statement introduced for PTX Series routers in Junos OS Release 13.3.  
Statement introduced for MX240, MX480, MX960, and MX2020 routers in Junos OS Release 14.2.

**Description** Severity level of the error. An error that results in blockage of considerable amount of traffic across modules is a fatal error. The severity level of an error cannot be configured by a user.


The other statements are explained separately.

**Required Privilege Level** **interface**—To view this statement in the configuration.  
**interface-control**—To add this statement to the configuration.

**Related Documentation**


- [Fabric Resiliency and Degradation on page 132](#)
- [Configuring FPC Error Levels and Actions on page 455](#)

## feeds (T640, T1600, and T4000 Routers with Six-Input DC Power Supply)

Syntax	<code>feeds number-of-input-feeds;</code>
Hierarchy Level	<code>[edit chassis pem]</code> <code>[edit chassis lcc lcc-number pem]</code> (Routing Matrix)
Release Information	Statement introduced in Junos OS Release 12.1.
Description	<p>Configure the number of input feeds connected to the six-input DC power supply on T640, T1600, or T4000 routers. The value assigned to the <b>feeds</b> statement must be equal to the number of input feeds provided to the power supply.</p> <p>When providing four or five input feeds on standalone routers, you must configure the <b>feeds</b> statement at the <b>[edit chassis pem]</b> hierarchy level. When providing four or five input feeds to an LCC router in a routing matrix, you must configure the <b>feeds</b> statement at the <b>[edit chassis lcc lcc-number pem]</b> hierarchy level.</p> <div style="margin-top: 20px;">  <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>Before configuring input feeds for your router, see the <i>T640 Core Router Hardware Guide</i>, <i>T1600 Core Router Hardware Guide</i>, or <i>T4000 Core Router Hardware Guide</i> for special considerations and for the number of input feeds supported by the router.</li> <li>All power supplies in the router must use the same number of inputs feeds.</li> </ul> </div>
Options	<p><b>Range:</b> 4 through 6</p> <p><b>Default:</b> 6</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> <li><a href="#">Configuring the Six-Input DC Power Supply on T Series Routers on page 110</a></li> </ul>

## fib-local

---

Syntax	fib-local;
Hierarchy Level	[edit chassis fpc <i>fpc-number</i> route-localization]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure the Packet Forwarding Engine on an FPC as FIB-local.  <div> <b>NOTE:</b> At least, one Packet Forwarding Engine must be configured as <b>fib-local</b> for the commit operation to be successful. If you do not configure <b>fib-local</b> for the Packet Forwarding Engine, the CLI displays an appropriate error message and the commit fails.</div>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"><li>• <a href="#">Example: Configuring Packet Forwarding Engine FIB Localization on page 383</a></li></ul>

## fib-remote

---

Syntax	fib-remote;
Hierarchy Level	[edit chassis fpc <i>fpc-number</i> route-localization]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure the Packet Forwarding Engine on an FPC as FIB-remote.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"><li>• <a href="#">Example: Configuring Packet Forwarding Engine FIB Localization on page 383</a></li></ul>

## filter

<b>Syntax</b>	filter;
<b>Hierarchy Level</b>	[edit chassis <a href="#">memory-enhanced</a> ]
<b>Release Information</b>	Statement added in Junos OS Release 11.1.
<b>Description</b>	Enables storing of firewall filters across multiple static RAM (SRAM) segments, resulting in proper utilization of SRAM segments. This feature is useful in routers with small routing tables and large firewall filters. This statement is supported on T Series routers.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels on page 506</a></li></ul>

## flexible-queuing-mode

---

<b>Syntax</b>	<code>flexible-queuing-mode;</code>
<b>Hierarchy Level</b>	[edit chassis]
<b>Release Information</b>	Statement introduced in Junos OS Release 14.1R1 for MX Series Routers.
<b>Description</b>	<p>Enable flexible queuing on a non-HQoS MPCE that is installed in an MPC slot. A maximum of up to 32,000 queues are supported per port and per card, including queues on both ingress and egress interfaces.</p> <p>When flexible queuing is enabled, the non-HQoS MPC is restarted for the changes to take effect and is brought online only if the power required for the queuing component is available in the power entry module (PEM). The MPC remains offline if the PEM cannot meet the power requirement for the queuing component.</p> <p>You can configure flexible queuing even when a non-HQoS MPC is not present in the chassis. The configuration takes effect when a non-HQoS MPC is installed.</p> <p>For more information about the MPCs and the Junos OS release that support this feature, see <a href="#">“Flexible Queuing Mode” on page 45</a>.</p>
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Upgrading non-HQoS MPCs to Support Flexible Queuing on page 46</a></li><li>• <a href="#">Flexible Queuing Mode Overview on page 45</a></li><li>• <a href="#">MPC3E on MX Series Routers Overview on page 23</a></li><li>• <a href="#">MPC5E on MX Series Routers Overview on page 29</a></li><li>• <a href="#">Protocols and Applications Supported by the MPC5E for MX Series Routers</a></li><li>• <a href="#">Upgrading non-HQoS MPCs to Support Flexible Queuing on page 46</a></li></ul>

## force-switch

---

<b>Syntax</b>	force-switch;
<b>Hierarchy Level</b>	[edit chassis synchronization source (external   <i>interface-name</i> )]
<b>Release Information</b>	Statement introduced in Junos OS Release 11.2R4 for MX Series routers.
<b>Description</b>	For MX Series routers operating with Synchronous Ethernet, force a router to use the clock source, provided that the source is enabled and not locked out. Only one configured source may be force-switched.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">synchronization (MX Series) on page 794</a></li></ul>

## fpc (M320, T320, T640 and PTX Series Routers)

```
Syntax  fpc slot-number {
    error {
        [fatal | major | minor] {
            threshold threshold-value;
            action (alarm | disable-pfe | offline-pic | log | get-state | offline | reset);
        }
    }
    optical-options {
        expansion-card {
            fpc fpc-slot;
        }
        express-in {
            fpc fpc-slot;
        }
        tca tca-identifier (enable-tca | no-enable-tca) (threshold number | threshold-24hrs
            number) ;
        wavelength nm{
            switch interface-name{
            }
            wss-express-in fpc-slot;
        }
    }
}

pic pic-number {
    cel {
        el port-number {
            channel-group group-number timeslots slot-number;
        }
    }
    ct3 {
        port port-number {
            tl link-number {
                channel-group group-number timeslots slot-number;
            }
        }
    }
    framing (sdh | sonet);
    idle-cell-format {
        itu-t;
        payload-pattern payload-pattern-byte;
    }
    max-queues-per-interface (8 | 4);
    no-concatenate;
    q-pic-large-buffer (large-scale | small-scale);
}
}
```

Hierarchy Level [edit chassis]



- Release Information** Statement introduced before Junos OS Release 7.4.  
Error statement introduced for PTX Series routers in Junos OS Release 13.3.
- Description** Configure properties for the PICs in individual Flexible PIC Concentrators (FPCs).
- Options** *slot-number*—Slot number in which the FPC is installed.  
**Range:** M320, T640, T1600, T4000, and PTX5000 routers: 0 through 7  
**Range:** PTX3000 routers: 0, 2, 4, 6, 8, 10, 12, 14



**NOTE:** On PTX1000 routers, the FPC number is always 0.

The remaining statements are explained separately.

- Required Privilege Level** interface—To view this statement in the configuration.  
interface-control—To add this statement to the configuration.
- Related Documentation**
- [Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 461](#)
  - [Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized \(Multiplexed\) Mode on page 467](#)
  - [Configuring FPC Error Levels and Actions on page 455](#)

## fpc (MX Series 5G Universal Routing Platforms)

```
Syntax  fpc slot-number {
        inline-services {
            flow-table-size {
                ipv4-flow-table-size units;
                ipv4-flow-table-size units;
                ipv6-extended-attrib;
            }
        }
        ir-mode (R | IR);
        pic number {
            inline-services {
                bandwidth (1g | 10g);
            }
            port-mirror-instance port-mirroring-instance-name-pic-level;
            tunnel-services {
                bandwidth (1g | 10g);
            }
        }
        port-mirror-instance port-mirroring-instance-name-fpc-level;
    }
```

Hierarchy Level [edit chassis]

**Release Information** Statement introduced in Junos OS Release 8.2.  
**port-mirror-instance** option added in Junos OS Release 9.3.  
**ipv6-extended-attrib** option added in Junos OS Release 14.2 for MX Series routers.

**Description** Configure properties for the DPC or MPC and corresponding Packet Forwarding Engines to create tunnel interfaces.

(MX Series Virtual Chassis only) When you configure chassis properties for MPCs installed in a Virtual Chassis member router, statements included at the **[edit chassis member member-id fpc slot slot-number]** hierarchy level apply to the MPC in the specified slot number only on the specified member router in the Virtual Chassis. Statements included at the **[edit chassis fpc slot slot-number]** hierarchy level apply to the MPCs in the specified slot number on *each* member router in the Virtual Chassis.



**BEST PRACTICE:** To ensure that the statement you use to configure MPC chassis properties in an MX Series Virtual Chassis applies to the intended member router and MPC, we recommend that you always include the **member member-ID** option before the **fpc** statement, where **member-id** is 0 or 1 for a two-member MX Series Virtual Chassis.

**Options** **fpc slot-number**—Specify the slot number of the DPC.

**Range:** 0 through 11

**pic number**—Specify the number of the Packet Forwarding Engine. Each DPC includes four Packet Forwarding Engines.

**Range:** 0 through 4

**port-mirror-instance port-mirroring-instance-name-fpc-level**—Associate a port-mirroring instance with the DPC and its corresponding PICs. The port-mirroring instance is configured under the **[edit forwarding-options port-mirroring]** hierarchy level.

The remaining statements are explained separately. Search for a statement in [CLI Explorer](#) or click a linked statement in the Syntax section for details.

**Required Privilege** interface—To view this statement in the configuration.

**Level** interface-control—To add this statement to the configuration.

- Related Documentation**
- [Configuring Port-Mirroring Instances on MX Series 5G Universal Routing Platforms on page 229](#)
  - *Enabling Inline Service Interfaces*
  - *Virtual Chassis Components Overview*

## fpc (TX Matrix and TX Matrix Plus Routers)

<b>Syntax</b>	<pre>fpc slot-number {   pic pic-number {     atm-cell-relay-accumulation;     atm-l2circuit-mode (cell   aal5   trunk <i>trunk</i>);     framing (sdh   sonet);     idle-cell-format {       itu-t;       payload-pattern <i>payload-pattern-byte</i>;     }     max-queues-per-interface (8   4);     no-concatenate;     no-mcast-replication;     q-pic-large-buffer (large-scale   small-scale);   } }</pre>
<b>Hierarchy Level</b>	[edit chassis <i>lcc number</i> ]
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4.
<b>Description</b>	On a TX Matrix or TX Matrix Plus router, configure properties for the PICs in individual FPCs.
<b>Options</b>	<p><b>slot-number</b>—Slot number in which the FPC is installed.</p> <p><b>Range:</b> 0 through 7</p> <p>The remaining statements are explained separately.</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">TX Matrix Router and T640 Router Configuration Overview on page 373</a></li> <li>• <a href="#">TX Matrix Plus Router Configuration Overview on page 397</a></li> <li>• <a href="#">Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 461</a></li> <li>• <a href="#">TX Matrix Router Chassis and Interface Names on page 376</a></li> <li>• <a href="#">TX Matrix Plus Router Chassis and Interface Names on page 402</a></li> </ul>

## fpc error

**Syntax**

```
fpc slot number {
  error {
    (fatal | major | minor) {
      threshold threshold value;
      action (alarm | disable-pfe | offline-pic | log | get-state | offline | reset);
    }
    scope error-scope {
      category category {
        (fatal | major | minor) {
          threshold threshold value;
          action (alarm | disable-pfe | log | get-state | offline | reset);
        }
      }
    }
  }
}
```

**Hierarchy Level** [edit chassis]

**Release Information** Statement introduced in Junos OS Release 13.3 on MX Series, PTX Series, and T Series routers.  
Statement introduced in Junos OS Release 14.2 on M320 routers.

**Description** Configure the threshold at which FPC errors will take the action you configure to be performed by the device. Starting from Junos OS Release 18.1R3, you can configure error thresholds and actions at the error scope and error category levels on MX Series routers.

Some Juniper devices include an internal framework for detecting and correcting FPC errors that can have the potential to affect services. For each FPC on the device, you can classify errors according to severity, set an automatic recovery action for each severity, and set a threshold (i.e., the number of times the error must occur before the action is triggered).

**Options** You can configure the threshold for the following severity levels:

- **fatal**—Fatal error on the FPC. An error that results in blockage of considerable amount of traffic across modules is a fatal error.
- **major**—Major error on the FPC. An error that results in continuing loss of packet traffic but does not affect other modules is a major error.
- **minor**—Minor error on the FPC. An error that results in the loss of a single packet but is fully recoverable is a minor error.



**NOTE:** You cannot configure the severity level of an error.

- **threshold *threshold-value***—Configure the threshold value at which to take action. If the severity level of the error is fatal, the action is carried out only once when the total number of errors crosses the threshold value. If the severity level of the error is major, the action is carried out once after the occurrence crosses the threshold. If the severity level is minor, the action is carried out as many times as the value specified by the threshold. For example, when the severity level is minor, and you have configured the threshold value as 10, the action is carried out after the tenth occurrence.



**NOTE:** You can set the threshold value to 0 for errors with severity level as minor. This implies that no action is taken for that error. You cannot set the threshold value to 0 for errors with severity level as major or fatal.

Default: The error count for fatal and major actions is 1. The default error count for minor actions is 10.

Range: 0—429,496,729

The available detection and recovery actions are as follows:

- **alarm**—Raise an alarm.
- **disable-pfe**—Disable the PFE interfaces on the FPC.



**NOTE:** For PTX Series routers, when an alarm occurs and a **disable-pfe** action is the result, to clear the alarm you must place the FPC offline and then back online.

- **get-state**—Get the current state of the FPC.
- **log**—Generate a log for the event.
- **offline**—Take the FPC offline.
- **offline-pic**—Take the PIC (installed in the FPC) offline.
- **reset**—Reset the FPC.



**NOTE:** Starting in Junos OS Release 17.2R1, if you configure the **disable-pfe**, **offline**, **offline-pic** or **reset** action on an MX Series or PTX Series router, the **get-state** action is additionally configured on the router. This means, for example, if you configure the **disable-pfe** action on the router, the router gets both **disable-pfe** and **get-state** actions configured.

- **scope error-scope**—Group the errors of a particular severity into different scopes. Errors belonging to each error scope is further grouped into categories, before thresholds and actions are defined at the category level. The following scopes are available: **board** and **pfe**.
- **category category**—Categorize errors into various subgroups under the scope level. An error category helps you group similar errors belonging to a particular scope and define actions for them at once. This feature eliminates the need for configurations against individual error-ids. Some of the error-categories are **functional**, **io** (input/output errors), **storage** (for example, errors related to HDD, SSD, and flash), **memory** (for example, errors related to static RAM), **processing** (for example, CPU-related errors), and **switch**.
- **error-id**—Use the error ID to disable an error or modify the error severity associated with that error. An *error-id*, which is a unique error identifier, is represented as a Uniform Resource Identifier (URI). For example, `/cpu/0/memory/0/memory-uncorrected-error` is an error ID that indicates an uncorrectable error under CPU memory module instance 0.

**Required Privilege Level** routing—To view this statement in the configuration.  
routing-control—To add this statement to the configuration.

**Related Documentation**

- [Fabric Resiliency and Degradation on page 132](#)
- [Configuring FPC Error Levels and Actions on page 455](#)
- [show chassis fabric errors on page 1406](#)
- [show chassis fpc errors on page 1718](#)
- [error on page 641](#)

## fpc-feb-connectivity

---

<b>Syntax</b>	<pre>fpc-feb-connectivity {   fpc <i>number</i> feb (<i>slot-number</i>   none); }</pre>
<b>Hierarchy Level</b>	[edit chassis]
<b>Release Information</b>	Statement introduced in Junos OS Release 8.0.
<b>Description</b>	On the M120 router only, configure a connection between any Flexible PIC Concentrator (FPC) and any Forwarding Engine Board (FEB).
<b>Options</b>	<p><b>fpc <i>number</i></b>—Specify the FPC slot number. <b>Range:</b> 0 through 5</p> <p><b>feb <i>slot-number</i></b>—Specify the FEB slot number. <b>Range:</b> : 0 through 5</p> <p><b>none</b>—Disconnect the FPC from the FEB.</p>
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring the Junos OS to Support FPC to FEB Connectivity on M120 Routers on page 432</a></li></ul>



## fpc-offline-on-blackholing

<b>Syntax</b>	fpc-offline-on-blackholing;
<b>Hierarchy Level</b>	[edit chassis fabric degraded]
<b>Release Information</b>	Statement introduced in Junos OS Release 14.2 for TX Matrix Plus routers with 3D SIBs.
<b>Description</b>	Take the FPC offline and raise an alarm if a traffic black-hole condition is detected in the routing matrix. By default, FPCs remain online when a traffic black-hole condition is detected.
<b>Required Privilege Level</b>	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">show chassis alarms on page 925</a></li> </ul>

## fpc-nmi-volt-fail-knob

<b>Syntax</b>	fpc-nmi-volt-fail-knob (enable   disable)
<b>Hierarchy Level</b>	[edit chassis]
<b>Release Information</b>	Statement introduced in Junos OS Release 10.4R15, 11.4R8-S2, 11.4R9, 12.1R8, 12.2R6, 12.3R3-S1, 12.3R4, 13.1R3, and 13.2R1
<b>Description</b>	Enable or disable the non maskable interrupt (NMI) for the voltage failure errors on the flexible pic concentrator (FPC).
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">show chassis fpc on page 1666</a></li> <li>• <a href="#">Configuring Voltage Level Monitoring of FPCs on page 438</a></li> </ul>

## fpc-offline-on-blackholing

---

<b>Syntax</b>	fpc-offline-on-blackholing;
<b>Hierarchy Level</b>	[edit chassis fabric degraded]
<b>Release Information</b>	Statement introduced in Junos OS Release 14.2 for TX Matrix Plus routers with 3D SIBs.
<b>Description</b>	Take the FPC offline and raise an alarm if a traffic black-hole condition is detected in the routing matrix. By default, FPCs remain online when a traffic black-hole condition is detected.
<b>Required Privilege Level</b>	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">show chassis alarms on page 925</a></li></ul>

## fpc-nmi-volt-fail-knob

---


<b>Syntax</b>	fpc-nmi-volt-fail-knob (enable   disable)
<b>Hierarchy Level</b>	[edit chassis]
<b>Release Information</b>	Statement introduced in Junos OS Release 10.4R15, 11.4R8-S2, 11.4R9, 12.1R8, 12.2R6, 12.3R3-S1, 12.3R4, 13.1R3, and 13.2R1
<b>Description</b>	Enable or disable the non maskable interrupt (NMI) for the voltage failure errors on the flexible pic concentrator (FPC).
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">show chassis fpc on page 1666</a></li><li>• <a href="#">Configuring Voltage Level Monitoring of FPCs on page 438</a></li></ul>

## fpc-restart

<b>Syntax</b>	fpc-restart;
<b>Hierarchy Level</b>	[edit chassis fabric degraded]
<b>Release Information</b>	Statement added in Junos OS Release 13.2R6.
<b>Description</b>	Allow the user to restart the FPCs when a traffic black-hole condition is detected in the routing matrix. To enable this feature set the <b>fpc-restart</b> statement at the <b>edit chassis fabric degraded</b> hierarchy level.
<b>Default</b>	FPCs are not restarted when a traffic black-hole condition is detected.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Fabric Resiliency and Degradation on page 132</a></li><li>• <a href="#">Disabling Line Card Restart to Limit Recovery Actions from Degraded Fabric Conditions on page 144</a></li></ul>

## fpc-resync

---

<b>Syntax</b>	fpc-resync;
<b>Hierarchy Level</b>	[edit chassis]
<b>Release Information</b>	Statement introduced in Junos OS Release 10.2.
<b>Description</b>	<p>(On M320, T320, T640, T1600, T4000, TX Matrix, and TX Matrix Plus routers only) When a Flexible PIC Concentrator (FPC) is brought online, resynchronize the sequence numbers of the FPC with the other active FPCs.</p> <div><div></div><div><p><b>NOTE:</b> In order to prevent traffic blackholing, the <code>fpc-resync</code> command will have no effect if a single LMNR based FPC and one or more I-chip FPCs exist in the same chassis.</p></div></div>
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 479</a></li><li>• <i>TX Matrix Router Hardware Guide</i></li></ul>

## framing

<b>Syntax</b>	<code>framing (sdh   sonet);</code>
<b>Hierarchy Level</b>	<code>[edit chassis fpc slot-number pic pic-number],</code> <code>[edit chassis lcc number fpc slot-number pic pic-number]</code> (Routing Matrix)
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4.
<b>Description</b>	On SONET/SDH PICs only, configure the framing type.
<b>Default</b>	<code>sonet</code>
<b>Options</b>	<code>sdh</code> —SDH framing.  <code>sonet</code> —SONET framing.
<b>Required Privilege Level</b>	<code>interface</code> —To view this statement in the configuration. <code>interface-control</code> —To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 461</a></li></ul>

## framing (E1 Options)

<b>Syntax</b>	<code>framing (g704   g704-no-crc4);</code>
<b>Hierarchy Level</b>	[edit chassis <a href="#">synchronization</a> interfaces external e1-options] [edit chassis <a href="#">synchronization</a> interfaces (external-0/0   external-1/0) e1-options]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.3 for MX Series routers.
<b>Description</b>	Configure the framing format for the E1 interface.
<b>Options</b>	<b>g704</b> —Set the G.704 framing format for E1 interfaces. <b>g704-no-crc4</b> —Set the G.704 framing without CRC4 for E1 interfaces.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">synchronization on page 794</a></li> </ul>

## framing (T1 Options)

<b>Syntax</b>	<code>framing (esf   sf);</code>
<b>Hierarchy Level</b>	[edit chassis <a href="#">synchronization</a> interfaces external t1-options] [edit chassis <a href="#">synchronization</a> interfaces (external-0/0   external-1/0) t1-options]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.3 for MX Series routers.
<b>Description</b>	Configure the framing format for the T1 interface.
<b>Options</b>	<b>esf</b> —Set the framing format as extended super frame. <b>sf</b> —Set the framing format as super frame.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">synchronization on page 794</a></li> </ul>

## fru-poweron-sequence

<b>Syntax</b>	<code>fru-poweron-sequence <i>fru-poweron-sequence</i>;</code>
<b>Hierarchy Level</b>	[edit chassis]
<b>Release Information</b>	<p>Statement introduced in Junos OS Release 10.0.</p> <p>Statement introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.</p> <p>Statement introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.</p> <p>Statement introduced in Junos OS Release 12.3 for T640, T1600, and T4000 routers.</p>
<b>Description</b>	<p>(MX Series 5G Universal Routing Platforms only) Configure the power-on sequence for the DPCs in the chassis for routers with the enhanced AC Power Entry Module (PEM).</p> <p>(T640 routers, T1600 routers, T4000 routers, MX2020 routers, and PTX Series packet transport routers) Configure the power-on sequence for Flexible PIC Concentrators (FPCs) installed in the chassis.</p>
<b>Options</b>	(MX Series 5G Universal Routing Platforms only) <i>fru-poweron-sequence</i> —Power-on sequence for the DPCs in the chassis. The numbers indicate the slot number of the DPCs.



**NOTE:** If the power-on sequence is not configured by including the *fru-poweron-sequence* statement, Junos OS uses the `/var/log/poweron_seq.log` file to determine the power-on sequence for the last power-on operation for the DPCs and the same sequence is used. If the `/var/log/boot_seq.log` file, is not available, Junos OS uses the ascending order of the slot numbers of the DPCs as the sequence to power on the DPCs.

(T640 routers, T1600 routers, T4000 routers, MX2020 routers, and PTX Series packet transport routers) *fru-poweron-sequence*—Power-on sequence for the FPCs in the chassis. The numbers indicate the slot number of the FPCs.



**NOTE:**

- If the configured sequence contains invalid numbers, Junos OS considers only the valid numbers in the sequence. The invalid numbers are silently discarded.
- If the power-on sequence is not configured by including the *fru-poweron-sequence* statement, Junos OS uses the ascending order of the slot numbers of the FPCs as the sequence to power on the FPCs.

**Required Privilege Level** interface—To view this statement in the configuration.  
interface-control—To add this statement to the configuration.

**Related Documentation**

- [Redistributing the Available Power by Configuring Power-On Sequence on page 108](#)
- [Configuring Power-On Sequence to Redistribute the Available Power on page 109](#)

---

## frequency-only

---

**Syntax** frequency-only;

**Hierarchy Level** [edit protocols ptp [slave](#)]

**Release Information** Statement introduced in Junos OS Release 12.2.

**Description** Configure frequency synchronization.



**NOTE:** This option is configured only when PTP is used for frequency synchronization and not for phase synchronization.

**Required Privilege Level** routing—To view this statement in the configuration.  
routing-control—To add this statement to the configuration.

**Related Documentation**

- [Configuring Precision Time Protocol on page 319](#)
- [Example: Configuring Precision Time Protocol on page 325](#)
- [Precision Time Protocol Overview on page 256](#)



## global-wait-to-restore

<b>Syntax</b>	<code>global-wait-to-restore <i>minutes</i>;</code>
<b>Hierarchy Level</b>	<code>[edit chassis synchronization]</code>
<b>Release Information</b>	Statement introduced in Junos OS Release 14.2.
<b>Description</b>	<p>Use this statement to configure the global time to wait before opening the interface to receive ESMC messages.</p> <p>When an interface's signal transitions out of the signal fail state, it must be fault-free for the global-wait-to-restore time before it is again considered by the clock selection process.</p> <p>When the ESMC clock's EEC quality level (QL) mode is enabled, it sends a signal failure to the clock selection process during the global wait-to-restore time. After the global wait-to-restore time ends, a new quality level value is sent to the clock selection process.</p> <p>To override the global wait-to-restore time on a specific interface, include the <a href="#">wait-to-restore</a> statement at the <code>[edit chassis source interfaces (external-a   external-b   interface <i>interface-name</i>)]</code> hierarchy level.</p>
<b>Options</b>	<p><b><i>minutes</i></b>—Set the time for the port signal to be up before the port is opened to receive and transmit ESMC messages.</p> <p><b>Range:</b> 0 through 12 minutes</p> <p><b>Default:</b> 5 minutes</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">synchronization (MX Series) on page 794</a></li> <li>• <a href="#">synchronization (PTX Series) on page 802</a></li> <li>• <a href="#">wait-to-restore on page 826</a></li> </ul>

## hash-key (Chassis LAG)

```
Syntax hash-key {
    family {
        inet {
            layer-3;
            layer-4;
            symmetric-hash {
                complement;
            }
        }
        multiservice {
            source-mac;
            destination-mac;
            payload {
                ip {
                    layer-3 (source-ip-only | destination-ip-only);
                    layer-4;
                }
            }
        }
    }
}
```

**Hierarchy Level** [edit chassis fpc slot-number pic pic-number]

**Release Information** Statement introduced in Junos OS Release 9.6.

**Description** (MX Series 5G Universal Routing Platforms only) Configure data used in a hash key for a PIC for symmetrical load balancing on an 802.3ad Link Aggregation Group.

**Options** **family**—Configure data used in a hash key for a protocol family. This statement has the following suboptions:

- **inet**—Configure data used in a hash key for the **inet** protocol family.
- **multiservice**—Configure data used in a hash key for the **multiservice** protocol family.

**Required Privilege Level** interface—To view this statement in the configuration.  
interface-control—To add this statement to the configuration.

**Related Documentation**

- [Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 489](#)

## hold-interval (Clock Synchronization)

<b>Syntax</b>	<pre>hold-interval {   configuration-change <i>seconds</i>;   restart <i>seconds</i>;   switchover <i>seconds</i>; }</pre>
<b>Hierarchy Level</b>	[edit chassis <a href="#">synchronization</a> ]
<b>Release Information</b>	Statement introduced in Junos OS Release 11.2R4 for MX Series routers.
<b>Description</b>	Configure the wait time for clock selection after a change in configuration and after a reboot of the router, and configure the switchover wait time after clock recovery.
<b>Options</b>	<p><b>configuration-change</b>—Set the wait time for clock selection after a change in configuration.  <b>Range:</b> 15 seconds through 60 seconds</p> <p><b>restart</b>—Set the wait time for clock selection after reboot of the router.  <b>Range:</b> 60 seconds through 180 seconds  <b>Default:</b> 120 seconds</p> <p><b>switchover</b>—Set the switchover wait time after clock recovery.  <b>Range:</b> 30 seconds through 60 seconds.  <b>Default:</b> 30 seconds</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">synchronization on page 794</a></li> </ul>

## holdover-mode-disable

---

<b>Syntax</b>	holdover-mode-disable;
<b>Hierarchy Level</b>	[edit chassis <a href="#">synchronization</a> output interfaces external] [edit chassis <a href="#">synchronization</a> output interfaces (external-0/0   external-1/0)]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.3 for MX Series routers.
<b>Description</b>	Disable the holdover mode on the external output interface—external—on SCBE or on the external output interfaces—external-0/0 and external-1/0—on SCBE2.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">synchronization on page 794</a></li></ul>

## hold off time

---

<b>Syntax</b>	hold-off-time <i>time</i> ;
<b>Hierarchy Level</b>	[set chassis <a href="#">synchronization</a> <a href="#">source interfaces</a> ]
<b>Release Information</b>	Statement introduced in Junos OS Release 14.2 for MX Series routers.
<b>Description</b>	Enable hold-off time for Synchronous Ethernet interfaces and external clock source interfaces. If an interface goes down, hold-off time delays short signal failures from being sent to the clock selection process to prevent rapid successive switching.
<b>Options</b>	<b>time</b> —Amount of time in milliseconds that a signal is held before being passed to the clock selection process.  <b>Range:</b> 300–1800 milliseconds  <b>Default:</b> 1000 milliseconds
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring Clock Synchronization Interface on MX Series Routers on page 293</a></li><li>• <a href="#">Ethernet Synchronization Message Channel Overview on page 238</a></li></ul>

## hybrid

**Syntax**

```

hybrid {
  synchronous-ethernet-mapping {
    clock-source ip-address {
      interface interface1-name;
      interface interface2-name;
    }
  }
}

```

**Hierarchy Level** [edit protocols ptp [slave](#)]

**Release Information** Statement introduced in Junos OS Release 12.2R2.

**Description** Configure hybrid mode.

The remaining statements are explained separately. See [CLI Explorer](#).

**Required Privilege Level** routing—To view this statement in the configuration.  
routing-control—To add this statement to the configuration.

**Related Documentation**

- [Configuring Hybrid Mode and ESMC Quality Level Mapping on page 329](#)
- [Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 333](#)
- [Understanding Hybrid Mode on page 288](#)
- [Precision Time Protocol Overview on page 256](#)
- [Synchronous Ethernet Overview on page 242](#)

## hybrid

---

<b>Syntax</b>	hybrid;
<b>Hierarchy Level</b>	[edit protocols ptp slave]
<b>Release Information</b>	Statement introduced in Junos OS Release 17.1R1.
<b>Description</b>	Configure the timing and synchronization feature to operate in Sync-E assisted PTP mode of operation. Sync-E source is used to derive the frequency and PTP is used to derive phase.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Precision Time Protocol Overview on page 256</a></li></ul>

## idle-cell-format

<b>Syntax</b>	<pre>idle-cell-format {   itu-t;   payload-pattern <i>payload-pattern-byte</i>; }</pre>
<b>Hierarchy Level</b>	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> idle-cell-format], [edit chassis lcc <i>number</i> fpc <i>slot-number</i> pic <i>pic-number</i> idle-cell-format] (Routing Matrix)
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4.
<b>Description</b>	For ATM2 PICs only, configure the format of the idle cell header and payload bytes.
<b>Options</b>	<p><b>itu-t</b>—Configure the idle cell header to use the International Telecommunications Union (ITU-T) standard of 0x00000001.</p> <p><b>Default:</b> (4 bytes): 0x00000000</p> <p><b><i>payload-pattern-byte</i></b>—Configure the idle cell payload pattern. The payload pattern byte can range from 0x00 through 0xff.</p> <p><b>Default:</b> cell payload (48 bytes)</p>
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring the Junos OS to Enable Idle Cell Format and Payload Patterns for ATM Devices on page 502</a></li> </ul>

## inet (chassis)

---

<b>Syntax</b>	<pre>inet {   layer-3;   layer-4;   symmetric-hash {     complement;   } }</pre>
<b>Hierarchy Level</b>	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> hash-key family]
<b>Release Information</b>	Statement introduced in Junos OS Release 9.6.
<b>Description</b>	(MX Series 5G Universal Routing Platforms only) Configure data used in a hash key for the <b>inet</b> protocol family when configuring PIC-level symmetrical load balancing on an 802.3ad Link Aggregation Group.
<b>Options</b>	<p><b>layer-3</b>—Include Layer 3 IP data in the hash key.</p> <p><b>layer-4</b>—Include Layer 4 IP data in the hash key.</p> <p><b>symmetric-hash</b>—Configure symmetric hash key with source and destination ports.</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 489</a></li></ul>



## ingress-policer-overhead

<b>Syntax</b>	<code>ingress-policer-overhead bytes;</code>
<b>Hierarchy Level</b>	<code>[edit chassis fpc slot-number pic pic-number]</code>
<b>Release Information</b>	Statement introduced before Junos OS Release 11.1. Statement introduced in Junos OS Release 15.1X49-D30 for vSRX.
<b>Description</b>	<p>Add the configured number of bytes to the length of a packet entering the interface.</p> <p>Configure a policer overhead to control the rate of traffic received on an interface. Use this feature to help prevent denial-of-service (DoS) attacks or to enforce traffic rates to conform to the service-level agreement (SLA). When you configure a policer overhead, the configured policer overhead value (bytes) is added to the length of the final Ethernet frame. This calculated length of frame is used to determine the policer or the rate-limiting action.</p> <p>Traffic policing combines the configured policy bandwidth limits and the burst size to determine how to meter the incoming traffic. If you configure a policer overhead on an interface, Junos OS adds those bytes to the length of incoming Ethernet frames. This added overhead fills each frame closer to the burst size, allowing you to control the rate of traffic received on an interface.</p> <p>You can configure the policer overhead to rate-limit queues and Layer 2 and Layer 3 policers, for standalone (SA) and high-availability (HA) deployments. The policer overhead and the shaping overhead can be configured simultaneously on an interface.</p>



**NOTE:** vSRX supports policer overhead on Layer 3 policers only.

The policer overhead applies to all interfaces on the PIC. In the following example, Junos OS adds 10 bytes of overhead to all incoming Ethernet frames on ports ge-0/0/0 through ge-0/0/4.

```
set chassis fpc 0 pic 0 ingress-policer-overhead 10
```



**NOTE:** vSRX only supports fpc 0 pic 0. When you commit the `ingress-policer-overhead` statement, the vSRX takes the PIC offline and then back online.

You need to craft the policer overhead size to match your network traffic. A value that is too low will have minimal impact on traffic bursts. A value that is too high will rate-limit too much of your incoming traffic.

In this example, the policer overhead of 255 bytes is configured for ge-0/0/0 through ge-0/0/4. The firewall policer is configured to discard traffic when the burst size is over 1500 bytes. This policer is applied to ge-0/0/0 and ge 0/0/1. Junos OS adds 255 bytes to every Ethernet frame that comes into the configured ports. If, during a burst of traffic, the combined length of incoming frames and the overhead bytes exceeds 1500 bytes, the policer starts to discard further incoming traffic.

```
set chassis fpc 0 pic 0 ingress-policer-overhead 255
set interfaces ge-0/0/0 unit 0 family inet policer input overhead_policer
set interfaces ge-0/0/0 unit 0 family inet address 10.9.1.2/24
set interfaces ge-0/0/1 unit 0 family inet policer input overhead_policer
set interfaces ge-0/0/1 unit 0 family inet address 10.9.2.2/24
set firewall policer overhead_policer if-exceeding bandwidth-limit 32k
set firewall policer overhead_policer if-exceeding burst-size-limit 1500
set firewall policer overhead_policer then discard
```

**Options** *bytes*—Number of bytes added to a frame entering an interface.

**Range:** 0–255 bytes

**Default:** 0


```
[edit chassis fpc 0 pic 0]
user@host# set ingress-policer-overhead 10;
```

**Required Privilege Level** interface—To view this statement in the configuration.  
interface-control—To add this statement to the configuration.

**Related Documentation**

- [ingress-shaping-overhead](#)
- [Policer Overhead to Account for Rate Shaping Overview](#)
- [Example: Configuring Policer Overhead to Account for Rate Shaping](#)
- [Configuring a Policer Overhead on page 473](#)
- [CoS on Enhanced IQ2 PICs Overview](#)

## input-current (T4000 Routers)

<b>Syntax</b>	<code>input-current <i>amps-in-each-feed</i>;</code>
<b>Hierarchy Level</b>	[edit chassis pem]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.3.
<b>Description</b>	Configure the amount of input current received in each feed. The value assigned to the <b>input-current</b> statement must be equal to the input current capability of each feed.
	<div>  <p><b>NOTE:</b> Before configuring input current for your router, see the <i>T4000 Core Router Hardware Guide</i> for special considerations.</p> </div>
<b>Options</b>	<p><b>Values:</b></p> <ul style="list-style-type: none"> <li>• 40—Indicates 40 A of input current is received in each feed.</li> <li>• 60—Indicates 60 A of input current is received in each feed.</li> </ul> <p><b>Default:</b> 60 A</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring the Six-Input DC Power Supply on T Series Routers on page 110</a></li> </ul>

## interfaces external

```
Syntax interfaces {
  external/external-0-0/external-1/0 {
    e1-options {
      framing (g704 | g704-no-crc4);
      line-encoding (ami | hdb3);
      sabit bit;
    }
    signal-type (1mhz | 5mhz | 10mhz | 2048khz | t1 | e1);
    t1-options {
      framing (esf | sf);
      line-encoding (ami | b8zs);
    }
    pulse-per-second-enable;
  }
}
```

**Hierarchy Level** [edit chassis [synchronization](#)]

**Release Information** Statement introduced in Junos OS Release 12.3 for MX Series routers.

**Description** Starting from Junos OS Release 12.3, configure options for the external clock source interface—external—for SCBE.

Starting from Junos OS Release 13.3, configure options for the two external clock source interfaces—external-0/0 and external-1/0—for SCBE2.


**Options** The remaining statements are explained separately. See [CLI Explorer](#).

**Required Privilege Level** interface—To view this statement in the configuration.  
interface-control—To add this statement to the configuration.


**Related Documentation**

- [synchronization on page 794](#)

## ipv6-extended-attrib

<b>Syntax</b>	ipv6-extended-attrib;
<b>Hierarchy Level</b>	[edit chassis <b>fpc</b> <i>slot-number</i> inline-services ipv6 flow-table-size]
<b>Description</b>	Enable the inclusion of element ID, 54, fragmentIdentification, and element ID, 64, ipv6ExtensionHeaders, in IPFIX flow templates that are exported to the flow collector
<div>  <b>NOTE:</b> Collection of IPv4 fragmentation IDs occurs automatically without having to configure this setting explicitly. </div>	
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><i>Configuring Inline Active Flow Monitoring Using Routers, Switches or NFX250</i></li> </ul>

## ir-mode

<b>Syntax</b>	<code>ir-mode (IR   R);</code>
<b>Hierarchy Level</b>	<code>[edit chassis fpc slot-number]</code>
<b>Release Information</b>	Statement introduced in Junos OS Release 14.2.
<b>Description</b>	Configure the license mode of the specified enhanced MPC in an MPC slot as IR or R. Setting the license mode enables you to distinguish between an MPC with an IR license and an MPC with an R license after the MPC is installed on the router.
	<div>  <p><b>NOTE:</b> The license mode settings are used only to provide information. You cannot set or alter the license of the MPC when you configure the mode.</p> </div>
<b>Default</b>	<p>The default IR mode is Base. You do not set this configuration statement if Base is the mode of your license. Base mode includes the following features:</p> <ul style="list-style-type: none"> <li>• All Layer 2, Layer 2.5, and Layer 3 features.</li> <li>• Up to 32 Layer 3 routing instances of the virtual routing and forwarding (VRF) instance type.</li> <li>• Up to 2 million routes in the forwarding information base (FIB), provided there is hardware support. (FIB is also known as forwarding table.)</li> <li>• Up to 6 million routes in the routing information base (RIB), also known as routing table.</li> </ul>
<b>Options</b>	<p><b>IR</b>—Configure the license mode IR for an MPC installed in a specified MPC slot. Includes the following features:</p> <ul style="list-style-type: none"> <li>• All Layer 2, Layer 2.5, and Layer 3 features.</li> <li>• Up to 32 Layer 3 routing instances of the virtual routing and forwarding (VRF) instance type.</li> </ul> <p><b>R</b>—Configure the license mode R for an MPC installed in a specified MPC slot. Includes full-scale Layer 2, Layer 2.5, and Layer 3 features. Scale is determined by the hardware capabilities.</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>

- Related Documentation**
- [License Modes for Enhanced MPCs Overview on page 54](#)
  - [Configuring the License Mode for Specific Enhanced MPCs on MX Series Routers on page 55](#)
  - [Viewing the License Mode for MPC Cards on MX Series Routers](#)

## lacp

**Syntax**

```
lacp {
  link-protection {
    non-revertive;
  }
  system-priority priority;
}
```

**Hierarchy Level** [edit chassis aggregated-devices ethernet]

**Release Information** Statement introduced in Junos OS Release 9.3.

**Description** For aggregated Ethernet interfaces only, configure Link Aggregation Control Protocol (LACP) parameters at the global level for use by LACP at the interface level.

**Options** The statements are described separately.

**Required Privilege Level**

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

**Related Documentation**

- [Configuring Junos OS for Supporting Aggregated Devices on page 481](#)

## lcc

```

Syntax  lcc number {
        fpc slot-number {
            pic pic-number {
                atm-cell-relay-accumulation;
                atm-l2circuit-mode (cell | aal5 | trunk trunk);
                framing (sdh | sonet);
                idle-cell-format {
                    itu-t;
                    payload-pattern payload-pattern-byte;
                }
                max-queues-per-interface (8 | 4);
                no-concatenate;
                no-mcast-replication;
            }
        }
        online-expected;
        offline;
    }
    q-pic-large-buffer {
        large-scale;
    }
}

```

Hierarchy Level [edit chassis]

**Release Information** Statement introduced before Junos OS Release 7.4.

**Description** Configure a T640 router (on a routing matrix based on a TX Matrix router) or a T1600 router (on a routing matrix based on a TX Matrix Plus router) or a T4000 router (on a routing matrix based on a TX Matrix Plus router).

**Options** *number*—Specify a T640 router or a T1600 router or a T4000 router on a routing matrix.

**Range:**

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

The remaining statements are explained separately.



**Required Privilege Level** interface—To view this statement in the configuration.  
interface-control—To add this statement to the configuration.

- Related Documentation**
- [TX Matrix Router and T640 Router Configuration Overview on page 373](#)
  - [Using the Junos OS to Configure a T640 Router Within a Routing Matrix on page 378](#)
  - [TX Matrix Plus Router Configuration Overview on page 397](#)
  - [Using the Junos OS to Configure a T1600 or T4000 Router Within a Routing Matrix on page 405](#)
  - *TX Matrix Router Hardware Guide*
  - *TX Matrix Plus Router Hardware Guide*

## lcc-mode

<b>Syntax</b>	<pre>lcc-mode {   lcc <i>lcc_number</i>{     mode <i>mode</i>;   } }</pre>
<b>Hierarchy Level</b>	[edit chassis]
<b>Release Information</b>	Statement introduced in Junos OS Release 13.1 for TX Matrix Plus routers with 3D SIBs.
<b>Description</b>	Set the line-card chassis (LCC) in a routing matrix to function as a T1600 router or a T4000 router. If you set the value of the <b>mode</b> variable as <b>empty</b> , then the line-card chassis goes offline. If the <b>mode</b> statement is not configured, then by default the LCC functions as a T1600 router.
<b>Default</b>	If you do not include the <b>lcc-mode</b> statement, the LCC functions as a T1600 router.
<b>Options</b>	<p><b>lcc <i>number</i></b>—On a TX Matrix Plus router, display hardware information for a specified router (line-card chassis) that is connected to the TX Matrix Plus router.</p> <p>Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> <li>0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.</li> <li>0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.</li> <li>0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> <li>0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> </ul> <p><b>mode <i>mode</i></b>—Configure the LCC to function as a T1600 or a T4000 router. The value of the <i>mode</i> variable can be set as <b>t1600</b>, <b>t4000</b>, or <b>empty</b>.</p>
<b>Required Privilege Level</b>	interface-control
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><i>Overview of a Routing Matrix with a TX Matrix Plus Router</i></li> <li><i>Example: Configuring a Routing Matrix with a TX Matrix Plus Router in Mixed Mode</i></li> </ul>

## led-beacon

<b>Syntax</b>	led-beacon
<b>Hierarchy Level</b>	[edit interfaces <i>interface-name (with port number)</i> ]
<b>Release Information</b>	Statement introduced in Junos OS Release 15.1F3 and 16.1R2 for PTX5000 routers. Statement introduced in Junos OS Release 15.1F6 and 16.1R2 for PTX3000 routers.
<b>Description</b>	This command causes the LED for the specified port to flash green. You can use the command to physically locate a specific optic port on the PIC.



**NOTE:** At the [edit interfaces *interface-name (with port number)*] hierarchy level, you must include the port number as part of the interface name. For example, et-x/y/z(:n).

<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <i>show interfaces detail</i></li> </ul>

## license-mode

<b>Syntax</b>	license-mode IR   R
<b>Hierarchy Level</b>	[edit chassis fpc <i>slot-number</i> ]
<b>Release Information</b>	Statement introduced in Junos OS Release 15.1F3 for PTX Series routers with third-generation FPCs.
<b>Description</b>	Configures the FPC's license mode. This can be used to track the number of PICs configured for a specific mode.
<b>Options</b>	IR—Sets the PIC to LSR mode. R—Sets the PIC to full IP mode.



**NOTE:** Starting in Junos OS Release 16.1R3 for PTX Series routers, the IR and R options are used. For previous releases (starting in Junos OS Release 15.1F3) the Ip (full IP mode) and lsr (LSR mode) options are used.

<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">fpc on page 654</a></li> </ul>

## limited-ifl-scaling

<b>Syntax</b>	limited-ifl-scaling;
<b>Hierarchy Level</b>	[edit chassis network-services enhanced-ip]
<b>Release Information</b>	Command introduced in Junos OS Release 15.1R3 for MX Series routers.
<b>Description</b>	Limits the maximum number of logical interfaces on MX Series routers with MS-DPCs to 64,000 for enhanced IP network services mode.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Limiting the Maximum Number of Logical Interfaces on MX Series Routers With MS-DPCs in Enhanced IP Network Services Mode on page 368</a></li> <li>• <a href="#">Network Services Mode Overview on page 361</a></li> <li>• <a href="#">Configuring Enhanced IP Network Services for a Virtual Chassis</a></li> </ul>

## line-encoding (E1 Options)

<b>Syntax</b>	line-encoding (ami   hdb3);
<b>Hierarchy Level</b>	[edit chassis <a href="#">synchronization</a> interfaces external e1-options] [edit chassis <a href="#">synchronization</a> interfaces (external-0/0   external-1/0) e1-options]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.3 for MX Series routers.
<b>Description</b>	Configure the line encoding format on the E1 interface.
<b>Options</b>	<b>ami</b> —Set the line encoding format as automatic mark inversion.  <b>hdb3</b> —Set the line encoding format as high-density bipolar 3 code.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">synchronization on page 794</a></li> </ul>

## line-encoding (E1 Options)

<b>Syntax</b>	line-encoding (ami   hdb3);
<b>Hierarchy Level</b>	[edit chassis <a href="#">synchronization</a> interfaces external e1-options] [edit chassis <a href="#">synchronization</a> interfaces (external-0/0   external-1/0) e1-options]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.3 for MX Series routers.
<b>Description</b>	Configure the line encoding format on the E1 interface.
<b>Options</b>	<b>ami</b> —Set the line encoding format as automatic mark inversion. <b>hdb3</b> —Set the line encoding format as high-density bipolar 3 code.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">synchronization on page 794</a></li> </ul>

## line-encoding (T1 Options)

<b>Syntax</b>	line-encoding (ami   b8zs);
<b>Hierarchy Level</b>	[edit chassis <a href="#">synchronization</a> interfaces external t1-options] [edit chassis <a href="#">synchronization</a> interfaces (external-0/0   external-1/0) t1-options]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.3 for MX Series routers.
<b>Description</b>	Configure the line encoding format on the T1 interface.
<b>Options</b>	<b>ami</b> —Set the line encoding format as automatic mark inversion. <b>b8zs</b> —Set the line encoding format as 8-bit zero suppression.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">synchronization on page 794</a></li> </ul>



## linerate-mode

<b>Syntax</b>	<code>linerate-mode;</code>
<b>Hierarchy Level</b>	<code>[edit chassis fpc slot-number pic pic-number linerate-mode],</code> <code>[edit chassis lcc number fpc slot-number pic pic-number linerate-mode]</code> (Routing Matrix)
<b>Release Information</b>	Statement introduced in Junos OS Release 10.1.
<b>Description</b>	For 10-port 10-Gigabit Oversubscribed Ethernet (OSE) PICs only, configure the line rate operation.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <i>Junos OS Network Interfaces Library for Routing Devices</i></li> </ul>

## link-protection (Protocols LACP)

<b>Syntax</b>	<code>link-protection {</code> <code>non-revertive;</code> <code>}</code>
<b>Hierarchy Level</b>	<code>[edit chassis aggregated-devices ethernet lacp]</code>
<b>Release Information</b>	Statement introduced in Junos OS Release 9.3.
<b>Description</b>	Enable LACP link protection at the global (chassis) level.
<b>Options</b>	The remaining statements are explained separately. See <a href="#">CLI Explorer</a> .
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring Junos OS for Supporting Aggregated Devices on page 481</a></li> </ul>

## lite-mode

Syntax	lite-mode;
Hierarchy Level	[edit chassis fpc 0]
Release Information	Statement introduced in Junos OS Release 15.1F4 and 16.1R1 for vMX routers.
Description	<p>(vMX routers only) Enables vMX to run in lite mode and disables performance mode. Lite mode needs fewer vCPUs and memory to run at lower bandwidth. If you are using paravirtualized network interfaces such as virtio (for KVM) or VMXNET3 (for VMware) for lab simulation use cases, you can enable lite mode.</p> <p>.....</p> <p> <b>NOTE:</b> Make sure you have configured the proper number of vCPUs and memory for your VMs based on your use case. If you have not configured enough vCPUs for performance mode, vMX runs in lite mode.</p> <p>.....</p> <p>Starting with Junos OS Release 15.1F6, performance mode is enabled by default for vMX.</p> <p>.....</p> <p> <b>NOTE:</b> The FPC reboots if you change this configuration.</p> <p>.....</p>
Options	<p><b>lite-mode</b>—Enables lite mode.</p> <p>To disable lite mode, enable performance mode by including the <b>performance-mode</b> statement at the [edit chassis fpc 0] hierarchy level.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> <li>• <a href="#">performance-mode on page 732</a></li> </ul>




## local-ip-address (master)


Syntax	<code>local-ip-address <i>local-ip-address</i>;</code>
Hierarchy Level	[edit protocols ptp <b>master</b> interface <i>interface-name</i> <b>unicast-mode clock-client</b> <i>ip-address</i> ]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	The IP address of the interface acting as a master.
Options	<b><i>local-ip-address</i></b> —IP address of the interface.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"><li>• <a href="#">Configuring Precision Time Protocol on page 319</a></li><li>• <a href="#">Example: Configuring Precision Time Protocol on page 325</a></li><li>• <a href="#">Precision Time Protocol Overview on page 256</a></li></ul>

## local-ip-address (slave)

---

Syntax	<code>local-ip-address <i>local-ip-address</i>;</code>
Hierarchy Level	<code>[edit protocols ptp <b>slave</b> interface <i>interface-name</i> <b>unicast-mode</b> <b>clock-source</b> <i>ip-address</i>]</code>
Release Information	Statement introduced in Junos OS Release 12.2.
Description	Configure the IP address of the interface acting as the slave.  <div> <b>NOTE:</b> You must configure the same IP address at the <code>[edit interfaces <i>interface-name</i>]</code> hierarchy level.</div>
Options	<b><i>local-ip-address</i></b> —The IP address of the interface.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"><li>• <a href="#">Configuring Precision Time Protocol on page 319</a></li><li>• <a href="#">Example: Configuring Precision Time Protocol on page 325</a></li><li>• <a href="#">Precision Time Protocol Overview on page 256</a></li></ul>

## local-priority

Syntax	<code>local-priority <i>local priority-value</i>;</code>
Hierarchy Level	<pre>[edit protocols ptp ] [edit protocols ptp master interface <i>interface-name</i> multicast-mode] [edit protocols ptp master interface <i>interface-name</i> unicast-mode] [edit protocols ptp slave interface <i>interface-name</i> multicast-mode] [edit protocols ptp slave interface <i>interface-name</i> unicast-mode] [edit protocols ptp stateful interface <i>interface-name</i> multicast-mode] [edit protocols ptp stateful interface <i>interface-name</i> unicast-mode]</pre>
Release Information	<p>Statement introduced in Junos OS Release 17.1R1.</p> <p>Statement introduced in Junos OS Release 17.4R1.</p>
Description	<p> <b>NOTE:</b> The stateful statement is not supported on QFX Series switches that support PTP.</p> <p>Configure a clock's local priority to be used as a tie-breaker in the dataset comparison algorithm, in the event that all other previous attributes of the datasets being compared are equal. The dataset comparison algorithm compares one clock with another by using the datasets representing those clocks, appended with the <b>local-priority</b> attribute. The local priority is assigned to the local clock and is used if needed when the data associated with the local clock is compared with data on another potential grandmaster (or the master) clock.</p>
Options	<p><b>local priority-value</b>—The priority value of the clock.</p> <p><b>Range:</b> 1 through 255</p> <p><b>Default:</b> 128</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> <li>• <a href="#">Precision Time Protocol Overview on page 256</a></li> <li>• <a href="#">Configuring the Precision Time Protocol G.8275.2 Enhanced Profile (Telecom Profile)</a></li> </ul>

## major

---

**Syntax**

```
major {  
  threshold threshold-value;  
  action {  
    alarm;  
    disable-pfe;  
    get-state;  
    log;  
    offline;  
    reset;  
  }  
}
```

**Hierarchy Level** [edit chassis **fpc** slot-number **error**]

[edit chassis]

**Release Information** Statement introduced for PTX Series routers in Junos OS Release 13.3.  
Statement introduced for MX240, MX480, MX960, and MX2020 routers in Junos OS Release 14.2.

**Description** Severity level of the error. An error that results in continuing loss of packet traffic but does not affect other modules is a major error. The severity level of an error cannot be configured by a user.

The other statements are explained separately.

**Required Privilege Level** **interface**—To view this statement in the configuration.  
**interface-control**—To add this statement to the configuration.

**Related Documentation**

- [Fabric Resiliency and Degradation on page 132](#)
- [show chassis fpc errors on page 1718](#)
- [Configuring FPC Error Levels and Actions on page 455](#)

## master

List of Syntax [MX Series on page 699](#)  
[QFX Series on page 699](#)

**MX Series**

```
master {
  announce-interval announce-interval-value;
  clock-step (one-step | two-step);
  sync-interval sync-interval-value;
  interface interface-name {
    unicast-mode {
      transport ipv4;
      clock-client ip-address {
        local-ip-address local-ip-address;
      }
    }
  }
  multicast-mode {
    local-priority
    transport 802.3 link-local;
  }
}
```

**QFX Series**

```
master {
  interface interface-name {
    unicast-mode {
      transport ipv4;
      clock-client ip-address {
        local-ip-address local-ip-address;
      }
    }
  }
  multicast-mode {
    transport (ipv4 | ieee-802.3)
    local-ip-address local-ip-address;
    local-priority local-ip-address;
  }
  max-announce-interval max-announce-interval;
  max-delay-response-interval max-delay-response-interval;
  max-sync-interval max-sync-interval;
  min-announce-interval min-announce-interval;
  min-delay-response-interval min-delay-response-interval;
  min-sync-interval min-sync-interval;
  sync-interval sync-interval;
}
```

**Hierarchy Level** [edit protocols ptp]

**Release Information** Statement introduced in Junos OS Release 12.2.

Statement introduced in Junos OS Release 17.3 for the QFX Series.

**Description** Configure the master with parameters.



The remaining statements are explained separately. See [CLI Explorer](#).

**Required Privilege Level** routing—To view this statement in the configuration.  
routing-control—To add this statement to the configuration.

**Related Documentation**

- [Configuring Precision Time Protocol on page 319](#)
- [Example: Configuring Precision Time Protocol on page 325](#)
- [Precision Time Protocol Overview on page 256](#)
- [Configuring the Precision Time Protocol G.8275.2 Enhanced Profile \(Telecom Profile\)](#)

## maximum-ecmp



Syntax	<code>maximum-ecmp <i>next-hops</i>;</code>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 10.1.
Description	<p>(M10i routers with Enhanced CFEB, and M320, M120, MX Series, and T Series routers) Configure 16, 32, or 64 ECMP next hops for RSVP or LDP LSPs, or MPLS static LSPs that are configured using <b>set protocols mpls static-label-switched-path</b>.</p> <p>This command is used to control the maximum number of ECMP legs in an NH. This command applies to all protocols, and the maximum configurable ECMP next hops are chassis dependent.</p> <p> <b>NOTE:</b> MX Series routers with one or more Modular Port Concentrator (MPC) cards and with Junos OS 11.4 or earlier installed, support the configuration of the <code>maximum-ecmp</code> statement with only 16 next hops. You should <i>not</i> configure the <code>maximum-ecmp</code> statement with 32 or 64 next hops. When you commit the configuration with 32 or 64 next hops, the following warning message appears:</p> <p><b>Error: Number of members in Unilist NH exceeds the maximum supported 16 on Trio.</b></p>
Default	16
Options	<p><b><i>next-hops</i></b>—Specify the number of next hops (16, 32, or 64) for RSVP or LDP LSPs, or MPLS static LSPs.</p> <p>The following types of routes support next hops with up to 64 ECMP gateways:</p> <ul style="list-style-type: none"> <li>• RSVP routes in inet tables where multiple RSVP LSPs are created to the same destination. In the case where LSP path protection or FRR is configured, the combination of active, backup and FRR next-hops is a maximum of 64.</li> <li>• LDP routes in inet.3 and mpls.0 where the associated IGP route contains 64 next-hop gateways.</li> <li>• ISIS, OSPF, iBGP, eBGP and Static routes in inet and inet6 tables.</li> </ul> <p> <b>NOTE:</b> These routes also include routes in routing-instances (<code>foo.inet.0</code>).</p>

**Required Privilege** interface—To view this statement in the configuration.  
**Level** interface-control—To add this statement to the configuration.


**Related Documentation** • [Configuring ECMP Next Hops for RSVP and LDP LSPs for Load Balancing on page 487](#)




## maximum-links

Syntax	<code>maximum-links <i>maximum-links-limit</i>;</code>
Hierarchy Level	[edit chassis <a href="#">aggregated-devices</a> ]
Release Information	<p>Statement introduced in Junos OS Release 11.1 for T Series routers.</p> <p>Statement introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport Routers.</p> <p>Statement introduced in Junos OS Release 12.3 for MX Series routers.</p>
Description	<p>Configure the maximum links limit for aggregated devices. Note that for MX Series routers, to set a range of 32 or 64 the router must be running in Enhanced IP mode, which is only supported for Trio-based MPCs and multiservice DPCs (MS-DPCs). For more information on Enhanced IP mode, "<a href="#">Network Services Mode Overview</a>" on page 361.</p> <p>For MX series routers and PTX series switches, the option for 64 links is only supported for Junos OS release 12.3 and later.</p>
	<p> <b>NOTE:</b> This statement is not supported on the MX80, MX104, and PTX1000 routers.</p>
Options	<p><i>maximum-links-limit</i>—Maximum links limit for aggregated devices.</p> <p><b>Range:</b> 16, 32, 64</p>
	<p> <b>NOTE:</b> On T-Series routers, the maximum-links supported is 32 in an aggregated Ethernet link.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> <li>• <a href="#">Network Services Mode Overview on page 361</a></li> <li>• <a href="#">Configuring Junos OS for Supporting Aggregated Devices on page 481</a></li> <li>• <a href="#">Configuring an Aggregated Ethernet Interface</a></li> <li>• <a href="#">network-services on page 716</a></li> </ul>

## max-queues-per-interface

<b>Syntax</b>	<code>max-queues-per-interface (8   4);</code>
<b>Hierarchy Level</b>	<code>[edit chassis fpc slot-number pic pic-number],</code> <code>[edit chassis lcc number fpc slot-number pic pic-number]</code> (Routing Matrix)
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4. Support for TX Matrix and TX Matrix Plus added in Junos OS Release 9.6. On MIC or MPC interfaces on MX Series routers, configure eight egress queues.
<b>Description</b>	On IQ, MPC, and DPC interfaces on M120, T320, T640, T1600, TX Matrix, and TX Matrix Plus routers, or on MIC or MPC interfaces on MX Series routers, configure eight egress queues.
<div>  <b>NOTE:</b> Changing the <code>max-queues-per-interface</code> statement restarts the MPC.         </div>	
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring the Junos OS to Support Eight Queues on IQ Interfaces for T Series and M320 Routers on page 434</a></li> <li>• <i>Configuring Up to 16 Custom Forwarding Classes</i></li> <li>• <i>Enabling Eight Queues on ATM Interfaces</i></li> <li>• <i>Configuring the Maximum Number of Queues for Trio MPC/MIC Interfaces</i></li> <li>• <i>Example: Configuring CoS on SRX5000 Devices with an MPC</i></li> <li>• <i>Example: Enabling Eight-Queue Class of Service on Redundant Ethernet Interfaces on SRX Series Devices in a Chassis Cluster</i></li> </ul>

## max-transmit-quality-level

<b>Syntax</b>	max-transmit-quality-level;
<b>Hierarchy Level</b>	[edit chassis <a href="#">synchronization</a> ]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.3 for MX Series routers.
<b>Description</b>	Configure the threshold quality level for the router. If the received quality level is below the threshold quality level, then the router will send out a received quality level of SEC. The available quality levels are listed in <a href="#">Table 56 on page 271</a> .
	<p>.....</p> <div>  <p><b>NOTE:</b> For GPS external output, when you configure the maximum transmit quality level as PRC and the router is rebooted, no valid output is obtained from SCBE. However, when the maximum transmit quality level is configured to any other quality level other than PRC and the router gets rebooted, then the SCBE works normally.</p> </div> <p>.....</p>
<b>Options</b>	<i>quality-level</i> —The available quality levels are as given in <a href="#">Table 56 on page 271</a> .

*Table 86: Quality Levels*

Quality Level	Description
prc	Timing quality of a primary reference clock (option-1 only).
prs	Clock traceable to a primary reference source (option-2 only).
sec	Timing quality of an SDH equipment clock (option-1 only).
smc	Clock traceable to a self-timed SONET (option-2 only).
ssu-a	Timing quality of a type I or IV slave clock (option-1 only).
ssu-b	Timing quality of a type VI slave clock (option-1 only).
st2	Clock traceable to Stratum 2 (option-2 only).
st3	Clock traceable to Stratum 3 (option-2 only).
st3e	Clock traceable to Stratum 3E (option-2 only).
st4	Clock traceable to Stratum 4 free-run (option-2 only).
stu	Clock traceable to an unknown quality (option-2 only).
tnc	Clock traceable to a transit node clock (option-2 only).

**Required Privilege Level** interface—To view this statement in the configuration.  
 interface-control—To add this statement to the configuration.

**Related Documentation**

- [synchronization on page 794](#)

## member

<b>Syntax</b>	<pre>member <i>member-id</i> {     fabric-tree-root;     location <i>location</i>;     mastership-priority <i>number</i>;     no-management-vlan;     serial-number <i>serial-number</i>;     role <i>role</i>; }</pre>
<b>Hierarchy Level</b>	[edit virtual-chassis]
<b>Release Information</b>	<p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 13.2X50-D15 for the QFX Series.</p> <p>Statement introduced in Junos OS Release 13.2X51-D20 for Virtual Chassis Fabric (VCF).</p>
<b>Description</b>	Configure a switch or an XRE200 External Routing Engine as a member of a Virtual Chassis or a Virtual Chassis Fabric (VCF) with characteristics specified by the available options.
<b>Default</b>	<p>When an EX Series switch or a QFX Series devices configured in standalone mode is powered on but not interconnected through its Virtual Chassis ports (VCPs) with other member switches, its default member ID is 0.</p> <p>There is no default member ID in an EX8200 or EX9200 Virtual Chassis. An EX8200 or EX9200 Virtual Chassis must be preprovisioned, and that process configures the member IDs.</p>
<b>Options</b>	<p><b><i>member-id</i></b>—Identifies a specific member switch of a Virtual Chassis or VCF configuration.</p> <p>The exact range for a specific Virtual Chassis or VCF depends on the number of switches allowed in the Virtual Chassis or VCF.</p> <p>In an EX8200 Virtual Chassis, member IDs 0 through 7 are reserved for EX8200 member switches and member IDs 8 and 9 are reserved for the master and backup external Routing Engines.</p> <p>The remaining statement options set characteristics of the Virtual Chassis or VCF member, and are explained separately.</p>
<b>Required Privilege Level</b>	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <i>Autoprovisioning a Virtual Chassis Fabric</i></li> <li>• <i>Preprovisioning a Virtual Chassis Fabric</i></li> </ul>

- *Adding a Device to a Virtual Chassis Fabric*
- *Configuring a QFX Series Virtual Chassis*
- *Configuring an EX2300, EX3400, or EX4300 Virtual Chassis*
- *Configuring EX4600 Switches in a Mixed or Non-Mixed Virtual Chassis*
- *Configuring an EX9200 Virtual Chassis*
- *Configuring a QFX Series Virtual Chassis*

## memory-enhanced

**Syntax**

```
memory-enhanced {
  filter;
  route;
  vpn-label;
}
```

**Hierarchy Level** [edit chassis]

**Release Information** Statement added in Junos OS Release 10.4.

**Description** Allocate more jtree memory for routing tables and Layer 3 VPNs.



**NOTE:** The `memory-enhanced` statement supports MX Series routers with DPC (I-chip based) line cards only.

The remaining statements are explained separately.

**Required Privilege Level**

interface	—To view this statement in the configuration.
interface-control	—To add this statement to the configuration.

**Related Documentation**

- [Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels on page 506](#)

## minor

**Syntax**

```
minor {
  threshold threshold-value;
  action {
    alarm;
    disable-pfe;
    get-state;
    log;
    offline;
    reset;
  }
}
```

**Hierarchy Level** [edit chassis [fpc slot-number error](#)]

[edit chassis]

**Release Information** Statement introduced for PTX Series routers in Junos OS Release 13.3.  
Statement introduced for MX240, MX480, MX960, and MX2020 routers in Junos OS Release 14.2.

**Description** Severity level of the error. An error that results in the loss of a single packet but is fully recoverable is a minor error. The severity level of an error cannot be configured by a user.  
  
The other statements are explained separately.

**Required Privilege Level** **interface**—To view this statement in the configuration.  
**interface-control**—To add this statement to the configuration.

**Related Documentation**

- [Fabric Resiliency and Degradation on page 132](#)
- [show chassis fpc errors on page 1718](#)
- [Configuring FPC Error Levels and Actions on page 455](#)

## minimum-quality

**Syntax** minimum-quality;

**Hierarchy Level** [edit chassis [synchronization](#) output interfaces external]  
[edit chassis [synchronization](#) output interfaces (external-0/0 | external-1/0)]

**Release Information** Statement introduced in Junos OS Release 12.3 for MX Series routers.

**Description** Configure the minimum quality level threshold to select a clock source (see [Table 56 on page 271](#)). If the quality level of the output clock source drops below the configured minimum quality level threshold, the external output clock is suppressed on the external output interface—external—on SCBE and on the external output interfaces—external-0/0 and external-1/0—on SCBE2.

*Table 87: Quality Levels*

Quality Level	Description
prc	Timing quality of a primary reference clock (option-1 only).
prs	Clock traceable to a primary reference source (option-2 only).
sec	Timing quality of an SDH equipment clock (option-1 only).
smc	Clock traceable to a self-timed SONET (option-2 only).
ssu-a	Timing quality of a type I or IV slave clock (option-1 only).
ssu-b	Timing quality of a type VI slave clock (option-1 only).
st2	Clock traceable to Stratum 2 (option-2 only).
st3	Clock traceable to Stratum 3 (option-2 only).
st3e	Clock traceable to Stratum 3E (option-2 only).
st4	Clock traceable to Stratum 4 free-run (option-2 only).
stu	Clock traceable to an unknown quality (option-2 only).
tnc	Clock traceable to a transit node clock (option-2 only).

**Required Privilege Level** interface—To view this statement in the configuration.  
interface-control—To add this statement to the configuration.



Related Documentation • [synchronization on page 794](#)

## mlfr-uni-nni-bundles

Syntax	<code>mlfr-uni-nni-bundles <i>number</i>;</code>
Hierarchy Level	<code>[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i>]</code>
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure link services management properties.
Options	<p><b>number</b>—Number of Multilink Frame Relay user-to-network interface network-to-network interface (UNI-NNI) (FRF.16) bundles to allocate on a Link Services PIC.</p> <p><b>Range:</b> 1 through 255</p> <p><b>Default:</b> 16</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	• <a href="#">Configuring the Number of Bundles on Link Services PICs</a>

## mixed-rate-mode

Syntax	<code>mixed-rate-mode;</code>
Hierarchy Level	<code>[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> mixed-rate-mode],</code> <code>[edit chassis lcc <i>number</i> fpc <i>slot-number</i> pic <i>pic-number</i> mixed-rate-mode] (Routing Matrix)</code>
Release Information	Statement introduced in Junos OS Release 13.3.
Description	Configure the mixed-rate mode for the 24-port 10 Gigabit Ethernet PIC (PF-24XGE-SFPP) only.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> <li>• <a href="#">Modes of Operation of 10-Gigabit Ethernet PICs</a></li> <li>• <a href="#">Configuring Mixed-Rate Mode Operation on page 474</a></li> </ul>

## multicast-mode (PTP Master and Slave Interfaces)

**List of Syntax** [MX Series on page 712](#)  
[QFX Series on page 712](#)

**MX Series**

```
multicast-mode {
  asymmetry number;
  transport 802.3 link-local;
}
```

**QFX Series**

```
multicast-mode {
  local-ip-address local IP address;
  local-priority number;
}
transport {
  ieee-802.3;
  ipv4;
}
}
```

**Hierarchy Level** [edit protocols ptp [slave](#) interface *interface-name*],  
 [edit protocols ptp [master](#) interface *interface-name*]

**Release Information** Statement introduced in Junos OS Release 15.2 for MX Series routers.  
 Statement introduced in Junos OS Release 17.4 for the QFX Series.

**Description** Configure multicast transmission of Precision Time Protocol (PTP) packets between the master node and the slave node. The multicast method of transport of PTP packets is applicable in environments in which PTP uses IEEE 802.3 or Ethernet encapsulation for the transmission of PTP packets. Because PTP over Ethernet uses multicast addresses, a slave port can automatically start receiving the multicast announce messages transmitted by the master ports on a network and can also start communicating with the master port with minimal or no configuration. Unlike PTP over IPv4 where IP addresses are used to identify the master and slave ports, with PTP over Ethernet, multicast MAC addresses are used in forwarding of PTP traffic.

On the QFX Series, multicast-mode specifies that PTP should be forwarded with the multicast IPv4 packet format, and is required for the enterprise profile.



**NOTE:** You can configure only multicast mode or only unicast mode of transmission of PTP traffic on an interface at a point in time.



The remaining statements are explained separately. See [CLI Explorer](#).

<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring Precision Time Protocol on page 319</a></li><li>• <a href="#">Example: Configuring Precision Time Protocol on page 325</a></li><li>• <a href="#">Precision Time Protocol Overview on page 256</a></li></ul>

## multiservice

<b>Syntax</b>	<pre> multiservice {   source-mac;   destination-mac;   payload {     ip {       layer-3 (source-ip-only   destination-ip-only);       layer-4;     }   }   symmetric-hash {     complement;   } } </pre>
<b>Hierarchy Level</b>	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> hash-key family]
<b>Release Information</b>	Statement introduced in Junos OS Release 9.6.
<b>Description</b>	(MX Series 5G Universal Routing Platforms only) Configure data used in a hash key for the <b>multiservice</b> protocol family when configuring PIC-level symmetrical hashing for load balancing on an 802.3ad Link Aggregation Group.
<b>Options</b>	<p><b>destination-mac</b>—Include destination MAC address in the hash key.</p> <p><b>payload</b>—Include payload data in the hash key. This option has the following suboptions:</p> <ul style="list-style-type: none"> <li><b>layer-3</b>—Include Layer 3 IP information in the hash key.</li> <li><b>layer-4</b>—Include Layer 4 IP information in the hash key.</li> </ul> <p><b>source-mac</b>—Include source MAC address in the hash key.</p> <p><b>symmetric-hash</b>—Create a symmetric hash or symmetric hash complement key with any attribute.</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><a href="#">Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 489</a></li> </ul>

## network-option

<b>Syntax</b>	network-option (option-1   option-2);
<b>Hierarchy Level</b>	[edit chassis <a href="#">synchronization</a> ]
<b>Release Information</b>	Statement introduced in Junos OS Release 11.2R4 for MX Series routers.
<b>Description</b>	<p>Configure the Ethernet equipment clock (EEC) synchronization networking type.</p> <p> <b>NOTE:</b> For SCB, this option is set with the <code>set chassis synchronization network-type (option-1   option-2)</code> configuration command at the [edit] hierarchy level.</p> <p> <b>NOTE:</b> For Junos OS releases 11.2R4 through 13.3R3 for MX240, MX480, and MX960 with SCB, SCBE, and SCBE2; and MX2010 and MX2020 with SCB or SCBE; you must execute the following commands after you change the network option at the [edit chassis synchronization] hierarchy level. This is because the loop bandwidth does not change automatically when you change the network option.</p> <pre>user@host# deactivate chassis synchronization user@host# activate chassis synchronization</pre>
<b>Options</b>	<p>Depending on the configuration of the Synchronization Status Messages (SSM) quality level, the network option functions in the following ways:</p> <ul style="list-style-type: none"> <li><b>option-1</b>—Maps to the G.813 option 1 (EEC1).</li> <li><b>option-2</b>—Maps to the G.812 type IV clock (EEC1).</li> </ul>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><a href="#">synchronization on page 794</a></li> </ul>

## network-services

<b>Syntax</b>	<code>network-services (ethernet   enhanced-ethernet   ip   enhanced-ip   lan);</code>
<b>Hierarchy Level</b>	<code>[edit chassis]</code>
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 8.5.</p> <p><b>enhanced-ethernet</b> and <b>enhanced-ip</b> options introduced in Junos OS Release 11.4.</p> <p><b>limited-ifl-scaling</b> option introduced in Junos OS Release 15.1R3 for MX Series routers.</p>
<b>Description</b>	<p>Set the router's network services to a specific mode of operation. On MX240, MX480, and MX960 routers, MPC5E and MPC7E power on only if the network services mode configured is <b>enhanced-ip</b> or <b>enhanced-ethernet</b>.</p> <p>MX2010 and MX2020 support only <b>enhanced-ip</b> and <b>enhanced-ethernet</b> network services modes.</p>
<b>Default</b>	<ul style="list-style-type: none"> <li>MX80, MX104, MX2010, MX2020—<b>enhanced-ip</b></li> <li>MX240, MX480, MX960—<b>ip</b></li> </ul>
<b>Options</b>	<p><b>ethernet</b>—Set the router's network services to Ethernet and use standard, compiled firewall filter format.</p> <p><b>enhanced-ethernet</b>—Set the router's network services to enhanced Ethernet and use enhanced mode capabilities. Only MPCs and MS-DPCs are powered on in the chassis.</p> <p><b>ip</b>—Set the router's network services to Internet Protocol and use standard, compiled firewall filter format.</p> <p><b>enhanced-ip</b>—Set the router's network services to enhanced Internet Protocol and use enhanced mode capabilities. Only MPCs and MS-DPCs are powered on in the chassis. Non-service DPCs do not work with enhanced network services mode options. This feature is enabled by default on MX80, MX104, MX2010, and MX2020 Universal Routing Platforms.</p> <p><b>lan</b>—Set the router's network services to LAN and use standard, compiled firewall filter format. Reboot the system after setting the router's network services to LAN.</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><a href="#">Network Services Mode Overview on page 361</a></li> <li><i>Firewall Filters and Enhanced Network Services Mode Overview</i></li> </ul>


- [Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 366](#)
- [Configuring Enhanced IP Network Services for a Virtual Chassis](#)
- [Limiting the Maximum Number of Logical Interfaces on MX Series Routers With MS-DPCs in Enhanced IP Network Services Mode on page 368](#)

## no-concatenate

Syntax	no-concatenate;
Hierarchy Level	[edit chassis fpc slot-number pic pic-number], [edit chassis lcc number fpc slot-number pic pic-number] (Routing Matrix)
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>Do not concatenate (multiplex) the output of a SONET/SDH PIC (an interface with a name <i>so-fpc/pic/port</i>).</p> <p>When configuring and displaying information about interfaces that are operating in channelized mode, you must specify the channel number in the interface name (<i>physical:channel</i>); for example, <i>so-2/2/0:0</i> and <i>so-2/2/0:1</i>.</p> <p>On SONET OC48 interfaces that are configured for channelized (multiplexed) mode, the <b>bytes e1-quiet</b> and <b>bytes f1</b> options in the <b>sonet-options</b> statement have no effect. The <b>bytes f2</b>, <b>bytes z3</b>, <b>bytes z4</b>, and <b>path-trace</b> options work correctly on channel 0. They work in the transmit direction only on channels 1, 2, and 3.</p>
Default	Output is concatenated (multiplexed).
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> <li>• <a href="#">Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized (Multiplexed) Mode on page 467</a></li> </ul>

## no-multi-rate

---


Syntax	no-multi-rate;
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> ]
Release Information	Statement introduced in Junos OS Release 11.2.
Description	Disable the rate-selectability configuration.  <div> <b>NOTE:</b><ul style="list-style-type: none"><li>• The <b>no-multi-rate</b> statement is supported only on MIC-3D-8OC3OC12-4OC48.</li><li>• The <b>no-multi-rate</b> statement enables the first four ports [0 – 3] exclusively at OC48/STM16 speed.</li><li>• The <b>no-multi-rate</b> statement disables the last four ports [4 – 7].</li></ul></div>
Default	Rate-selectability is enabled, that is, by default the multirate mode is enabled.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"><li>• <a href="#">Configuring Port Speed on Multi-Rate MICs on page 475</a></li></ul>



## no-route-localize

<b>Syntax</b>	no-route-localize;
<b>Hierarchy Level</b>	[edit policy-options policy-statement <i>policy-name</i> term <i>term-name</i> then]
<b>Release Information</b>	Statement introduced in Junos OS Release 11.4.
<b>Description</b>	Enforce installation of routes on all FIB-remote Packet Forwarding Engines.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Example: Configuring Packet Forwarding Engine FIB Localization on page 383</a></li></ul>

## non-revertive (Chassis)

<b>Syntax</b>	non-revertive;
<b>Hierarchy Level</b>	[edit chassis aggregated-devices ethernet lacp link-protection]
<b>Release Information</b>	Statement introduced in Junos OS Release 9.3. Statement introduced in Junos OS Release 11.4 for EX Series switches.
<b>Description</b>	<p>Disable the ability to switch to a better priority link (if one is available) once a link is established as active and a collection or distribution is enabled.</p> <hr/> <div>  <p><b>BEST PRACTICE:</b> (MX Series) By default, Link Aggregation Control Protocol link protection is revertive. This means that after the current link becomes active, the router switches to a higher-priority link if one becomes operational or is added to the aggregated Ethernet bundle. In a highly scaled configuration over aggregated Ethernet, we recommend that you prevent the router from performing such a switch by including the <b>non-revertive</b> statement. Failure to do so may result in some traffic loss if a MIC on which a member interface is located reboots. Using the <b>non-revertive</b> statement for this purpose is not effective if both the primary and secondary interfaces are on the MIC that reboots.</p> </div> <hr/>
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring Junos OS for Supporting Aggregated Devices on page 481</a></li> <li>• <a href="#">Configuring LACP Link Protection of Aggregated Ethernet Interfaces for Switches</a></li> </ul>

## number-of-ports

<b>Syntax</b>	<code>number-of-ports <i>number-of-active-physical-ports</i>;</code>
<b>Hierarchy Level</b>	<code>[edit chassis fpc <i>slot-number</i>]</code> <code>[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i>]</code>
<b>Hierarchy Level</b>	<code>[edit chassis fpc <i>fpc-slot</i> pic <i>pic-number</i> pic-mode <i>pic-speed</i>]</code>
<b>Release Information</b>	<p>Statement introduced in Junos OS Release 10.1 for the 16x10GE MPC.</p> <p>Support for MPC3, MPC4, MPC5, and MPC6 introduced in Junos OS Release 13.3R2.</p> <p>Support for MPC7E-MRATE MPC introduced in Junos OS Release 15.1F4.</p> <p>Support for MPC8E and MPC9E introduced in Junos OS Release 15.1F5.</p> <p>Support for MX10003 MPC introduced in Junos OS Release 17.3R1</p> <p>Support for MX204 routers introduced in Junos OS Release 17.4R1</p> <p>Statement introduced in Junos OS Release 16.1 for EX9200 switches.</p>
<b>Description</b>	<p>Administratively enable physical ports, for example, to prevent oversubscription of the line card fabric interface. By default, all available ports are enabled. When disabled, the LED on the affected line card will appear yellow on capable line cards.</p> <p>(MX Series with 16x10GE MPC, MPC3, MPC4, MPC5, and MPC6) You can disable a subset of the physical ports available on the Packet Forwarding Engines of the 16x10GE MPC, and for MICs installed in MPC3, MPC4, MPC5, and MPC6. Specify either 8 or 12 ports by using this statement. When eight active ports are configured, two ports per Packet Forwarding Engine are disabled, and the LEDs on the MPC appear <b>yellow</b>. When you specify 12 active ports, one port per Packet Forwarding Engine is disabled and the corresponding LED appear <b>yellow</b>. When you do not include this statement in the configuration, all 16 default ports on the MPC are active.</p> <p>(MX Series with MPC7E-MRATE, MPC8E, and MPC9E) To ensure guaranteed bandwidth by preventing fabric oversubscription, you can disable a subset of the physical ports available on MPC7E-MRATE, MPC8E, and MPC9E. For information about the active ports for MPC7E-MRATE, MPC8E, and MPC9E, see <a href="#">“Supported Active Physical Ports for Configuring Rate Selectability to Prevent Oversubscription” on page 189</a>.</p> <p>(MX204 routers) To ensure guaranteed bandwidth by preventing oversubscription, you can disable a subset of the physical ports available on MX204 routers. For information about the active ports for MX204 routers, see <a href="#">“Supported Active Physical Rate-Selectable Ports to Prevent Oversubscription on MX204 Router” on page 193</a></p> <p>(EX9200 switches)</p>
<b>Options</b>	<code><i>number-of-active-physical-ports</i></code> —Specify the number of physical ports to enable on PICs or MICs on an MPC.

<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring the Number of Active Ports on 16-Port MPCs of MX Series Routers on page 61</a></li><li>• <a href="#">Supported Active Physical Ports for Configuring Rate Selectability to Prevent Oversubscription on page 189</a></li><li>• <a href="#">Configuring Rate Selectability on MPC7E (Multi-Rate) to Enable Different Port Speeds on page 201</a></li><li>• <a href="#">Configuring Rate Selectability on MIC-MRATE to Enable Different Port Speeds on page 196</a></li><li>• <a href="#">Configuring Rate Selectability on MX204 to Enable Different Port Speeds on page 220</a></li><li>• <a href="#">Understanding Rate Selectability on page 176</a></li></ul>

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## offline

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<b>Syntax</b>	offline;
<b>Hierarchy Level</b>	[edit chassis <i>lcc number</i> ]
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4.
<b>Description</b>	(Routing matrix based on the TX Matrix and TX Matrix Plus routers only) On a TX Matrix router, configure a T640 router so that it is not part of the routing matrix. On a TX Matrix Plus router, configure a T1600 or T4000 router so that it is not part of the routing matrix.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">online-expected on page 725</a></li><li>• <a href="#">TX Matrix Router and T640 Router Configuration Overview on page 373</a></li><li>• <a href="#">TX Matrix Plus Router Configuration Overview on page 397</a></li><li>• <a href="#">Configuring Junos OS to Enable the TX Matrix Router to Generate an Alarm If a T640 Router Stays Offline on page 380</a></li><li>• <a href="#">Configuring Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 or T4000 Router Stays Offline on page 406</a></li></ul>



## offline-on-fabric-bandwidth-reduction

<b>Syntax</b>	<code>offline-on-fabric-bandwidth-reduction;</code>
<b>Hierarchy Level</b>	<code>[edit chassis fpc slot-number]</code>
<b>Release Information</b>	Statement introduced in Junos OS Release 11.4.
<b>Description</b>	Configure an FPC with degraded fabric bandwidth offline, to avoid causing a traffic black hole in the chassis for an extended time.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Disabling an FPC with Degraded Fabric Bandwidth on page 144</a></li> <li>• <a href="#">Managing Bandwidth Degradation on page 143</a></li> </ul>

## on-disk-failure (Chassis Routing Engine)

<b>Syntax</b>	<pre>on-disk-failure {   disk-failure-action (halt   reboot); }</pre>
<b>Hierarchy Level</b>	<code>[edit chassis routing-engine]</code>
<b>Release Information</b>	Statement introduced before JUNOS Release 7.4. The <code>disk-failure-action</code> statement added in JUNOS Release 9.0.
<b>Description</b>	Instruct the router to halt or reboot if it detects hard disk errors on the Routing Engine.
<b>Options</b>	The remaining statement is explained separately. See <a href="#">CLI Explorer</a> .
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring the Junos OS to Enable a Routing Engine to Reboot on Hard Disk Errors on page 509</a></li> </ul>

## on-error

<b>Syntax</b>	<pre>on-error {   raise-alarm;   power (cycle   off);   write-coredump; }</pre>
<b>Hierarchy Level</b>	<pre>[edit chassis cfep slot-number] [edit chassis feb slot-number] [edit chassis fpc slot-number sanity-poll] [edit chassis lcc number fpc number sanity-poll] (Routing Matrix)</pre>
<b>Release Information</b>	<p>Statement introduced in Junos OS Release 11.4.</p> <p>Statement introduced in Junos OS Release 15.1 on M7i, M10, M120, and M320 routers.</p>
<b>Description</b>	Instruct the FPC or FEB or CFEB to perform actions during an error condition.
<b>Options</b>	<p><b>raise-alarm</b>—Generate and display a chassis alarm in case of an error.</p> <p><b>power cycle</b>—Reboot the FPC or FEB or CFEB after generating a core file. This statement is useful in case of temporary software errors that are eliminated after reboot.</p> <p><b>power off</b>—Halt the FPC or FEB or CFEB and keep it offline. This statement is useful in case of permanent hardware failures.</p>
	<div>  <p><b>CAUTION:</b> The <b>power off</b> statement halts the FPC or FEB or CFEB. Ensure that you have backup paths through different FPC or FEB or CFEB to avoid service outage.</p> </div>
	<div>  <p><b>NOTE:</b> The <b>power cycle</b> and <b>power off</b> statements are mutually exclusive: You can configure either the <b>power cycle</b> or the <b>power off</b> statement for an error.</p> </div>
	<p><b>write-coredump</b>—Trigger the core file in case of an error.</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring Sanity Polling on page 511</a></li> <li>• <a href="#">sanity-poll on page 770</a></li> </ul>

- [retry-count on page 765](#)

## online-expected

<b>Syntax</b>	online-expected;
<b>Hierarchy Level</b>	[edit chassis <i>lcc number</i> ]
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4.
<b>Description</b>	(TX Matrix and TX Matrix Plus routing matrix only) On a TX Matrix router, configure a T640 router so that if it does not come online, an alarm is sent to the TX Matrix router. On a TX Matrix Plus router, configure a T1600 or a T4000 router so that if it does not come online, an alarm is sent to the TX Matrix Plus router.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">TX Matrix Router and T640 Router Configuration Overview on page 373</a></li> <li>• <a href="#">TX Matrix Plus Router Configuration Overview on page 397</a></li> <li>• <a href="#">Configuring Junos OS to Enable the TX Matrix Router to Generate an Alarm If a T640 Router Stays Offline on page 380</a></li> <li>• <a href="#">Configuring Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 or T4000 Router Stays Offline on page 406</a></li> <li>• <a href="#">offline on page 722</a></li> </ul>

## oss-map

Syntax	<pre>oss-map {   model-name t640 t1600; }</pre>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 12.3R3, 13.1R2, and 13.2R1 for T4000 routers.
Description	Configure the operations support systems (OSS) mapping feature to map a T4000 chassis to a T1600 chassis or a T640 chassis, so that the T4000 chassis is represented as a T1600 chassis or a T640 chassis, respectively. The configuration helps prevent requalifying the T1600 chassis and T640 chassis as a new chassis on the OSS.
Options	<p><b>model-name t640</b>—Perform OSS mapping on a T4000 chassis to represent it as a T640 chassis, thereby overriding the chassis model name as displayed in the output of the <b>show chassis hardware</b>, the <b>show snmp mib walk system</b>, and the <b>show snmp mib walk jnxBoxAnatomy</b> operational commands.</p> <p><b>model-name t1600</b>—Perform OSS mapping on a T4000 chassis to represent it as a T1600 chassis, thereby overriding the chassis model name as displayed in the output of the <b>show chassis hardware</b>, the <b>show snmp mib walk system</b>, and the <b>show snmp mib walk jnxBoxAnatomy</b> operational commands.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> <li><a href="#">Configuring OSS Mapping to Represent a T4000 Chassis as a T1600 or a T640 Chassis on page 447</a></li> <li><a href="#">Example: Configuring a T4000 Chassis to Represent a T640 Chassis on page 449</a></li> <li><a href="#">show chassis oss-map on page 2018</a></li> </ul>




## output interfaces external

<b>Syntax</b>	<pre> output {   interfaces {     external {       holdover-mode-disable;       minimum-quality (prc   prs   sec   smc   ssu-a   ssu-b   st2   st3   st3e   st4   stu   tnc);       source-mode (chassis   line); tx-dnu-to-line-source-enable;       tx-dnu-to-line-source-enable;       wander-filter-disable;     }   } } </pre>
<b>Hierarchy Level</b>	[edit chassis <a href="#">synchronization</a> ]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.3 for MX Series routers.
<b>Description</b>	<p>Configure the options for the external clock output interface—external—on SCBE.</p> <p>Configure the options for the external clock output interfaces—external-0/0 and external-1/0—on SCBE2.</p>
<b>Options</b>	The remaining statements are explained separately. See <a href="#">CLI Explorer</a> .
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><a href="#">synchronization on page 794</a></li> </ul>

## packet-scheduling

---

<b>Syntax</b>	(packet-scheduling   no-packet-scheduling);
<b>Hierarchy Level</b>	[edit chassis]
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4.
<b>Description</b>	(M 160 routers only) Enable packet-scheduling mode, in which the Packet Director application-specific integrated circuit (ASIC) schedules packet dispatches to compensate for transport delay differences. This preserves the interpacket gaps as the packets are distributed from the Packet Director ASIC to the Packet Forwarding Engine.
<b>Default</b>	no-packet-scheduling
	<div> <b>NOTE:</b> The packet-scheduling feature is available on M160 routers only.</div>
<b>Options</b>	<p><b>no-packet-scheduling</b>—Do not schedule packets.</p> <p><b>packet-scheduling</b>—Schedule packets to preserve interpacket gaps.</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring the Junos OS to Enable an M160 Router to Operate in Packet Scheduling Mode on page 431</a></li></ul>

## payload

<b>Syntax</b>	<pre>payload {   ip {     layer-3;     layer-4;   } }</pre>
<b>Hierarchy Level</b>	[edit chassis fpc slot-number pic pic-number hash-key family multiservice]
<b>Release Information</b>	Statement introduced in Junos OS Release 9.6.
<b>Description</b>	(MX Series 5G Universal Routing Platforms only) Include payload data in a hash key for the <b>multiservice</b> protocol family when configuring PIC-level symmetrical load balancing on an 802.3ad Link Aggregation Group.
<b>Options</b>	<p><b>ip</b>—Include IPv4 payload data in the hash key. This option has the following suboptions:</p> <ul style="list-style-type: none"> <li>• <b>layer-3</b>—Include Layer 3 IP information in the hash key.</li> <li>• <b>layer-4</b>—Include Layer 4 IP information in the hash key.</li> </ul>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 489</a></li> </ul>

## pem (M320 Routers)



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<b>Syntax</b>	<pre>pem {   minimum <i>number</i>; }</pre>
<b>Hierarchy Level</b>	[edit chassis]
<b>Release Information</b>	Statement introduced in Junos OS Release 7.4.
<b>Description</b>	Configure the minimum number of Power Entry Modules (PEMs) on an M320 router. With this configuration, PEM absent alarms are generated only if the PEM count falls below the minimum specified.
<b>Options</b>	<b>minimum <i>number</i></b> —Minimum number of PEMs on the router. <b>Range:</b> 0 through 3
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring the Junos OS to Support Entry-Level Configuration on an M320 Router with a Minimum Number of SIBs and PIMs on page 435</a></li><li>• <a href="#">sib on page 776</a></li></ul>

## pem (T640, T1600, and T4000 Routers with Six-Input DC Power Supply)

Syntax	<pre>pem {   feeds <i>number-of-input-feeds</i>;   input-current <i>amps-in-each-feed</i>; }</pre>
Hierarchy Level	[edit chassis] [edit chassis lcc <i>lcc-number</i> ] (Routing Matrix)
Release Information	Statement introduced in Junos OS Release 12.1. Option <b>feeds</b> introduced in Junos OS Release 12.1. Option <b>input-current</b> introduced for T4000 routers in Junos OS Release 12.3.
Description	Configure the power supply parameters of the six-input DC power supply on T640, T1600, or T4000 routers.
Options	<b>feeds</b> <i>number-of-input-feeds</i> —Number of input feeds connected to the six-input DC power supply.  (For T4000 routers only) <b>input-current</b> <i>amps-in-each-feed</i> —Input current (in amperes) in each feed.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> <li>• <a href="#">Configuring the Six-Input DC Power Supply on T Series Routers on page 110</a></li> </ul>

## performance-mode

Syntax	<pre>performance-mode {   number-of-ucode-workers <i>number-of-ucode-workers</i>; }</pre>
Hierarchy Level	[edit chassis fpc 0]
Release Information	<p>Statement introduced in Junos OS Release 15.1F4 and 16.1R1 for vMX routers.</p> <p><b>number-of-ucode-workers</b> option introduced in Junos OS Release 15.1F6 and 16.2R1 for vMX routers.</p>
Description	<p>(vMX routers only) Enables vMX to run in performance mode. Performance mode needs more vCPUs and memory to run at higher bandwidth.</p> <p>.....</p> <p> <b>NOTE:</b> When you enable performance mode, make sure you have configured the proper number of vCPUs and memory for your VMs based on your use case. If you have not configured enough vCPUs, vMX runs in lite mode.</p> <p>.....</p> <p>Starting with Junos OS Release 15.1F6, performance mode is enabled by default for vMX.</p> <p>.....</p> <p> <b>NOTE:</b> The FPC reboots if you change this configuration.</p> <p>.....</p> <p>You can tune performance mode for unicast traffic by changing the number of Workers dedicated to processing multicast and control traffic. Starting with Junos OS Release 17.2R1, you do not need to specify dedicated Workers for processing multicast traffic. The default specifies that all available Workers are used to process all traffic.</p> <p>The number of dedicated Workers specified in relation to the number of available Workers results in the following behavior:</p> <ul style="list-style-type: none"> <li>• If the number of dedicated Workers is greater than or equal to the number of available Workers, then all available Workers are used to process all traffic.</li> <li>• If the number of dedicated Workers is less than the number of available Workers, then the first set of available Workers (equal to the specified number of dedicated Workers) is used to process multicast and control traffic while the remaining available Workers are used to process flow cache traffic.</li> </ul> <p>Options    <b>performance-mode</b>—Enables performance mode.</p>

To disable performance mode, enable lite mode by including the **lite-mode** statement at the **[edit chassis fpc 0]** hierarchy level.

**number-of-ucode-workers** *number-workers*—Specifies the number of dedicated Workers for processing multicast and control traffic.

**Range:** 0 through 15

**Default:** 0 specifies that all available Workers are used to process all traffic.

**Required Privilege Level** **interface**—To view this statement in the configuration.  
**interface-control**—To add this statement to the configuration.

**Related Documentation**

- [lite-mode on page 694](#)

## phy-timestamping

**Syntax** phy-timestamping

**Hierarchy Level** [edit protocols ptp]

**Release Information** Statement introduced in Junos OS Release 17.1R1.

**Description** Configure timestamping of the IEEE 1588 event packets at the physical layer. Timestamping the packet at the physical layer, also known as PHY timestamping, eliminates the noise or the packet delay variation (PDV) that is introduced by the Packet Forwarding Engine.

By default PHY timestamping is disabled.

**Required Privilege Level** **routing**—To view this statement in the configuration.  
**routing-control**—To add this statement to the configuration.

**Related Documentation**

- [Precision Time Protocol Overview on page 256](#)

## pic (M Series and T Series Routers)

```
Syntax pic pic-number {
    cel {
        el port-number {
            channel-group group-number timeslots slot-number;
        }
    }
    ct3 {
        port port-number {
            tl link-number {
                channel-group group-number timeslots slot-number;
            }
        }
    }
    framing (sdh | sonet);
    idle-cell format {
        itu-t;
        payload-pattern payload-pattern-byte;
    }
    inline-services {
        bandwidth (1g | 10g);
    }
    max-queues-per-interface (8 | 4);
    no-concatenate;
}
```

**Hierarchy Level** [edit chassis fpc *slot-number*]

**Release Information** Statement introduced before Junos OS Release 7.4.

**Description** Configure properties for an individual PIC.

**Options** *pic-number*—Slot number in which the PIC is installed.

**Range:** 0 through 3

The remaining statements are explained separately. Search for a statement in [CLI Explorer](#) or click a linked statement in the Syntax section for details.

**Required Privilege Level** interface—To view this statement in the configuration.  
interface-control—To add this statement to the configuration.

**Related Documentation**

- [Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 461](#)
- [Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized \(Multiplexed\) Mode on page 467](#)



- [Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 495](#)
- [Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 468](#)

## pic (MX Series Routers)

```

Syntax  pic pic-number {
        account-layer2-overhead;
        adaptive-services {
            (layer-2 | layer-3);
        }
        aggregate-ports;
        cel {
            el port-number {
                channel-group group-number timeslots slot-number;
            }
        }
        channelization;
        ct3 {
            port port-number {
                tl link-number {
                    channel-group group-number timeslots slot-number;
                }
            }
        }
        egress-policer-overhead bytes;
        framing (sdh | sonet);
        idle-cell format {
            itu-t;
            payload-pattern payload-pattern-byte;
        }
        ingress-policer-overhead bytes;
        inline-services {
            bandwidth (1g | 10g);
        }
        max-queues-per-interface (8 | 4);
        mlfr-uni-nni-bundles number;
        mlfr-uni-nni-bundles-inline number;
        multi-link-layer-2-inline;
        no-concatenate;
        no-multi-rate;
        pic-type OID of PIC type;
        sparse-dlcis;
        tunnel-services (Chassis) {
            bandwidth (1g | 10g | 20g | 40g);
            tunnel-only;
        }
        vtmapping (klm | itu-t);
    }

```

Hierarchy Level [edit chassis fpc *slot-number*]

**Release Information** Statement introduced before Junos OS Release 7.4.  
**multi-link-layer-2-inline** and **mlfr-uni-nni-bundles-inline** options introduced in Junos OS Release 14.1.

<b>Description</b>	Configure properties for an individual PIC.
<b>Options</b>	<i>pic-number</i> —Slot number in which the PIC is installed. <b>Range:</b> 0 through 3  The remaining statements are explained separately.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 461</a></li><li>• <a href="#">Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized (Multiplexed) Mode on page 467</a></li><li>• <a href="#">Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 495</a></li><li>• <a href="#">Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 468</a></li><li>• <i>Enabling Inline Service Interfaces</i></li></ul>

## pic (TX Matrix and TX Matrix Plus Routers)

<b>Syntax</b>	<pre> pic <i>pic-number</i> {   aggregate-ports;   atm-cell-relay-accumulation;   atm-l2circuit-mode (cell   aal5   trunk <i>trunk</i>);   egress-policer-overhead (<i>count</i>);   framing (sdh   sonet);   idle-cell-format {     itu-t;     payload-pattern <i>payload-pattern-byte</i>;   }   ingress-policer-overhead (<i>count</i>);   max-queues-per-interface (8   4);   no-concatenate;   no-mcast-replication;   q-pic-large-buffer (large-scale   small-scale); } </pre>
<b>Hierarchy Level</b>	[edit chassis lcc <i>number</i> fpc <i>slot-number</i> ]
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4.
<b>Description</b>	On a TX Matrix or TX Matrix Plus router, configure properties for an individual PIC.
<b>Options</b>	<p><b><i>pic-number</i></b>—Slot number in which the PIC is installed.</p> <p><b>Range:</b> 0 through 3</p> <p>The remaining statements are explained separately.</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">TX Matrix Router and T640 Router Configuration Overview on page 373</a></li> <li>• <a href="#">TX Matrix Plus Router Configuration Overview on page 397</a></li> <li>• <a href="#">Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 461</a></li> </ul>

## pic-mode

<b>Syntax</b>	<code>pic-mode <i>pic-speed</i>;</code>
<b>Hierarchy Level</b>	<code>[edit chassis (EX Series) fpc slot pic <i>pic-number</i> ]</code>
<b>Release Information</b>	<p>Statement introduced in Junos OS Release 15.1F4 for MX Series routers with the MPC7E-MRATE MPC.</p> <p>Statement introduced in Junos OS Release 15.1F5 for MX Series routers with the MIC-MRATE MIC.</p> <p>Statement introduced in Junos OS Release 17.3R1 for MX10003 routers with the MX10003 MPC.</p> <p>Statement introduced in Junos OS Release 17.4R1 for MX204 Universal Routing Platforms.</p>
<b>Description</b>	<p>Configure the operating speed of all ports on the MPC7E-MRATE MPC, MIC-MRATE MIC, MX10003 MPC, and MX204 routers.</p> <p>(MX240, MX480, MX960, MX2010, and MX2020 routers with MPC7E-MRATE) To configure 100 Gbps, 10 Gbps, and 40 Gbps speed on all supported ports, specify <b>100G</b>, <b>10G</b>, or <b>40G</b>, respectively, as the speed for the specified PIC. All the six ports of PIC 0 and PIC 1 of an MPC7E-MRATE MPC support 10-Gbps and 40-Gbps speeds. However, only ports 2 and 5 of PIC 0 and PIC 1 support 100-Gbps speed. Therefore, if you configure <b>100G</b> as the operating speed of a PIC, the PIC is rebooted and the ports 0, 1, 3, and 4 are disabled.</p> <p>(MX2010 and MX2020 routers with MIC-MRATE on MPC8E and MPC9E) To configure the port speed at MIC level or on all supported ports, specify <b>100G</b>, <b>10G</b>, or <b>40G</b>, respectively, as the speed for the MIC-MRATE MIC on MPC8E and MPC9E. All the twelve ports of MIC-MRATE MIC support 10 Gbps and 40 Gbps speeds. When you configure the port speed as 100 Gbps at the PIC level for MPC8E, you can configure only 4 ports of the 12 MIC-MRATE ports on MPC8E to operate at 100 Gbps port speed. The other ports are disabled. Therefore, if you configure <b>100G</b> as the operating speed for ports 0, 1, 6, and 7, the other ports are disabled on MPC8E. Similarly, when you configure the port speed as 100 Gbps at the PIC level you can configure only 8 ports of the 12 MIC-MRATE ports on MPC9E with 100 Gbps port speed. Therefore, if you configure <b>100G</b> as the operating speed for ports 0, 1, 2, 3, 6, 7, 8, and 9, the other ports can support only 40 Gbps or 10 Gbps. However, enabling port speed of 40 Gbps or 10 Gbps at the PIC level, enables all ports and sets the desired port speed on all ports.</p> <p>(MX10003 routers with MX10003 MPC) To configure 100 Gbps, 10 Gbps, and 40 Gbps speed on all supported ports, specify 100G, 10G, or 40G, respectively, as the speed for the specified PIC. All the six ports of the fixed port PIC support 10-Gbps and 40-Gbps speeds. All the 12 ports of the Multi-rate MIC support 100-Gbps, 10-Gbps and 40-Gbps speeds. To configure all ports to operate at the same speed, configure rate selectability at the PIC level, in which case you cannot configure the speed of individual ports. To configure rate selectability at the PIC level, use the <b>pic-mode</b> statement and specify the port speed. For more information see <a href="#">“MX10003 MPC on MX10003 Router Overview”</a> on</p>

[page 43](#) and [“Supported Active Physical Ports for Configuring Rate Selectability to Prevent Oversubscription on MX10003 MPC” on page 192.](#)

(MX204 routers) To configure all ports to operate at the same speed, configure rate selectability at the PIC level, in which case you cannot configure the speed of individual ports. To configure rate selectability at the PIC level, use the **pic-mode** statement and specify the port speed. The MX204 has four rate-selectable ports (referred to a PIC 0 ports) that can be configured as 100-Gigabit Ethernet ports or 40-Gigabit Ethernet port, or each port can be configured as four 10-Gigabit Ethernet ports (by using a breakout cable). The MX204 also has eight 10-Gigabit Ethernet ports (referred to as PIC 1 ports).

The MX204 router does not support heterogeneous mode. That is, in PIC mode if 40-Gbps or 100-Gbps speed is configured on PIC 0, then the **number-of-ports** on PIC 1 must be configured to 0 only. For more information, see [“MX204 Router Overview” on page 45](#) and [“Supported Active Physical Rate-Selectable Ports to Prevent Oversubscription on MX204 Router” on page 193.](#)

**Options**    *pic-speed*—Operating speed of the interfaces configured on the ports of an MPC7E-MRATE MPC.

**100G**—Supported ports operate at 100 Gbps speed.

**10G**—Supported ports operate at 10 Gbps speed.

**40G**—Supported ports operate at 40 Gbps speed.

**Default:** 10G

**Required Privilege Level**    interface—To view this statement in the configuration.  
   interface-control—To add this statement to the configuration.

**Related Documentation**

- [Configuring Rate Selectability on MPC7E \(Multi-Rate\) to Enable Different Port Speeds on page 201](#)
- [Configuring Rate Selectability on MIC-MRATE to Enable Different Port Speeds on page 196](#)
- [Configuring Rate Selectability on MX10003 MPC to Enable Different Port Speeds on page 216](#)
- [Configuring Rate Selectability on MX204 to Enable Different Port Speeds on page 220](#)
- [Understanding Rate Selectability on page 176](#)

## policer-drop-probability-low

<b>Syntax</b>	policer-drop-probability-low;
<b>Hierarchy Level</b>	[edit chassis]
<b>Release Information</b>	Statement introduced in Junos OS Release 11.4R1.
<b>Description</b>	<p>Reduces the possibility that policers configured on the router might drop packets. For some Juniper Networks routers, policers can mark packets as out-of-specification in accordance with TCP. By default, these policers begin to randomly drop packets when the current credit exceeds the credit limit. In the context of TCP, this random drop mechanism helps to smooth the flow of traffic. The <b>policer-drop-probability-low</b> statement causes the policers to operate as strict rate limiters and to ignore the standard TCP behavior.</p> <p>The <b>policer-drop-probability-low</b> statement is applicable to the following routing platforms:</p> <ul style="list-style-type: none"> <li>• M7i</li> <li>• M10i</li> <li>• M120</li> <li>• M320</li> <li>• MX Series</li> </ul>
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">show pfe cfeb on page 2224</a></li> <li>• <a href="#">show pfe feb on page 2228</a></li> <li>• <a href="#">show pfe fpc on page 2234</a></li> </ul>

## port (Chassis)


Syntax	<code>port <i>port-number</i>;</code>
Hierarchy Level	<code>[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> ct3]</code>
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure the channelized T3 port number on the PIC.
Options	<i>port-number</i> —Port number. Range: 0 through 1
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> <li><a href="#">Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 495</a></li> </ul>

## port auxiliary time-of-day-format



Syntax	<code>port auxiliary time-of-day-format ascii <i>string</i>;</code>
Hierarchy Level	<code>[edit chassis synchronization source interfaces (external-a   external-b   interface <i>interface-name</i>)]</code> <code>[edit chassis synchronization source interfaces (external   interface <i>interface-name</i>)]</code> <code>[edit chassis synchronization source interfaces (external-0/0   external-1/0   interface <i>interface-name</i>)]</code>
Release Information	Statement introduced in Junos OS Release 13.3 for MX Series routers.
Description	Configure the time-of-day message format as ASCII on the auxiliary port that receives the external clock signals.
Options	<i>string</i> —Set the message format in ASCII characters.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> <li><a href="#">synchronization (MX Series) on page 794</a></li> </ul>



## speed

Syntax	speed [10G   40G   100G];
Hierarchy Level	[edit chassis fpc slot-number pic pic-number port port-number]
Release Information	Statement introduced in Junos OS Release 15.1F3 and 16.1R2 for PTX5000 routers. Statement introduced in Junos OS Release 15.1F6 and 16.1R2 for PTX3000 routers. Statement introduced in Junos OS Release 16.1X65 for PTX1000 routers.
Description	Configure the port speed on interface modules that support multiple port speeds. To check the port speed, use the <b>show interfaces</b> command. To determine whether a PIC has specific port speed configuration requirements, see the PIC's description in <i>PTX Series Interface Module Reference</i> .
Options	10G—10 Gbps  40G—40 Gbps  100G—100 Gbps
<div>  <p><b>NOTE:</b> For PTX 1000 routers, the default port speed is 10 Gbps.</p> </div>	
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> <li>• <i>Modes of Operation of 10-Gigabit Ethernet PICs</i></li> <li>• <a href="#">Configuring Mixed-Rate Mode Operation on page 474</a></li> <li>• <a href="#">mixed-rate-mode on page 711</a></li> </ul>

## power

Syntax	<code>power (off   on);</code>
Hierarchy Level	<pre>[edit chassis fpc slot-number] [edit chassis fpc name pic], [edit chassis lcc name fpc name pic name], [edit chassis member name fpc name pic]</pre>
Release Information	<p>The <code>edit chassis fpc slot-number</code> statement introduced before Junos OS Release 7.4.</p> <p>The <code>edit chassis fpc slot-number pic pic-number power off</code> introduced in Junos OS Release 13.3R2.</p> <p>Statement introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.</p>
Description	<p>The <code>edit chassis fpc slot-number</code> command configures the Flexible PIC Concentrator (FPC) to stay offline or to come online automatically.</p> <p>.....</p> <div>  <p><b>NOTE:</b> In a node slicing context, issuing the command <code>set chassis fpc slot-number power off</code> on the BSYS (base system) powers off even those FPCs that are assigned to the Guest Network Functions (GNFs) in which unified in-service software upgrade (ISSU) is in progress. Learn more about <a href="#">Junos Node Slicing</a>.</p> </div> <p>.....</p> <p>The <code>edit chassis fpc slot-number pic pic-number power off</code> command turns off the power to the PIC in the specified FPC.</p> <p>.....</p> <div>  <p><b>NOTE:</b> <code>power off</code> command is applicable only to the fixed-configuration MPC with six 40-Gigabit Ethernet ports and twenty-four 10-Gigabit Ethernet ports (MPC5E-40G10G). For other PICs, it is ignored with a syslog message.</p> </div> <p>.....</p>
Default	on
Options	<p><b>off</b>—Take the FPC offline, and configure it to stay offline, as, for example, after a system reboot.</p> <p><b>on</b>—Bring the FPC online, and configure it to come online automatically, as, for example, after a system reboot.</p> <p><b>off</b>—Take the PIC in the specified FPC offline, and configure it to stay offline, as, for example, after a system reboot.</p>


**on**—Bring the PIC in the specified FPC online, and configure it to come online automatically, as, for example, after a system reboot.

**Required Privilege** interface—To view this statement in the configuration.  
**Level** interface-control—To add this statement to the configuration.

**Related Documentation** • [Configuring the Junos OS to Make a Flexible PIC Concentrator Stay Offline on page 459](#)

## preserve-fpc-poweron-sequence

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Syntax	preserve-fpc-poweron-sequence;
Hierarchy Level	[edit chassis]
Release Information	<p>Statement introduced in Junos OS Release 15.1 for MX Series routers.</p> <p>Statement introduced in Junos OS Release 17.2R1 for EX9200 switches.</p> <p>Statement introduced in Junos OS Release 18.2R1 for MX10008 Universal Routing Platforms.</p>
Description	<p>Preserve the sequence in which the line cards—specifically, MPCs on MX series routers—on a router or switch are powered on when the device is restarted. During a system reboot, the line cards are brought online in the sequence specified in the system log file <code>/var/log/fpc_poweron_seq.log</code>. When a line card goes offline, its entry is removed from the log file. You can use the <a href="#">show chassis power sequence</a> command to view the configured power-on sequence.</p>
<div> NOTE:</div> <ul style="list-style-type: none"><li>• If both <code>preserve-fpc-poweron-sequence</code> and <code>fru-poweron-sequence</code> statements are configured, then the power-on sequence specified in the <code>fru-poweron-sequence</code> statement takes precedence.</li><li>• If <code>preserve-fpc-poweron-sequence</code> is configured and <code>fru-poweron-sequence</code> not configured, then the line cards are powered on in the sequence preserved in the system log file <code>/var/log/fpc_poweron_seq.log</code>.</li><li>• If neither of these statements is configured, then the line cards are powered on in the ascending order of their slot numbers. Line cards whose slot numbers are not specified in the log file are powered on in the ascending order of their slot numbers.</li></ul>	
Required Privilege Level	<p>chassis—To view this statement in the configuration.</p> <p>chassis-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"><li>• <a href="#">fru-poweron-sequence on page 669</a></li><li>• <a href="#">show chassis power sequence on page 2076</a></li><li>• <a href="#">Understanding How Dynamic Power Management Enables Better Utilization of Power on page 103</a></li></ul>

## primary

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<b>Syntax</b>	<code>primary interface name;</code>
<b>Hierarchy Level</b>	[edit protocols ptp <a href="#">slave</a> interface <i>interface-name</i> ], [edit protocols ptp <a href="#">master</a> interface <i>interface-name</i> ]
<b>Release Information</b>	Statement introduced in Junos OS Release 17.2R1.
<b>Description</b>	Configure the primary member link in an aggregated Ethernet bundle to enable Precision Time Protocol (PTP) over a link aggregation group. PTP master streams are created on the FPC on which the primary interface is present. Announce and sync packets are transmitted on this primary PTP Aggregated Ethernet link.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring Precision Time Protocol on page 319</a></li><li>• <a href="#">Example: Configuring Precision Time Protocol on page 325</a></li><li>• <a href="#">Precision Time Protocol Overview on page 256</a></li></ul>

## priority1

<b>Syntax</b>	<code>priority1 <i>priority1-value</i>;</code>
<b>Hierarchy Level</b>	<code>[edit protocols ptp]</code>
<b>Release Information</b>	<p>Statement introduced in Junos OS Release 12.2.</p> <p>Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Metro Routers.</p> <p>Statement introduced in Junos OS Release 17.3 for the QFX Series.</p>
<b>Description</b>	<p>Configure the priority as one of the following:</p> <ul style="list-style-type: none"> <li>• In the slave, the priority value is set to select the best master clock. Note that in order to select a particular master clock, the priority value in the master clock's announce message must be equal to or lower than the configured <i>priority1-value</i>.</li> <li>• In the master, the priority value is set to represent itself in the announce message to other slaves.</li> <li>• In the boundary node, the slave uses this value to determine the best master clock, whereas the master uses this value from the announce message of the selected master clock.</li> </ul> <p>Note that the lower value takes precedence.</p>
<b>Options</b>	<p><i>priority1-value</i>—The priority value of the clock.</p> <p><b>Range:</b> 0 through 255</p> <p><b>Default:</b> 128</p>
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring Precision Time Protocol on page 319</a></li> <li>• <a href="#">Precision Time Protocol Overview on page 256</a></li> <li>• <i>IEEE 1588v2 Precision Timing Protocol (PTP)</i></li> </ul>

## priority2

Syntax	<code>priority2 priority2-value;</code>
Hierarchy Level	<code>[edit protocols ptp]</code>
Release Information	<p>Statement introduced in Junos OS Release 12.2.</p> <p>Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Metro Routers.</p> <p>Statement introduced in Junos OS Release 17.3 for the QFX Series.</p>
Description	<p>Configure the <b>priority2</b> value. This value is used to differentiate and prioritize the master clocks to avoid confusion when the <b>priority1-value</b> is the same for different master clocks in a network.</p> <p>Note that the lower value takes precedence.</p>
Options	<p><b>priority2-value</b>—The priority value of the clock.</p> <p><b>Range:</b> 0 through 255</p> <p><b>Default:</b> 128</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> <li>• <a href="#">Configuring Precision Time Protocol on page 319</a></li> <li>• <a href="#">Example: Configuring Precision Time Protocol on page 325</a></li> <li>• <a href="#">Precision Time Protocol Overview on page 256</a></li> <li>• <i>IEEE 1588v2 Precision Timing Protocol (PTP)</i></li> </ul>

## priority (Clock Synchronization)

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<b>Syntax</b>	<code>priority <i>number</i>;</code>
<b>Hierarchy Level</b>	<code>[edit chassis synchronization source interfaces (external-a   external-b   interface <i>interface-name</i>)]</code> <code>[edit chassis synchronization source interfaces (external   interface <i>interface-name</i>)]</code> <code>[edit chassis synchronization source interfaces (external-0/0   external-1/0   interface <i>interface-name</i>)]</code>
<b>Release Information</b>	Statement introduced in Junos OS Release 11.2R4 for MX Series routers.
<b>Description</b>	<p>Configure the priority of a clock source in relationship to other clock sources to define a network synchronization flow and to help prevent timing loops.</p> <p>When the priority is not specified, the external-a interface has higher default priority than the external-b interface, and the external-b interface has higher default priority than other Gigabit Ethernet or 10-Gigabit Ethernet clock sources, which have the lowest default priority. Any priority you configure is higher than any default priority.</p>
<b>Options</b>	<p><i>number</i>—Set the priority level of the clock source.</p> <p><b>Range:</b> 1 through 5</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">synchronization (MX Series) on page 794</a></li></ul>



## profile-type

QFX Series (AES67 Profile)	profile-type aes67
QFX Series (AES67+SMPTE Profile)	profile-type aes67-smppte
List of Syntax	<a href="#">QFX Series (AES67 Profile) on page 751</a> <a href="#">QFX Series (AES67+SMPTE Profile) on page 751</a> <a href="#">MX Series on page 751</a> <a href="#">QFX Series (Enterprise Profile) on page 751</a> <a href="#">QFX Series (G.8275.2 Enhanced Profile) on page 751</a> <a href="#">QFX Series (SMPTE Profile ) on page 751</a>
MX Series	profile-type (g.8275.1   g.8275.1.enh)
QFX Series (Enterprise Profile)	profile-type enterprise-profile
QFX Series (G.8275.2 Enhanced Profile)	profile-type g.8275.1.enh
QFX Series (SMPTE Profile )	profile-type smppte
Hierarchy Level	[edit protocols ptp]
Release Information	<p>Statement introduced in Junos OS Release 17.1R1.</p> <p>Statement introduced in Junos OS Release 17.3 for the QFX Series.</p>
Description	<p>On the MX Series, configure the G.8275.1 or the enhanced G.8275.1 PTP profile for applications that require accurate phase and time synchronization. This profile supports the architecture defined in ITU-T G.8275 to enable the distribution of phase and time with full timing support and is based on the second version of PTP defined in IEEE 1588.</p> <p>On QFX Series switches that support the enterprise-profile feature, you can configure the enterprise profile, which supports IEEE 1588 PTPv2 transport over multicast IPv4. If you do not specify a profile, the IEEE 1588 default profile is enabled by default.</p> <p>On QFX Series switches that support the G.8275.2 enhanced profile feature, you can configure the G.8275.2 enhanced profile, which supports telecom applications that require accurate phase and time synchronization for phase alignment and time of day synchronization over a wide area network. This profile supports PTP over IPv4 unicast, ordinary and boundary clocks, and unicast negotiation.</p>

On QFX Series switches that support the media profile, you can configure the SMPTE, AES67, and the AES67+SMPTE profiles to support video applications for capture (for example, cameras), video edit, and playback to be used in professional broadcast environments. The standard allows multiple video sources to stay in synchronization across various equipment by providing time and frequency synchronization to all devices. This profile supports PTP over IPv4 multicast and ordinary and boundary clocks.

**Options**    **aes67**—Enable the AES67 PTP profile.

**aes67-smp****pte**—Enable the AES67+SMPTE PTP profile.

**enterprise-profile**—Enable the enterprise profile. The enterprise profile supports IEEE 1588 PTPv2 transport over multicast IPv4. When the enterprise profile is enabled, no other profiles can be enabled. Also, unicast negotiation is disabled when you enable the enterprise profile.

**g.8275.1**—Enable the G.8275.1 PTP profile.

**g.8275.1.enh**—Enable the enhanced G.8275.1 PTP profile. This profile supports PTP over IPv4.

**g.8275.2.enh**—Enable the enhanced G.8275.2 PTP profile. This profile supports PTP over IPv4 unicast.

**smp****pte**—Enable the SMPTE PTP profile.

**Required Privilege Level**    routing—To view this statement in the configuration.  
   routing-control—To add this statement to the configuration.



**Related Documentation**

- [Precision Time Protocol Overview on page 256](#)
- *Configuring the Precision Time Protocol Enterprise Profile*
- *Configuring the Precision Time Protocol G.8275.2 Enhanced Profile (Telecom Profile)*

## pulse-per-second-enable

<b>Syntax</b>	pulse-per-second-enable;
<b>Hierarchy Level</b>	[edit chassis <a href="#">synchronization</a> interfaces external] [edit chassis <a href="#">synchronization</a> interfaces (external-0/0   external-1/0)]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.3 for MX Series routers.
<b>Description</b>	Configure the external interface to receive the pulse per second (PPS) signal on the GPS interface of the router.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">synchronization on page 794</a></li></ul>

## q-pic-large-buffer

Syntax	<code>q-pic-large-buffer (large-scale   small-scale);</code>
Hierarchy Level	<code>[edit chassis fpc slot-number pic pic-number]</code> <code>[edit chassis lcc number fpc slot-number pic pic-number (Routing Matrix)]</code>
Release Information	<p>Statement introduced in Junos OS Release 7.4.</p> <p>Support for TX Matrix and TX Matrix Plus hierarchy added in Junos OS Release 9.6.</p>
Description	<p>Configure delay buffers.</p> <p> <b>NOTE:</b> When you commit the configuration after including the <code>q-pic-large-buffer</code> statement for a PIC, the Junos OS temporarily takes the PIC offline and brings it back online before the new configuration is activated and becomes the current operational configuration.</p>
Default	<code>small-scale</code>
Options	<p><b>large-scale</b>—(Optional) Set the average packet size used to calculate the number of notification queue entries in the IQ PIC to 256 bytes. Useful for slower interfaces (T1, E1, and NxDS0 interfaces configured on Channelized IQ PICs and Gigabit Ethernet VLANs configured on Gigabit Ethernet IQ PICs).</p> <p><b>small-scale</b>—(Optional) Set the average packet size used to calculate the number of notification queue entries in the IQ PIC to 40 bytes.</p> <p> <b>NOTE:</b> You cannot configure the <code>large-scale</code> and the <code>small-scale</code> options on MX Series routers. Include only the <code>q-pic-large-buffer</code> statement to enable the large delay buffer size on Enhanced Queuing DPCs on MX Series routers.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> <li><a href="#">Configuring the Junos OS to Enable Larger Delay Buffers for T1, E1, and DS0 Interfaces Configured on Channelized IQ PICs on page 471</a></li> <li><a href="#">Configuring Schedulers</a></li> </ul>

## quality-level (Clock Synchronization)

<b>Syntax</b>	quality-level (prc   prs   sec   smc   ssu-a   ssu-b   st2   st3   st3e   st4   stu   tnc);
<b>Hierarchy Level</b>	[edit chassis synchronization source interfaces (external-a   external-b   interface <i>interface-name</i> )] [edit chassis synchronization source interfaces (external   interface <i>interface-name</i> )] [edit chassis synchronization source interfaces (external-0/0   external-1/0   interface <i>interface-name</i> )]
<b>Release Information</b>	Statement introduced in Junos OS Release 11.2R4 for MX Series routers.
<b>Description</b>	<p>Configure the quality level for a timing source so that the router knows the best available source with which to synchronize. The quality level specifies the accuracy level of the clock and is transmitted across the network through Synchronization Status Messages (SSMs) over the Ethernet Synchronization Messaging Channel (ESMC), or through SSMs contained in SONET/SDH frames.</p> <p>SONET SSM messages are either Generation 1 or Generation 2. Generation 1 is the first and most widely deployed SSM message set. Generation 2 is a newer version. Quality level options are available for both Generation 1 and Generation 2.</p>
<b>Options</b>	prs—Primary reference source—Stratum 1  st2—Stratum 2  tnc—Transit node clock  st3e—Stratum 3E  st3—Stratum 3  smc—SONET minimum clock  st4—Stratum 4  prc—Primary reference clock  ssu-a—Synchronization supply unit A  ssu-b—Synchronization supply unit B  sec—SDH equipment clock
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.

- Related Documentation**
- [synchronization \(MX Series\) on page 794](#)

## quality-level (hybrid)

<b>Syntax</b>	<code>quality-level (prs   st2   tnc   st3e   st3   smc   st4)   (prc   ssu-a   ssu-b   sec);</code>
<b>Hierarchy Level</b>	<code>[edit protocols ptp slave clock-class-to-quality-level-mapping]</code>
<b>Release Information</b>	Statement introduced in Junos OS Release 12.2R2.
<b>Description</b>	Configure the quality level for the timing source so that the router knows the best available source with which to synchronize. The quality level specifies the accuracy level of the clock.
<b>Options</b>	<p><b>prs</b>—Primary reference source—Stratum 1</p> <p><b>st2</b>—Stratum 2</p> <p><b>tnc</b>—Transit node clock</p> <p><b>st3e</b>—Stratum 3E</p> <p><b>st3</b>—Stratum 3</p> <p><b>smc</b>—SONET minimum clock</p> <p><b>st4</b>—Stratum 4</p> <p><b>prc</b>—Primary reference clock</p> <p><b>ssu-a</b>—Synchronization supply unit A</p> <p><b>ssu-b</b>—Synchronization supply unit B</p> <p><b>sec</b>—SDH equipment clock</p>
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring Hybrid Mode and ESMC Quality Level Mapping on page 329</a></li> <li>• <a href="#">Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 333</a></li> <li>• <a href="#">Understanding Hybrid Mode on page 288</a></li> <li>• <a href="#">Precision Time Protocol Overview on page 256</a></li> <li>• <a href="#">Synchronous Ethernet Overview on page 242</a></li> </ul>

## quality-mode-enable (MX)

Syntax	quality-mode-enable;	
Hierarchy Level	[edit chassis <a href="#">synchronization</a> ]	
Release Information	Statement introduced in Junos OS Release 11.2R4 for MX Series routers.	
Description	<p>Enable Synchronous Ethernet ESMC quality mode. The quality level parameter for a Synchronous Ethernet interface is optional when the <b>quality-mode-enable</b> and the <b>selection-mode received-quality</b> statements are included at the <b>[edit chassis synchronization]</b> hierarchy level.</p> <p>The default quality level for a Synchronous Ethernet interface is based on the value of network option: The <b>option-1</b> statement, when set, selects the <b>sec</b> quality level; and the <b>option-2</b> statement, when set, selects the <b>st3</b> quality level.</p> <p><a href="#">Table 88 on page 757</a> shows whether SSM quality level is supported for a given external interface signal type and framing. The default setting is disabled.</p>	
<i>Table 88: SSM-Quality LevelSupport by Signal Type and Framing</i>		
Signal Type	Framing	SSM Quality Level Supported
E1	G.704	yes
E1	G.704 no CRC4	no
T1	ESF	yes
T1	SF	no
2048 KHz	Not applicable	no
Default	By default, this statement is disabled.	
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.	
Related Documentation	<ul style="list-style-type: none"><li>• <a href="#">synchronization (MX Series) on page 794</a></li><li>• <a href="#">show chassis synchronization on page 2153</a></li></ul>	

## quality-mode-enable (PTX)

---


Syntax	quality-mode-enable;
Hierarchy Level	[edit chassis <a href="#">synchronization (PTX Series)</a> ]
Release Information	Statement introduced in Junos OS Release 14.2R1 for PTX Series routers.
Description	<p>Enable Synchronous Ethernet ESMC quality mode. The quality level parameter for a Synchronous Ethernet interface is optional when the <b>quality-mode-enable</b> and the <b>selection-mode received-quality</b> statements are included at the [edit chassis <b>synchronization</b>] hierarchy level.</p> <p>The default quality level for a Synchronous Ethernet interface is based on the value of the network option: The <b>option-1</b> statement, when included, selects the <b>sec</b> quality level; and the <b>option-2</b> statement, when included, selects the <b>st3</b> quality level.</p>
Default	By default, this statement is not included.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"><li>• <a href="#">synchronization (PTX Series) on page 802</a></li><li>• <a href="#">Synchronizing Internal Stratum 3 Clock to External Clock Sources on PTX Series Routers on page 308</a></li><li>• <a href="#">show chassis synchronization on page 2153</a></li></ul>



## recovered-clock

<b>Syntax</b>	<pre>recovered-clock {   port <i>port-number</i>; }</pre>
<b>Hierarchy Level</b>	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> ]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport Routers.
<b>Description</b>	Select the port where the synchronous clock may be recovered.
<b>Options</b>	<i>port-number</i> —Port number where the synchronous clock may be recovered.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Clock Sources for PTX Series Packet Transport Routers on page 306</a></li> <li>• <a href="#">Synchronizing Internal Stratum 3 Clock to External Clock Sources on PTX Series Routers on page 308</a></li> <li>• <a href="#">synchronization (PTX Series) on page 802</a></li> </ul>

## red-buffer-occupancy

Syntax	<pre>red-buffer-occupancy {     weighted-averaged [ instant-usage-weight-exponent <i>exponent-value</i> ]; }</pre>
Hierarchy Level	<pre>[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> ], [edit chassis lcc <i>number</i> fpc <i>slot-number</i> pic <i>pic-number</i>]</pre>
Release Information	Statement introduced in Junos OS Release 8.3.
Description	<p>Configure the IQ PIC to base random early detection (RED) queue management on a <i>simple moving average</i> buffer occupancy calculation. If you do not include this statement, the IQ PIC bases RED on an <i>instantaneous</i> buffer occupancy value. As an option, you can specify that the IQ PIC bases RED on a <i>weighted moving average</i> of buffer occupancy values.</p> <p>If you configure this feature on a channelized OC12 intelligent queuing (IQ) PIC, the PIC reboots.</p>
Options	<p><b>weighted-averaged</b>—Configure the IQ PIC to base RED processing on a simple moving average of instantaneous buffer occupancy values instead of an instantaneous buffer occupancy.</p> <p><b>instant-usage-weight-exponent <i>exponent-value</i></b>—(Optional) Specify the integer to be used as the negative exponent of 2 to express a weight value. The PIC performs weighted RED (WRED) by based on a calculation of average buffer occupancy that applies the specified weight value to the instantaneous buffer occupancy and then factors the weighted value into the calculation of average buffer occupancy. Valid exponent range is from 1 through 31 (weight values from <math>2^{-1}</math> through <math>2^{-31}</math>). If you do not specify this option, the default exponent value is 0, which results in a weight value of <math>2^0 = 1</math>. With a weight value of 1, the calculation of weighted average buffer occupancy yields the same value as the simple average buffer occupancy.</p>
	<p> <b>NOTE:</b> You can specify an exponent value greater than 31, and the value displays in the output of <code>show</code> commands. However, the PIC replaces the out-of-range value with the <i>operational</i> value of 31, which results in a weight value of <math>2^{-31} = 1 / 2^{31} = 0.0000000004656612873077392578125</math>.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>

- Related Documentation**
- [Managing Transient Traffic Bursts by Configuring Weighted RED Buffer Occupancy](#)
  - [Example: Managing Transient Traffic Bursts by Configuring Weighted RED Buffer Occupancy](#)

## redundancy-mode

<b>Syntax</b>	<code>redundancy-mode (increased-bandwidth   redundant)</code>
<b>Hierarchy Level</b>	[edit chassis fabric]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.2.
<b>Description</b>	(MX240, MX480, and MX960 routers only) Configure the active control boards to be in redundancy mode or increased fabric bandwidth mode. In increased fabric bandwidth mode, which is the default behavior for MX Series routers with Switch Control Board (SCB), the maximum number of available fabric planes are used. The MX Series routers that contain the Enhanced SCB—SCBE—and the MPC3E, the control boards operate in redundancy fabric mode (all the FPCs use 4 fabric planes as active planes) by default.
<b>Options</b>	<p><b>increased-bandwidth</b>—Enable increased fabric bandwidth mode for the control boards, which causes all the available fabric planes to be used.</p> <p><b>redundant</b>—Enable redundancy mode for the control boards, which causes all the FPCs to use 4 fabric planes as active planes.</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Detection and Corrective Actions of Line Cards with Degraded Fabric on MX Series Routers on page 140</a></li> <li>• <a href="#">Detection and Recovery of Fabric-Related Failures Caused by Loss of Connectivity on MX Series Routers on page 135</a></li> <li>• <a href="#">MX Series Routers Fabric Resiliency on page 138</a></li> <li>• <a href="#">show chassis fabric redundancy-mode on page 1553</a></li> <li>• <a href="#">Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 145</a></li> </ul>

## request (Clock Synchronization)

---

<b>Syntax</b>	<code>request (force-switch lockout);</code>
<b>Hierarchy Level</b>	<code>[edit chassis synchronization source interfaces (external-a   external-b   interface <i>interface-name</i>)]</code> <code>[edit chassis synchronization source interfaces (external   interface <i>interface-name</i>)]</code> <code>[edit chassis synchronization source interfaces (external-0/0   external-1/0   interface <i>interface-name</i>)]</code>
<b>Release Information</b>	Statement introduced in Junos OS Release 11.2 R4 for MX Series routers.
<b>Description</b>	Specify the clock selection request criterion.
<b>Options</b>	<p><b>force-switch</b>—Force switching to a clock source, provided the clock source is enabled and not locked out. Only one configured source may be force-switched.</p> <p><b>lockout</b>—Clock source is not considered by the selection process. Lockout may be configured for any source.</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">synchronization (MX Series) on page 794</a></li></ul>

## restart chassis-control

**List of Syntax**    [Syntax on page 763](#)  
                           [Syntax \(MX Series Routers\) on page 763](#)  
                           [Syntax \(PTX Series\) on page 763](#)

**Syntax**    restart chassis-control  
                   <fcc *number* | sfc *number*>  
                   <gracefully | immediately | soft>

**Syntax (MX Series Routers)**    restart chassis-control  
   <gracefully | immediately | soft>

**Syntax (PTX Series)**    restart chassis-control  
                                   <gracefully | immediately | soft>

**Release Information**    Command introduced before JUNOS Release 7.4.  
                                   Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.  
                                   Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.  
                                   Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.  
                                   Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.

**Description**    Restart the chassis management process.



**NOTE:** When GRES is configured and the **restart chassis-control** command is executed on a TX Matrix Plus router with 3D SIBs, we cannot ascertain which Routing Engine becomes a master. This is due to the chassisd restart. The chassis process or chassisd is responsible for maintaining and retaining mastership and when it is restarted, the new chassisd is processed based on the router load. This results in one of the Routing Engines being made master.

**Options**    **fcc *number***—(Routing matrix only) (Optional) Restart the software process for a specific T640 routing node that is connected to a TX Matrix platform. Replace ***number*** with a value from 0 through 3.

**sfc *number***—(TX Matrix Plus routers only) (Optional) Restart the software process on the TX Matrix Plus router (or switch-fabric chassis). Replace ***number*** with 0.

**gracefully**—(Optional) Restart the software process.

**immediately**—(Optional) Immediately restart the software process.



**NOTE:** For PTX Series routers, when the `restart chassis-control` command is executed with the `immediately` option set, the PFE's state will be reset to enabled regardless of whether or not the PFE's state is set to disabled when the action occurs.

**soft**—(Optional) Reread and reactivate the configuration without completely restarting the software processes. For example, Border Gateway Protocol (BGP) peers stay up and the routing table stays constant. Omitting this option results in a graceful restart of the software process.

**Required Privilege Level**    reset

**Related Documentation**    • *restart*

**List of Sample Output**    [restart chassis-control gracefully on page 764](#)  
[restart chassis-control soft on page 764](#)

**Output Fields**    When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### `restart chassis-control gracefully`

```
user@host> restart chassis-control gracefully
Chassis control process started, pid 1631
```

### `restart chassis-control soft`

```
user@host> restart chassis-control soft
Chassis control process started, pid 1653
```

## retry-count

<b>Syntax</b>	<code>retry-count <i>number</i>;</code>
<b>Hierarchy Level</b>	<code>[edit chassis cfeb <i>slot-number</i>]</code> <code>[edit chassis cluster redundancy-group <i>group-number</i> ip-monitoring ]</code> <code>[edit chassis feb <i>slot-number</i>]</code> <code>[edit chassis fpc <i>slot-number</i> sanity-poll]</code> <code>[edit chassis lcc <i>number</i> fpc <i>number</i> sanity-poll]</code> (Routing Matrix)
<b>Release Information</b>	<p>Statement introduced in Junos OS Release 11.4.</p> <p>Statement introduced in Junos OS Release 15.1 on M7i, M10, M120, and M320 routers.</p>
<b>Description</b>	Number of times sanity polling periodically checks for an error condition in the FPC.
<b>Options</b>	<p><b><i>number</i></b>—Number of times sanity polling is allowed to check for an error condition.</p> <p><b>Range:</b> 1 through 30</p> <p><b>Default:</b> 10</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring Sanity Polling on page 511</a></li> <li>• <a href="#">sanity-poll on page 770</a></li> <li>• <a href="#">on-error on page 724</a></li> </ul>

## route (chassis)

---

<b>Syntax</b>	<code>route;</code>
<b>Hierarchy Level</b>	[edit chassis <a href="#">memory-enhanced</a> ]
<b>Release Information</b>	Statement added in Junos OS Release 10.4.
<b>Description</b>	Allocate more jtree memory for routing tables over firewall filters.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels on page 506</a></li></ul>

## routing-engine (Chassis)

---

<b>Syntax</b>	<pre>routing-engine {   on-disk-failure {     disk-failure-action (halt   reboot);   } }</pre>
<b>Hierarchy Level</b>	[edit chassis]
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4. The <b>disk-failure-action</b> statement added in Junos OS Release 9.0.
<b>Description</b>	Configure a Routing Engine to halt or reboot automatically when a hard disk error occurs. A hard disk error may cause a Routing Engine to enter a state in which it responds to local pings and interfaces remain up, but no other processes are responding. Rebooting or halting prevents this.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring the Junos OS to Enable a Routing Engine to Reboot on Hard Disk Errors on page 509</a></li></ul>



---

## route-localization

---

<b>Syntax</b>	<pre>route-localization {   inet;   inet6; }</pre>
<b>Hierarchy Level</b>	[edit chassis]
<b>Release Information</b>	Statement introduced in Junos OS Release 11.4.
<b>Description</b>	Configure FIB localization for IPv4 and IPv6 routes.
<b>Options</b>	<p><b>inet</b>—Configure FIB localization for IPv4 routes.</p> <p><b>inet6</b>—Configure FIB localization for IPv6 routes.</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Example: Configuring Packet Forwarding Engine FIB Localization on page 383</a></li></ul>

## sabit

---

<b>Syntax</b>	<code>sabit <i>bit</i>;</code>
<b>Hierarchy Level</b>	[edit chassis <a href="#">synchronization</a> interfaces external e1-options] [edit chassis <a href="#">synchronization</a> interfaces (external-0/0   external-1/0) e1-options] [edit chassis <a href="#">synchronization</a> interfaces bits e1-options]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.3 for MX Series routers. Statement introduced in Junos OS Release 16.1 for the MX104 router.
<b>Description</b>	Configure the SA bit for exchanging the SSM quality on the E1 interface.
<b>Options</b>	<i>bit</i> —SA bit value. <b>Range:</b> 4 through 8.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">synchronization on page 794</a></li></ul>

## sampling-instance

<b>Syntax</b>	<code>sampling-instance <i>instance-name</i>;</code>
<b>Hierarchy Level</b>	<code>[edit chassis fpc <i>slot-number</i>],</code> <code>[edit chassis lcc <i>number</i> fpc <i>slot-number</i>] (Routing Matrix),</code> <code>[edit chassis member <i>member-number</i> fpc slot <i>slot-number</i>]</code>
<b>Release Information</b>	Statement introduced in Junos OS Release 9.6. Support at the <code>[edit chassis member <i>member-number</i> fpc slot <i>slot-number</i>]</code> hierarchy level introduced in Junos OS Release 14.1. Statement introduced in Junos OS Release 14.1R3 for EX Series switches.
<b>Description</b>	Associate a defined sampling instance with a specific FPC, MPC, or DPC for active sampling instances configured at the <code>[edit forwarding-options sampling]</code> hierarchy level.  For M120 routers with FEB, this statement must also be configured under <code>[edit chassis feb <i>slot-number</i>]</code> , in addition to the <code>[edit forwarding-options sampling]</code> hierarchy level.  In a two-member MX Series Virtual Chassis, the master router (member 0) uses FPC slot numbers 0 through 11 with no offset; the backup router (member 1) uses FPC slot numbers 12 through 23, with an offset of 12.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Associating Sampling Instances for Active Flow Monitoring with a Specific FPC, MPC, or DPC on page 509</a></li> <li>• <a href="#">Inline Flow Monitoring for Virtual Chassis Overview</a></li> </ul>

## sanity-poll

**Syntax**

```
sanity-poll {
  retry-count number;
  on-error {
    raise-alarm;
    power (cycle | off);
    write-coredump;
  }
}
```

**Hierarchy Level**

```
[edit chassis cfeb slot-number]
[edit chassis feb slot-number]
[edit chassis fpc slot-number]
[edit chassis lcc number fpc number] (Routing Matrix)
```

**Release Information** Statement introduced in Junos OS Release 11.4.  
Statement introduced in Junos OS Release 15.1 on M7i, M10, M120, and M320 routers.

**Description** Enable sanity polling and start periodic sanity checking for a particular FPC. The periodic sanity check includes checking for error conditions such as “register sanity issues,” “high temperature,” “hardware failure,” and so on in the FPC.



**NOTE:** Currently, periodic sanity check is performed only on the routing chip register.

**Options** The remaining statements are explained separately. See [CLI Explorer](#).

**Required Privilege Level** interface—To view this statement in the configuration.  
interface-control—To add this statement to the configuration.

**Related Documentation**


- [Configuring Sanity Polling on page 511](#)
- [retry-count on page 765](#)
- [on-error on page 724](#)

## secondary

<b>Syntax</b>	<code>secondary <i>interface name</i>;</code>
<b>Hierarchy Level</b>	[edit protocols ptp <a href="#">slave</a> interface <i>interface-name</i> ], [edit protocols ptp <a href="#">master</a> interface <i>interface-name</i> ]
<b>Release Information</b>	Statement introduced in Junos OS Release 17.2R1.
<b>Description</b>	Configure the secondary member link in an aggregated Ethernet bundle to enable Precision Time Protocol (PTP) over a link aggregation group. PTP switches over to the secondary member in the aggregated Ethernet bundle when the primary aggregated Ethernet link is down.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring Precision Time Protocol on page 319</a></li><li>• <a href="#">Example: Configuring Precision Time Protocol on page 325</a></li><li>• <a href="#">Precision Time Protocol Overview on page 256</a></li></ul>

## selection-mode

---

Syntax	selection-mode (configured-quality   received-quality);
Hierarchy Level	[edit chassis <a href="#">synchronization</a> ]
Release Information	Statement introduced in Junos OS Release 11.2R4 for MX Series routers.
Description	Specify whether the clock source selection must use the configured or the received ESMC or SSM quality level for a qualifying interface. In both the selection modes, the interface qualifies for clock source selection only when the received ESMC or SSM quality level on the interface is equal to or greater than the configured ESMC or SSM quality level for the interface.
Options	<p><b>configured-quality</b>—Set this option to let the clock source selection algorithm to use the ESMC or SSM quality level that is configured for a qualifying interface.</p> <p><b>received-quality</b>—Set this option to let the clock source selection algorithm to use the ESMC or SSM quality level that is received on the qualifying interface.</p>
	<div> <b>NOTE:</b> For the <b>selection-mode</b> statement configuration to take effect, you must set the <b>quality-mode-enable</b> statement at the [edit chassis <a href="#">synchronization</a>] hierarchy level.</div>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"><li>• <a href="#">synchronization on page 794</a></li></ul>

## service-package

<b>Syntax</b>	<pre> service-package {   extension-provider {     control-cores <i>control-number</i>;     data-cores <i>data-number</i>;     data-flow-affinity {       hash-key (layer-3   layer-4);     }     forwarding-db-size <i>size</i>;     object-cache-size <i>size</i>;     package <i>package-name</i>;     policy-db-size <i>size</i>;     syslog {       facility {         severity;         destination <i>destination</i>;       }     }     wired-max-processes <i>num-procs</i>;     wired-process-mem-size <i>mem-size</i>;   }   layer-2;   layer-3; } </pre>
<b>Hierarchy Level</b>	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> <a href="#">adaptive-services</a> ]
<b>Release Information</b>	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced on MX Series 5G Universal Routing Platforms with MS-DPCs in Junos OS Release 9.6.</p>
<b>Description</b>	For adaptive services and multi-services interfaces, enable a service package on the specified Physical Interface Card (PIC).
<b>Options</b>	<p><b>layer-2</b>—Enable a Layer 2 service package on the specified PIC.</p> <p><b>layer-3</b>—Enable a Layer 3 service package on the specified PIC.</p> <p>The remaining statements are explained separately. See <a href="#">CLI Explorer</a>.</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <i>Enabling Service Packages</i></li> <li>• <i>Configuring MS-MPC-Based, Static HTTP Redirect Services</i></li> <li>• <i>Configuring MS-MPC-Based, Converged HTTP Redirect Services</i></li> </ul>

## session-offload

---

<b>Syntax</b>	<code>session-offload;</code>
<b>Hierarchy Level</b>	<code>[edit chassis fpc <i>slot-number</i> pic <i>number</i> adaptive-services service-package extension-provider]</code>
<b>Release Information</b>	Statement introduced on MX Series 5G Universal Routing Platforms with MS-DPCs in Junos OS Release 9.6.
<b>Description</b>	Enable session offloading on a per-PIC basis for a Multiservices PIC.
<b>Default</b>	Session offloading is disabled.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring the Junos OS to Enable Session Offloading on MX Series 5G Universal Routing Platforms with MS-DPCs on page 437</a></li></ul>



## sfm (Chassis)

Syntax	<code>sfm slot-number power off;</code>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>For routers with SFMs, configure an SFM to stay offline.</p> <p>By default, if you use the <b>request chassis sfm</b> CLI command to take an SFM offline, the SFM will attempt to restart when you enter a <b>commit</b> CLI command. To prevent a restart, configure an SFM to stay offline. This feature is useful for repair situations. The SFM remains offline until you delete this statement.</p>
Options	<p><b>slot-number</b>—Slot number in which the SFM is installed.</p> <p><b>power off</b>—Take the SFM offline and configure it to remain offline.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"><li>• <a href="#">Configuring the Junos OS to Make an SFM Stay Offline on page 431</a></li><li>• <i>High Availability Feature Guide</i></li></ul>

## sib

---

<b>Syntax</b>	<pre>sib {   minimum <i>number</i>; }</pre>
<b>Hierarchy Level</b>	[edit chassis]
<b>Release Information</b>	Statement introduced in Junos OS Release 7.4.
<b>Description</b>	Configure the minimum number of SIBs on an M320 router. With this configuration, SIB absent alarms are generated only if the SIB count falls below the minimum specified.
<b>Options</b>	<p><i>number</i>—Minimum number of SIBs on the router.</p> <p><b>Range:</b> 0 through 3</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring the Junos OS to Support Entry-Level Configuration on an M320 Router with a Minimum Number of SIBs and PIMs on page 435</a></li><li>• <a href="#">pem on page 730</a></li></ul>

## signal-type

<b>Syntax</b>	signal-type (1hz   5mhz   10mhz   2048mhz   e1   t1);
<b>Hierarchy Level</b>	[edit chassis <a href="#">synchronization</a> interfaces external] [edit chassis <a href="#">synchronization</a> interfaces (external-0/0   external-1/0)]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.3 for MX Series routers.
<b>Description</b>	Configure the frequency for the provided reference clock.
<b>Options</b>	<p><b>1mhz</b>—Set the signal with a clock frequency of 1 MHz.</p> <p><b>5mhz</b>—Set the signal with a clock frequency of 5 MHz.</p> <p><b>10mhz</b>—Set the signal with a clock frequency of 10 MHz.</p> <p><b>2048khz</b>—Set the signal as an E1 unframed 2048 kHz G.703 signal.</p> <p><b>e1</b>—Set the signal as an E1-coded 2048-kHz signal on a 120-ohm balanced line.</p> <p><b>t1</b>—Set the signal as a T1-coded 1.544-MHz signal on a 100-ohm balanced line.</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">synchronization on page 794</a></li> </ul>

## switchover-mode

---

<b>Syntax</b>	switchover-mode (non-revertive   revertive);
<b>Hierarchy Level</b>	[edit chassis <a href="#">synchronization</a> ]
<b>Release Information</b>	Statement introduced in Junos OS Release 11.2R4 for MX Series routers.
<b>Description</b>	Specify whether the router must switch from a lower-quality clock source to a higher-quality clock source or use the current clock source only.
<b>Default</b>	revertive
<b>Options</b>	<p><b>non-revertive</b>—Set this option so that the router continues to use the current clock source as long as it is valid.</p> <p><b>revertive</b>—Set the option so that the router automatically switches from a lower to a higher quality clock source whenever the higher clock source becomes available.</p>
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">synchronization (MX Series) on page 794</a></li><li>• <a href="#">synchronization (PTX Series) on page 802</a></li></ul>

## slow-pfe-alarm

<b>Syntax</b>	slow-pfe-alarm;
<b>Hierarchy Level</b>	[edit chassis]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.1R6, 12.2R5, 12.3R3, 13.1R2, and 13.2R1.
<b>Description</b>	Enable the slow Packet Forwarding Engine alarm on a M Series, MX Series, or a T Series router.
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring Slow Packet Forwarding Engine Alarm on page 514</a></li> </ul>

## sonet

<b>Syntax</b>	sonet { device-count <i>number</i> ; }
<b>Hierarchy Level</b>	[edit chassis aggregated-devices]
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4.
<b>Description</b>	Configure properties for SONET/SDH aggregated devices on the router.
<b>Options</b>	The remaining statements are explained separately. See <a href="#">CLI Explorer</a> .
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring Junos OS for Supporting Aggregated Devices on page 481</a></li> </ul>

## slave

List of Syntax [MX Series on page 780](#)  
[QFX Series on page 780](#)

**MX Series**

```
slave {
  announce-interval announce-interval-value
  announce-timeout announce-timeout-value;
  delay-request delay-request-value;
  frequency-only;
  hybrid
  interface interface-name {
    unicast-mode {
      transport ipv4;
      clock-source ip-address {
        local-ip-address local-ip-address {
        }
      }
    }
    multicast-mode {
      hybrid
      transport 802.3 link-local;
    }
  }
  sync-interval interval;
}
```

**QFX Series**

```
slave {
  interface interface-name {
    unicast-mode {
      transport ipv4;
      clock-client ip-address {
        local-ip-address local-ip-address;
      }
    }
  }
  multicast-mode {
    transport (ipv4 | ieee-802.3)
    local-ip-address local-ip-address;
    local-priority local-ip-address;
  }
  max-announce-interval max-announce-interval;
  max-delay-response-interval max-delay-response-interval;
  max-sync-interval max-sync-interval;
  min-announce-interval min-announce-interval;
  min-delay-response-interval min-delay-response-interval;
  min-sync-interval min-sync-interval;
  sync-interval sync-interval;
}
```

Hierarchy Level [\[edit protocols ptp\]](#)

**Release Information** Statement introduced in Junos OS Release 12.2.  
Statement introduced in Junos OS Release 17.3 for the QFX Series.

**Description** Configure the slave with parameters.



**NOTE:** Multicast mode is not supported on the QFX Series.

The remaining statements are explained separately. See [CLI Explorer](#).

**Required Privilege Level** routing—To view this statement in the configuration.  
routing-control—To add this statement to the configuration.

**Related Documentation**

- [Configuring Precision Time Protocol on page 319](#)
- [Example: Configuring Precision Time Protocol on page 325](#)
- [Precision Time Protocol Overview on page 256](#)
- [Configuring the Precision Time Protocol G.8275.2 Enhanced Profile \(Telecom Profile\)](#)

## source-mode

**Syntax** `source-mode (chassis | line);`

**Hierarchy Level** [edit chassis [synchronization](#) output interfaces external]  
[edit chassis [synchronization](#) output interfaces (external-0/0 | external-1/0)]

**Release Information** Statement introduced in Junos OS Release 12.3 for MX Series routers.

**Description** Configure the source mode for selecting a clock source as either a chassis clock or the best line clock source as output for the configured BITS interface.

**Options** **chassis**—Set the chassis clock for output.  
**line**—Set the best line clock source for output.

**Required Privilege Level** interface—To view this statement in the configuration.  
interface-control—To add this statement to the configuration.

**Related Documentation**

- [synchronization on page 794](#)

## source interfaces

<b>Syntax</b>	<pre>source interfaces (external   <i>interface-name</i>)   hold-off-time <i>time</i>;   priority <i>number</i>;   quality-level (prc   prs   sec   smc   ssu-a   ssu-b   st2   st3   st3e   st4   stu   tnc);   request (force-switch   lockout);   wait-to-restore <i>minutes</i>; }</pre>
<b>Hierarchy Level</b>	[edit chassis synchronization]
<b>Release Information</b>	Statement introduced in Junos OS Release 11.2R4 for MX Series routers.
<b>Description</b>	<p>Configure the clock source that is used by the clock selection process on an interface.</p> <ul style="list-style-type: none"> <li>• (SCB only) Specify the primary clock source as the external-a interface and the secondary clock source as the external-b interface. The clock source is chosen using the clock selection process.</li> <li>• (SCBE only) Specify the external interface to select the external clock source.</li> <li>• (SCBE2 only) Specify the external-0/0 interface or the external-1/0 interface to select the external clock source.</li> </ul>
<b>Options</b>	The remaining statements are explained separately. See <a href="#">CLI Explorer</a> .
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">synchronization (MX Series) on page 794</a></li> </ul>



## sparse-dlcis

<b>Syntax</b>	<code>sparse-dlcis;</code>
<b>Hierarchy Level</b>	<code>[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i>];</code>
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4.
<b>Description</b>	Support a full data-link connection identifier (DLCI) range (1 through 1022). This enables you to use circuit cross-connect (CCC) and translation cross-connect (TCC) features by means of Frame Relay on T1 and E1 interfaces.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring the Junos OS to Support the Sparse DLCI Mode on Channelized STM1 or Channelized DS3 PICs on page 466</a></li></ul>

## speed

<b>Syntax</b>	<code>speed (oc3-stm1   oc12-stm4   oc48-stm16   100G   10G   40G);</code>
<b>Hierarchy Level</b>	<code>[edit chassis fpc slot-number pic pic-number port port-number]</code>
<b>Release Information</b>	<p>Statement introduced in Junos OS Release 11.2.</p> <p>Support for MPC7E (Multi-Rate) introduced in Junos OS Release 15.1F4.</p> <p>Support for MX10003 MPC introduced in Junos OS Release 17.3R1.</p> <p>Support for MX204 routers introduced in Junos OS Release 17.4R1.</p>
<b>Description</b>	Configure the port speed on MX Series routers. This statement is supported only on MPC7E (Multi-Rate) MPC, SONET/SDH (Multi-Rate) MICs with SFP, Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP, ATM MICs, and MX204 routers.
<b>Default</b>	<code>oc3-stm1</code>
<b>Options</b>	<p><code>oc3-stm1</code>—Supported ports operate at OC3 or STM1 speed.</p> <p><code>oc12-stm4</code>—Supported ports operate at OC12 or STM4 speed.</p> <p><code>oc48-stm16</code>—Supported ports operate at OC48 or STM16 speed.</p> <p><code>100G</code>—Supported ports operate at 100-Gbps speed.</p> <p><code>10G</code>—Supported ports operate at 10-Gbps speed.</p> <p><code>40G</code>—Supported ports operate at 40-Gbps speed.</p>



**NOTE:** You can configure the `oc12-stm4`, `oc3-stm1`, and `oc48-stm16` port speed options for SONET/SDH OC3/STM1 (Multi-Rate) MICs. However, for Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP and ATM MICs, you can configure only the `oc12-stm4` and `oc3-stm1` port speed options.

(MX Series with MPCs and ATM MICs with SFP) To configure up to OC12 CBR bandwidth speed per virtual circuit (VC) on an ATM MIC with SFP (MIC-3D-8OC3-2OC12-ATM), specify `oc12-stm4` as the speed for the specified port. You can configure the `oc12-stm4` port speed option only for ports 0 and 4 on an ATM MIC. If you configure the `oc12-stm4` port speed option for port 0, then ports 1, 2, and 3 are disabled. Similarly, if you configure the `oc12-stm4` port speed for port 4, then ports 5, 6, and 7 are disabled.

(MX Series with MPC7E-MRATE) To configure 100-Gbps, 10-Gbps, or 40-Gbps speed per port on an MPC7E (Multi-Rate) MPC, specify `100G`, `10G`, or `40G`, respectively, as the speed for the specified port. You can configure `10G` and `40G` port speed options

on all the six ports of PIC 0 and PIC 1 of an MPC7E-MRATE MPC. However, you can configure the **100G** port speed option only for ports 2 and 5 of PIC 0 and PIC 1 of an MPC7E-MRATE MPC.

(MX10003 routers with MX10003 MPC) To configure 100 Gbps, 10 Gbps, and 40 Gbps speed on all supported ports, specify 100G, 10G, or 40G, respectively, as the speed for the specified PIC. All the six ports of the fixed port PIC support 10-Gbps and 40-Gbps speeds. All the 12 ports of the Multi-rate MIC support 100-Gbps, 10-Gbps and 40-Gbps speeds. For more information see [“MX10003 MPC on MX10003 Router Overview” on page 43](#) and [“Supported Active Physical Ports for Configuring Rate Selectability to Prevent Oversubscription on MX10003 MPC” on page 192](#).

(MX204 Routers) The MX204 has four rate-selectable ports (referred to a PIC 0 ports) that can be configured as 100-Gigabit Ethernet ports or 40-Gigabit Ethernet port, or each port can be configured as four 10-Gigabit Ethernet ports (by using a breakout cable). The MX204 also has eight 10-Gigabit Ethernet ports (referred to as PIC 1 ports). For more information, see [“MX204 Router Overview” on page 45](#) and [“Supported Active Physical Rate-Selectable Ports to Prevent Oversubscription on MX204 Router” on page 193](#)

**Required Privilege Level** interface—To view this statement in the configuration.  
interface-control—To add this statement to the configuration.

**Related Documentation**

- [Configuring Port Speed on Multi-Rate MICs on page 475](#)
- [Configuring Rate Selectability on MPC7E \(Multi-Rate\) to Enable Different Port Speeds on page 201](#)
- [Configuring Rate Selectability on MX10003 MPC to Enable Different Port Speeds on page 216](#)
- [Configuring Rate Selectability on MX204 to Enable Different Port Speeds on page 220](#)
- [speed \(Gigabit Ethernet interface\) on page 786](#)

## speed (Gigabit Ethernet interface)

<b>Syntax</b>	<code>speed (1G   10G);</code>
<b>Hierarchy Level</b>	[edit interfaces <i>intf-name</i> together-options]
<b>Release Information</b>	Statement introduced in Junos OS Release 18.1R1 for MX10003 and MX204 routers.
<b>Description</b>	<p>Starting in Junos OS Release 18.1R1, on MX10003 and MX204 routers, the 10-Gbps port can operate in 1-Gbps mode also. On MX10003 and MX204 routers, when the port operates in 10-Gbps speed, you can change the operating speed to 1Gbps using the configuration <b>speed 1G</b> in this configuration statement. Once you commit this configuration, the operating speed of the 10-Gbps port changes to 1-Gbps speed.</p> <p>On fixed-port PIC and non-MACsec MIC of MX10003 router, you can configure one or all 10-Gbps port operating in 4X10-Gbps speed to operate in 1-Gbps speed.</p> <p>On MX204 routers, you can configure the 4X10-Gbps port on one of the fixed-port PICs to operate in 1-Gbps mode. And on the other fixed-port PIC, you can configure the 10-Gbps port to 1-Gbps speed.</p> <p>See <a href="#">“MX10003 MPC Rate-Selectability Overview” on page 205</a> and <a href="#">“MX204 Router Rate-Selectability Overview” on page 210</a> for more details.</p> <p>On MX10003 and MX204 routers, 1-Gbps speed is supported with <b>speed 1g</b> configuration. The 1-Gbps speed is only supported in non-autonegotiation mode. For optics other than SFP-T, in 1-Gbps mode, the peer interfaces must be configured to non-autonegotiation mode.</p>



### NOTE:

- On the MX10003 router, the MACsec MIC does not provide 1-Gbps speed. If you attempt to change the operating speed to 1-Gbps, syslog displays that this feature is not supported on the MACsec MIC.
- On MX10003 and MX204 routers, rate selectability at PIC level and port level does not support 1-Gbps speed.
- On MX10003 and MX204 routers, the interface name prefix must be xe.
- On MX10003 and MX204 routers, even after configuring 1-Gbps speed, the protocol continues to advertise the bandwidth as 10-Gigabit Ethernet.
- On MX10003 and MX204 routers, Link Aggregation Group (LAG) is not supported.

To view the speed configured for the interface, execute the `show interfaces extensive` command. The **Speed Configuration** output parameter in the command output indicates

the current operation speed of the interface. If the interface is configured with 1-Gbps speed, then **Speed Configuration** displays 1G; if the interface is configured with 10-Gbps speed, Speed Configuration displays AUTO.

**Default** 10G

**Options** 1G—Supported ports operate at 1-Gbps speed.

10G—Supported ports operate at 10-Gbps speed.

**Required Privilege** interface—To view this statement in the configuration.  
**Level** interface-control—To add this statement to the configuration.

**Related Documentation**

- [Configuring Port Speed on Multi-Rate MICs on page 475](#)
- [MX10003 MPC Rate-Selectability Overview on page 205](#)
- [Configuring Rate Selectability on MX204 to Enable Different Port Speeds on page 220](#)
- [Configuring Rate Selectability on MX10003 MPC to Enable Different Port Speeds on page 216](#)

## speed (24-port and 12-port 10 Gigabit Ethernet PIC)

**Syntax** speed 1G | 10G

**Hierarchy Level** [edit chassis fpc *slot-number* pic *pic-number*]  
[edit chassis fpc *slot-number* pic *pic-number* port *port-number*]  
[edit chassis lcc *number* fpc *slot-number* pic *pic-number* mixed-rate-mode] (Routing Matrix)

**Release Information** Statement introduced in Junos OS Release 13.3.  
Statement introduced in Junos OS Release 15.1 for the PTX Series.

**Description** Configure the port speed on the following interface modules:

- PF-24XGE-SFPP or the PF-12XGE-SFPP PIC on a T4000 standalone router or on an LCC in a TX Matrix Plus routing matrix with 3D SIBs



**NOTE:** To change the port speed from 10 Gbps to 1 Gbps on PF-24XGE-SFPP and PF-12XGE-SFPP PICs, SFP optics is required.

- P1-PTX-24-10GE-SFPP PIC on the PTX3000 router
- P1-PTX-24-10GE-SFPP PIC with the FPC2-PTX-P1A on the PTX5000 router

Dual-rate support for the P1-PTX-24-10GE-SFPP enables you to switch all port speeds to either 1 Gbps or 10 Gbps. The default is 10 Gbps. All ports are configured to the same speed; there is no mixed-rate-mode capability. Changing the port speed causes the PIC to reboot.

To return all ports to the 10-Gbps port speed, use the **delete chassis fpc *fpc-number* pic *pic-number* speed 1G** statement. To check the port speed, use the **show interfaces** command.



**NOTE:** For the 1-Gbps port speed on the P1-PTX-24-10GE-SFPP PIC, you can use either the SFP-1GE-SX or the SFP-1GE-LX transceiver.

**Options** 1 G—1 Gbps  
10 G—10 Gbps

**Required Privilege Level** interface—To view this statement in the configuration.  
interface-control—To add this statement to the configuration.

- Related Documentation**
- *Modes of Operation of 10-Gigabit Ethernet PICs*
  - [Configuring Mixed-Rate Mode Operation on page 474](#)
  - [mixed-rate-mode on page 711](#)

## stateful (MX Series)

**Syntax**

```
stateful {
  interface interface-name {
    multicast-mode
    local-priority
    transport 802.3 ( link-local ) ;
    asymmetry number;
  }
}
```

**Hierarchy Level** [edit protocols ptp]

**Release Information** Statement introduced in Junos OS Release 17.1R1.

**Description** Configure the stateful port or bidirectional port with parameters. A stateful port is useful when you configure PTP over Ethernet for multicast mode of transmission of PTP traffic.

For PTP over Ethernet, you can configure a port to function as both a slave port and a master port. This type of port is called a dynamic port, a stateful port, or a bidirectional port. Such a dynamic port enables the transfer of frequency for synchronization services, in addition to time and phase alignment, when PTP functionality is not hop-by-hop and you have provisioned master and slave roles or interfaces.

**Options** The remaining statements are explained separately. See [CLI Explorer](#).

**Required Privilege Level**

routing—To view this statement in the configuration.

routing-control—To add this statement to the configuration.

- Related Documentation**
- [Precision Time Protocol Overview on page 256](#)
  - *Guidelines for Configuring PTP over Ethernet*
  - *Configuring PTP Multicast Master and Slave Ports for Ethernet Encapsulation*
  - *Configuring PTP Dynamic Ports for Ethernet Encapsulation*

## symmetric-hash

---

<b>Syntax</b>	<pre>symmetric-hash {     complement; }</pre>
<b>Hierarchy Level</b>	[edit chassis fpc slot-number pic slot-number hash-key family inet], [edit chassis fpc slot-number pic slot-number hash-key family multiservice]
<b>Release Information</b>	Statement introduced in Junos OS Release 9.6.
<b>Description</b>	(MX Series 5G Universal Routing Platforms only) Configure the symmetric hash or symmetric hash complement at the PIC level for configuring symmetrical load balancing on an 802.3ad Link Aggregation Group.
<b>Options</b>	<b>complement</b> —Include the complement of the symmetric hash in the hash key.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 489</a></li></ul>



## sync-interval

<b>Syntax</b>	<code>sync-interval <i>sync-interval-value</i>;</code>
<b>Hierarchy Level</b>	[edit protocols ptp <a href="#">master</a> ]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.2.
<b>Description</b>	Configure the logarithmic mean interval for sync interval messages to be sent by the master. By default, 64 sync interval messages are sent per second.
<b>Options</b>	<p><b><i>sync-interval-value</i></b>—The sync interval value for sync interval messages to be sent by the master.</p> <p><b>Range:</b> –6 through +6</p> <p><b>Default:</b> 0</p>
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring Precision Time Protocol on page 319</a></li><li>• <a href="#">Example: Configuring Precision Time Protocol on page 325</a></li><li>• <a href="#">Precision Time Protocol Overview on page 256</a></li></ul>

## synchronization (M Series and T Series)

Syntax	<pre>synchronization {   primary (external-a   external-b   fpc-slot-number   gps-0-10mhz   gps-0-5mhz       gps-1-10mhz   gps-1-5mhz   bits-a   bits-b);   secondary (external-a   external-b   fpc-slot-number   gps-0-10mhz   gps-0-5mhz       gps-1-10mhz   gps-1-5mhz   bits-a   bits-b );   signal-type (t1   e1);   switching-mode (revertive   non-revertive);   transmitter-enable;   validation-interval seconds;   y-cable-line-termination; }</pre>
Hierarchy Level	[edit chassis]
Release Information	<p>Statement introduced in Junos OS Release 7.6.</p> <p>Statement introduced in Junos OS Release 9.3 for M120 routers.</p> <p>Statement introduced in Junos OS Release 10.2 for T320, T640, and T1600 routers.</p>
Description	(M320, M40e, M120, T320, T640, and T1600 routers and PTX Series Packet Transport Routers only) Configure an external synchronization interface to synchronize the internal Stratum 3 clock to an external source, and then synchronize the chassis interface clock to that source.
Options	<p><b>primary</b>—First external timing source specified in the configuration hierarchy. This statement has the following suboptions:</p> <ul style="list-style-type: none"> <li><b>external-a</b>—Use <b>external-a</b> as the primary clock synchronization source.</li> <li><b>external-b</b>—Use <b>external-b</b> as the primary clock synchronization source.</li> <li><b>fpc-slot-number</b>—Use <b>fpc-slot-number</b> as the primary clock synchronization source. For the PTX5000 Packet Transport Router, replace <i>slot-number</i> with a value from 0 through 7.</li> <li><b>gps-0-10mhz</b>—Use <b>gps-0-10mhz</b> as the primary clock synchronization source.</li> <li><b>gps-0-5mhz</b>—Use <b>gps-0-5mhz</b> as the primary clock synchronization source.</li> <li><b>gps-1-10mhz</b>—Use <b>gps-1-10mhz</b> as the primary clock synchronization source.</li> <li><b>gps-1-5mhz</b>—Use <b>gps-1-5mhz</b> as the primary clock synchronization source.</li> <li><b>bits-a</b>—Use <b>bits-a</b> as the primary clock synchronization source.</li> <li><b>bits-b</b>—Use <b>bits-b</b> as the primary clock synchronization source.</li> </ul> <p><b>secondary</b>—Second external timing source specified in the configuration hierarchy.</p>

- **external-a**—Use **external-a** as the secondary clock synchronization source.
- **external-b**—Use **external-b** as the secondary clock synchronization source.
- **fpc-slot-number**—Use **fpc-slot-number** as the secondary clock synchronization source. For the PTX5000 Packet Transport Router, replace *slot-number* with a value from 0 to 7.
- **gps-0-10mhz**—Use **gps-0-10mhz** as the secondary clock synchronization source.
- **gps-0-5mhz**—Use **gps-0-5mhz** as the secondary clock synchronization source.
- **gps-1-10mhz**—Use **gps-1-10mhz** as the secondary clock synchronization source.
- **gps-1-5mhz**—Use **gps-1-5mhz** as the secondary clock synchronization source.
- **bits-a**—Use **bits-a** as the secondary clock synchronization source.
- **bits-b**—Use **bits-b** as the secondary clock synchronization source.

**signal-type**—Specify the line encoding mode for interfaces: either **t1** or **e1**. For the M40e router, only the **t1 signal-type** mode is supported.

**Default:** t1

**switching-mode**—Specify **revertive** if a lower-priority synchronization can be switched to a valid, higher-priority synchronization.

**Default:** non-revertive

**transmitter-enable**—(M320 routers only) Control whether the diagnostic timing signal is transmitted.

**validation-interval**—Validate the synchronized deviation. If revertive switching is enabled and a higher-priority clock is validated, the clock module is directed to the higher-priority clock, and all configured and active synchronizations are validated. The validation timer resumes after the current validation interval expires. This feature is not supported on PTX Series Packet Transport Routers.

**Range:** (M320, M40e, T320, T640, T1600 routers) 90 through 86,400 seconds. (M120 routers) 30 through 86,400 seconds.

**Default:** (M320, M40e, T320, T640, T1600 routers) 90 seconds. (M120 routers) 30 seconds

**y-cable-line-termination**—(M320 routers only) Specify that a single signal be wired to both Control Boards (CBs) using a Y-cable.

**Required Privilege Level** interface—To view this statement in the configuration.  
interface-control—To add this statement to the configuration.

**Related Documentation** • [Configuring Junos OS to Support an External Clock Synchronization Interface for M Series, MX Series, and T Series Routers on page 292](#)

## synchronization (MX Series)

```

Syntax synchronization {
  clock-mode (auto-select | free-run);
  esmc-transmit {
    interfaces (all | interface-name);
  }
  hold-interval {
    configuration-change seconds;
    restart seconds;
    switchover seconds;
  }
  interfaces {
    external | (external-0/0 | external-1/0) {
      e1-options {
        framing (g704 | g704-no-crc4);
        line-encoding (ami | hdb3);
        sabit number;
      }
      pulse-per-second-enable;
      signal-type (2048khz | e1 | t1);
      t1-options {
        framing (esf | sf);
        line-encoding (ami | b8zs);
      }
    }
    bits {
      e1-options {
        framing (g704 | g704-no-crc4);
        sabit number;
      }
    }
  }
}
max-transmit-quality-level quality-level
network-option (option-1 | option-2);
output {
  interfaces (external | (external-0/0 | external-1/0)) {
    holdover-mode-disable;
    minimum-quality (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc);
    source-mode (chassis | line);
    tx-dnu-to-line-source-enable;
    wander-filter-disable;
  }
}
port auxiliary client {
  time-of-day-format {
    ascii <string>;
  }
}
quality-mode-enable;
selection-mode (configured-quality | received-quality);
source {

```

```

interfaces (interface-name | (bits | external | (external-0/0 | external-1/0))) {
    priority number;
    quality-level (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc);
    request (force-switch | lockout);
}
}
switchover-mode (revertive | non-revertive);
}

```

**Hierarchy Level** [edit chassis]

**Release Information** Statement introduced in Junos OS Release 10.4.  
Statement introduced in Junos OS Release 17.3R1 for MX10003 router.  
Options **interfaces**, **output**, and **source interfaces external** introduced in Junos OS Release 12.3.

**Description** (MX5-T, MX10-T, MX40-T, MX80-T, MX240, MX480, MX960 , and MX10003 routers)  
Configure Synchronous Ethernet parameters. For configuration details, see [“Configuring Clock Synchronization Interface on MX Series Routers” on page 293](#).

(MX240, MX480, MX960, and MX2020 routers with SCBE or SCBE2) Configure centralized clocking parameters.

- Starting in Junos 12.2, configure distribution of the selected chassis clock source to downstream network elements through supported line interfaces.
- Starting in Junos 12.3, configure an external building-integrated timing supply (BITS) timing source. You can also configure the selected chassis clock, or an incoming Synchronous Ethernet or PTP line source for transmission out the external interface.
- Starting in Junos 16.1 for the MX104 routers, SSM is supported on the BITS interface and can be configured at the **[edit chassis [synchronization](#) interfaces bits e1-options]** hierarchy level.

For configuration details, see [“Example: Configuring Centralized Clocking on the Enhanced MX Switch Control Board” on page 340](#).



**NOTE:**

- Unified ISSU is not supported when clock synchronization is configured for Synchronous Ethernet.
- The commit operation fails if you configure bits as source, without first configuring bits interface.

**Options** **clock-mode (auto-select | free-run)**—Specify the mode of operation to select the clock source either from a free-run local oscillator or from an external qualified clock. On MX240, MX480, and MX960 routers with enhanced MPCs, the free-run clock is provided by a local oscillator. On other MX Series routers, the free-run clock is provided by the SCB. The default setting is auto-select mode.

**esmc-transmit interfaces (all | interface-name)**—Enable Ethernet Synchronization Message Channel (ESMC) packet transmission.

**hold-interval (configuration-change | restart | switchover) seconds**—Specify the chassis synchronization hold interval type and clock selection wait time:

- **configuration-change**—Clock select wait time after change in configuration. The range is 15 through 60 seconds.
- **restart**—Clock select wait time after reboot. The range is 60 through 180 seconds. The default is 120 seconds.
- **switchover**—Switchover wait time after clock recovery. The range is 30 to 60 seconds. The default is 30 seconds.

**interfaces (external | (external-0/0 | external-1/0))**—Configure the external interface for operating with a connected external device. This interface can be configured as a clock source, which then becomes a candidate for selection as the chassis clock source by the clock source selection algorithm.

- **signal-type (1mhz | 5mhz | 10mhz | 2048khz | e1 | t1)**—Specify the external interface signal type:
  - a. **1mhz**—Set the signal with a clock frequency of 1 MHz.
  - b. **5mhz**—Set the signal with a clock frequency of 5 MHz.
  - c. **10mhz**—Set the signal with a clock frequency of 10 MHz.
  - d. **2048khz**—Set the signal with a clock frequency of 2048 kHz.
  - e. **e1**—Set the signal as an E1-coded 2048 kHz signal on a 120-ohm balanced line.
  - f. **t1**—Set the signal as a T1-coded 1.544 MHz signal on a 100-ohm balanced line.
- **e1-options**—Specify the E1 options:
  - a. **framing (g704 | g704-no-crc4)**—Specify the framing format:
    - **g704**—G.704 framing format for E1 interfaces
    - **g704-no-crc4**—G.704 framing with no CRC4 for E1 interfaces
  - b. **line-encoding (ami | hdb3)**—Specify the line encoding:
    - **ami**—Alternate mark inversion (AMI)
    - **hdb3**—High-density bipolar 3 code (HDB3)
  - c. **sabit number**—Specify the San synchronization status bit used for exchanging SSN quality. The value can be 4, 5, 6, 7, or 8. The default is 4.

- **t1-options**—Specify the T1 options:
    - a. **framing (esf | sf)**—Specify the framing format:
      - **esf**—Extended superframe (ESF)
      - **sf**—Superframe (SF)
    - b. **line-encoding (ami | b8zs)**—Specify the line encoding:
      - **ami**— Alternate mark inversion (AMI)
      - **b8zs**—8-bit zero suppression, bipolar with 8-zero substitution (B8ZS)
- max-transmit-quality-level**—Specify the threshold quality level for the entire system. If the received quality level is below the threshold quality level then the router will send out a received quality level of SEC. The available quality levels are **PRC**, **PRS**, **SEC**, **SMC**, **SSU-A** **SSU-B** **ST2**, **ST3**, **ST3E**, **ST4**, **STU**, and **TNC**.
- network-option (option-1 | option-2)**—Specify the synchronization networking:
- **option-1**— EEC-1 maps to G.813 option 1 clock
  - **option-2**—EEC-2 maps to G.812 type IV clock

**output interfaces external**—(SCBE only) Specify the properties of the external output interface:

**output interfaces (external-0/0 | external-1/0)**—(SCBE2 only) Specify the properties of the external output interface:

- **holdover-mode-disable**—Disable holdover.
- **minimum-quality (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc)**—Specify the minimum quality level threshold for selection of this clock (see [Table 56 on page 271](#)). If the quality level of the output clock source drops below the configured minimum quality level threshold, the external output clock is squelched.

*Table 89: Quality Levels*

Quality Level	Description
<b>prc</b>	Timing quality of a primary reference clock (option-1 only).
<b>prs</b>	Clock traceable to a primary reference source (option-2 only).
<b>sec</b>	Timing quality of an SDH equipment clock (option-1 only).
<b>smc</b>	Clock traceable to a self-timed SONET (option-2 only).
<b>ssu-a</b>	Timing quality of a type I or IV slave clock (option-1 only).
<b>ssu-b</b>	Timing quality of a type VI slave clock (option-1 only).
<b>st2</b>	Clock traceable to Stratum 2 (option-2 only).
<b>st3</b>	Clock traceable to Stratum 3 (option-2 only).
<b>st3e</b>	Clock traceable to Stratum 3E (option-2 only).
<b>st4</b>	Clock traceable to Stratum 4 free-run (option-2 only).
<b>stu</b>	Clock traceable to an unknown quality (option-2 only).
<b>tnc</b>	Clock traceable to a transit node clock (option-2 only).

- **source-mode (chassis | line)**—Specify source mode for selecting source to output:
  - a. **chassis**—Chassis clock for output
  - b. **line**—Best line clock source for output
- **tx-dnu-to-line-source-enable**—Set Tx quality level to DNU/DUS on line source interface that has been selected as the external output source.
- **wander-filter-disable**—Disable wander filtering.



**quality-mode-enable**—Specify the clock selection, quality level, and priority setting. The quality level parameter for a Synchronous Ethernet interface is optional when quality mode is enabled and the selection mode is set to **received-quality**. The default quality level for a Synchronous Ethernet interface is based on the value of **network-option**: **option-1** selects **SEC** and **option-2** selects **ST3**. Table 88 on page 757 shows whether SSM quality level is supported for a given external interface signal type and framing. The default setting is disabled.

Table 90: SSM-Quality Level Support by Signal Type and Framing

Signal Type	Framing	SSM Quality Level Supported
E1	G.704	yes
E1	G.704 no CRC4	no
T1	ESF	yes
T1	SF	no
2048 KHz	Not applicable	no

**selection-mode (configured-quality | received-quality)**—Specify whether the clock source selection should use the configured or received ESMC or SSM quality level for a qualifying interface. In both selection modes, the interface qualifies for clock source selection only when the received ESMC or SSM quality level on the interface is equal to or greater than the configured ESMC or SSM quality level for the interface.



**NOTE:** For the **selection-mode** statement configuration to take effect, you must set the **quality-mode-enable** statement at the [edit chassis synchronization] hierarchy level.

- a. **configured-quality**—The clock source selection algorithm uses the ESMC or SSM quality level configured for a qualifying interface.
- b. **received-quality**—The clock source selection algorithm uses the ESMC or SSM quality level received on the qualifying interface.

**source** (**external-a** | **external-b** | **interfaces** (*interface-name*) | **external** | (**external-0/0** | **external-1/0**))—Specify clock sources.

(SCB only) The primary clock source is external-a interface, the secondary clock source is external-b interface. The clock source is chosen using the clock selection process.

(SCBE only) Specify the external interface to select the external clock source.

(SCBE2 only) Specify the external-0/0 interface or external-1/0 interface to select the external clock source.

- **priority number**—Specify a priority level from 1 to 5. When not specified, **external-a** has higher default priority than external-b interface, and external-b interface has higher default priority than other Gigabit Ethernet or 10-Gigabit Ethernet clock sources, which have the lowest default priority. Any priority you configure is higher than any default priority.
- **quality-level** (**prc** | **prs** | **sec** | **smc** | **ssu-a** | **ssu-b** | **st2** | **st3** | **st3e** | **st4** | **stu** | **tnc**)—Specify the **quality-level** option based on the configured **network-option**. For quality level details, see [Table 56 on page 271](#).



**NOTE:** Starting with Junos OS Release 12.2R1, the **quality-level** parameter for a Synchronous Ethernet interface is optional when quality mode is enabled and the selection mode is set to received quality. The default quality level for a Synchronous Ethernet interface is SEC for the option-1 network type and ST3 for the option-2 network type.

Both option I and option II SSM quality levels are supported:

- For option-1, quality level must be configured for external clocks (**external-a** or **external-b**) whether or not quality level is enabled.
  - For option-2, the default quality level for external clocks is QL\_STU whether or not quality level is enabled.
  - Quality level is set to DNU for network-option 1 and set to DUS for network-option 2, if quality-level is not configured and no ESMC messages are received.
  - On the selected active source (primary or secondary, whichever is active), even if ESMC transmit is not enabled, a DNU ESMC will be sent out if network-option is 1, and DUS ESMC will be sent out if network-option is 2. This is applicable only for sources of Ethernet interface type to avoid source looping.
- **request force-switch**—Force a switch to this source if the source is enabled and not locked out. You can configure only one source to be force-switched.
  - **request lockout**—You can configure lockout for any source. When configured, this source is not considered by the clock selection process.

**switchover-mode (revertive | non-revertive)**—Specify revertive or non-revertive switchover mode:

- In revertive mode (the default), the system switches from a lower to a higher quality clock source whenever the higher quality clock source becomes available.
- In non-revertive mode, the system continues to use the current clock source as long as it is valid.

**port auxiliary time-of-day-format ascii *string***—Specify time of day (TOD) format as a string of ASCII characters.

**Required Privilege Level** interface—To view this statement in the configuration.  
interface-control—To add this statement to the configuration.

**Related Documentation**

- [Synchronous Ethernet Overview on page 242](#)
- [show chassis synchronization \(MX Series Routers\) on page 2161](#)
- [Configuring Clock Synchronization Interface on MX Series Routers on page 293](#)
- [Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 316](#)
- [Example: Configuring Centralized Clocking on the Enhanced MX Switch Control Board on page 340](#)
- [Example: Configuring Centralized Clocking on an MX2020 on page 349](#)
- [request chassis synchronization mode on page 910](#)
- [Clock Sources for PTX Series Packet Transport Routers on page 306](#)

## synchronization (PTX Series)

<b>Syntax</b>	<pre> synchronization {   clock-mode (auto-select   free-run);   esmc-transmit {     interfaces (all   <i>interface-name</i>);   }   global-wait-to-restore <i>minutes</i>;   hold-interval {     configuration-change <i>seconds</i>;     restart <i>seconds</i>;     switchover <i>seconds</i>;   }   interfaces (bits-a   bits-b   gps-0   gps-1) (pulse-per-second-enable   signal-type     (5mhz 10mhz e1 t1));   max-transmit-quality-level (prc   prs   sec   ssu-a   ssu-b   st2   st3e   stu   tnc);   network-option (option-1   option-2);   primary (fpc-slot-number   gps-0   gps-1   bits-a   bits-b);   quality-mode-enable;   secondary (fpc-slot-number   gps-0   gps-1   bits-a   bits-b);   selection-mode (configured-quality   received-quality);   source (bits-a   bits-b   gps-0   gps-1) {     priority <i>number</i>;     quality-level (prc   prs   sec   smc   ssu-a   ssu-b   st2   st3   st3e   st4   stu   tnc);     request (force-switch   lockout);   }   switchover-mode (revertive   non-revertive); } </pre>
<b>Hierarchy Level</b>	[edit chassis]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport Routers.
<b>Description</b>	Configure Synchronous Ethernet parameters.
<b>Options</b>	The remaining statements are explained separately. See <a href="#">CLI Explorer</a> .
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Synchronous Ethernet Overview on page 242</a></li> <li>• <a href="#">Synchronizing Internal Stratum 3 Clock to External Clock Sources on PTX Series Routers on page 308</a></li> <li>• <a href="#">request chassis synchronization switch on page 912</a></li> <li>• <a href="#">Clock Sources for PTX Series Packet Transport Routers on page 306</a></li> </ul>

- [Understanding Clock Synchronization on page 263](#)

## synchronous-ethernet-mapping

<b>Syntax</b>	<pre>synchronous-ethernet-mapping {   clock-source <i>ip-address</i> {     interface <i>interface1-name</i>;     interface <i>interface2-name</i>;   } }</pre>
<b>Hierarchy Level</b>	[edit protocols ptp slave hybrid]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.2R2.
<b>Description</b>	<p>Configure the Synchronous Ethernet mapping for hybrid mode.</p> <p>The remaining statements are explained separately. See <a href="#">CLI Explorer</a>.</p>
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring Hybrid Mode and ESMC Quality Level Mapping on page 329</a></li> <li>• <a href="#">Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 333</a></li> <li>• <a href="#">Understanding Hybrid Mode on page 288</a></li> <li>• <a href="#">Precision Time Protocol Overview on page 256</a></li> <li>• <a href="#">Synchronous Ethernet Overview on page 242</a></li> </ul>

## system-priority

<b>Syntax</b>	<code>system-priority <i>priority</i>;</code>
<b>Hierarchy Level</b>	[edit chassis aggregated-devices ethernet lacp]
<b>Release Information</b>	Statement introduced in Junos OS Release 9.3. Statement introduced in Junos OS Release 11.4 for EX Series switches.
<b>Description</b>	<p>Define LACP system priority for aggregated Ethernet interfaces at the global (chassis) level.</p> <p>The device with the lower system priority value determines which links between LACP partner devices are active and which are in standby for each LACP group. The device on the controlling end of the link uses port priorities to determine which ports are bundled into the aggregated bundle and which ports are put in standby mode. Port priorities on the other device (the noncontrolling end of the link) are ignored. In priority comparisons, numerically lower values have higher priority. Therefore, the system with the numerically lower value (higher priority value) for LACP system priority becomes the controlling system. If both devices have the same LACP system priority (for example, they are both configured with the default setting of 127), the device MAC address determines which switch is in control.</p>
<b>Options</b>	<p><b><i>priority</i></b>—Priority for the aggregated Ethernet system. A smaller value indicates a higher priority.</p> <p><b>Range:</b> 0 through 65535</p> <p><b>Default:</b> 127</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring Junos OS for Supporting Aggregated Devices on page 481</a></li> <li>• <a href="#">Configuring LACP Link Protection of Aggregated Ethernet Interfaces for Switches</a></li> </ul>

## t1

<b>Syntax</b>	<pre>t1 <i>link-number</i> {   <i>channel-group</i> <i>channel-number</i> timeslots <i>slot-number</i>; }</pre>
<b>Hierarchy Level</b>	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> ct3 port <i>port-number</i> ];
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4.
<b>Description</b>	Configure channelized T1 port and channel specifications.
<b>Options</b>	<p><i>link-number</i>—T1 link.</p> <p><b>Range:</b> 0 through 27 for DS0 naming</p> <p>The remaining statements are explained separately.</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 495</a></li> </ul>


## t1-options

---

<b>Syntax</b>	<pre>t1-options {   framing (esf   sf);   line-encoding (ami   b8zs); }</pre>
<b>Hierarchy Level</b>	<pre>[edit chassis <a href="#">synchronization</a> interfaces external] [edit chassis <a href="#">synchronization</a> interfaces (external-0/0   external-1/0) e1-options]</pre>
<b>Release Information</b>	Statement introduced in Junos OS Release 12.3 for MX Series routers.
<b>Description</b>	Configure the T1 interface options.
<b>Options</b>	The remaining statements are explained separately. See <a href="#">CLI Explorer</a> .
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">synchronization on page 794</a></li></ul>



## threshold

<b>Syntax</b>	<code>threshold <i>threshold-value</i>;</code>
<b>Hierarchy Level</b>	<p>[edit chassis <code>fpc slot-number error fatal</code>]</p> <p>[edit chassis <code>fpc slot-number error major</code>]</p> <p>[edit chassis <code>fpc slot-number error minor</code>]</p> <p>[edit chassis <code>error fatal</code>]</p> <p>[edit chassis <code>error major</code>]</p> <p>[edit chassis <code>error minor</code>]</p>
<b>Release Information</b>	<p>Statement introduced for PTX Series routers in Junos OS Release 13.3.</p> <p>Statement introduced for MX240, MX480 MX960, and MX2020 routers in Junos OS Release 14.2.</p>
<b>Description</b>	<p>Configure the threshold value at which to take action. If the severity level of the error is fatal, the action is carried out only once when the total number of errors crosses the threshold value. If the severity level of the error is major, the action is carried out once after the occurrence crosses the threshold. If the severity level is minor, the action is carried out as many times as the value specified by the threshold. For example, when the severity level is minor, and you have configured the threshold value as 10, the action is carried out after the tenth occurrence.</p>
	<p> <b>NOTE:</b> You can set the threshold value to 0 for errors with severity level as minor. This implies that no action is taken for that error. You cannot set the threshold value to 0 for errors with severity level as major or fatal.</p>
<b>Default</b>	By default, the error count for fatal and major actions is 1. The default error count for minor actions is 10.
<b>Options</b>	<p><b><i>number</i></b>—Specify the threshold of error counts at which to take action.</p> <p><b>Range:</b> 0 through 4,294,967,295</p>
<b>Required Privilege Level</b>	<p><b>interface</b>—To view this statement in the configuration.</p> <p><b>interface-control</b>—To add this statement to the configuration.</p>

- Related Documentation**
- [Fabric Resiliency and Degradation on page 132](#)
  - [show chassis fpc errors on page 1718](#)
  - [Configuring FPC Error Levels and Actions on page 455](#)

## traffic-manager

**List of Syntax**   [Syntax \(MX Series, PTX Series\) Configure Queue Monitoring on page 809](#)  
[Syntax \(MX Series, T Series\) on page 809](#)  
[Syntax \(M Series\) on page 809](#)  
[Syntax \(vSRX\) on page 810](#)

**Syntax (MX Series, PTX Series) Configure Queue Monitoring**

```
traffic-manager {
  egress-shaping-overhead number;
  ingress-shaping-overhead number;
  mode {
    egress-only;
    ingress-and-egress;
    session-shaping;
  }
  enhanced-priority-mode;
  no-enhanced-priority-mode;
  packet-timestamp {
    enable;
  }
  queue-threshold {
    fabric-queue {
      priority high/low {
        threshold threshold-percentage;
      }
    }
    wan-queue {
      priority high/medium-high/medium-low/low {
        threshold threshold-percentage;
      }
    }
  }
}
```

**Syntax (MX Series, T Series)**

```
traffic-manager {
  egress-shaping-overhead number;
  ingress-shaping-overhead number;
  mode {
    egress-only;
    ingress-and-egress;
  }
}
```

**Syntax (M Series)**

```
traffic-manager {
  egress-shaping-overhead number;
  ingress-shaping-overhead number;
  mode {
    egress-only;
    ingress-and-egress;
    session-shaping;
  }
}
```

```
}  
}
```

**Syntax (vSRX)**

```
traffic-manager {  
    egress-shaping-overhead number;  
}
```

**Hierarchy Level**

```
[edit chassis fpc slot-number],  
[edit chassis fpc slot-number pic pic-number],  
[edit chassis lcc number fpc slot-number pic pic-number] (Routing Matrix)
```

**Release Information** Statement introduced in Junos OS Release 8.3.

**Description** Enable CoS queuing, scheduling, and shaping on an L2TP session.



**NOTE:** Committing changes to `traffic-manager` automatically restarts any necessary components (PICs, DPCs, or FPCs).

---

**Options** **queue-threshold**—Enable monitoring of Fabric and WAN queues. When the **fabric-queue** statement is configured, an SNMP trap is generated whenever the fabric power utilization exceeds the configured threshold value.

When **wan-queue** is configured, an SNMP trap is generated whenever the WAN queue depth exceeds the configured threshold value.

**egress-shaping-overhead number**—When traffic management (queueing and scheduling) is configured on the egress side, the number of CoS shaping overhead bytes to add to the packets on the egress interface.

Replace **number** with a value from **-63** through **192** bytes.

For vSRX, replace **number** with a value from **-62** through **192** bytes.



**NOTE:** The L2 headers (DA/SA + VLAN tags) are automatically a part of the shaping calculation.

**ingress-shaping-overhead number**—When L2TP session shaping is configured, the number of CoS shaping overhead bytes to add to the packets on the ingress side of the L2TP tunnel to determine the shaped session packet length.

When session shaping is not configured and traffic management (queueing and scheduling) is configured on the ingress side, the number of CoS shaping overhead bytes to add to the packets on the ingress interface.

Replace **number** with a value from **-63** through **192** bytes.

**mode**—Configure CoS traffic manager mode of operation. This option has the following suboptions:

- **egress-only**—Enable CoS queueing and scheduling on the egress side for the PIC that houses the interface. This is the default mode for an Enhanced Queueing (EQ) DPC on MX Series routers.



**NOTE:** If ingress packet drops are observed at a high rate for an IQ2 or IQ2E PIC, configure the **traffic-manager** statement to work in the **egress-only** mode.

- **ingress-and-egress**—Enable CoS queueing and scheduling on both the egress and ingress sides for the PIC. This is the default mode for IQ2 and IQ2E PICs on M Series and T Series routers.



**NOTE:**

- For EQ DPCs, you must configure the **traffic-manager** statement with **ingress-and-egress** mode to enable ingress CoS on the EQ DPC.

- EQ DPCs have 250 ms of buffering, with only egress queueing (default mode). When ingress-and-egress is configured, the buffer is partitioned as 50 ms for the ingress direction and 200 ms for the egress direction.

- 
- **session-shaping**—(M Series routers only) Configure the IQ2 PIC mode for session-aware traffic shaping to enable L2TP session shaping.

**enhanced-priority-mode**—Enable the enhanced priority mode. When you enable the enhanced priority mode, the scheduler supports four additional per-priority shaping rates and two additional excess priorities at the interface and interface set level. The four additional per-priority shaping rates are: Guaranteed Strict-high, Guaranteed Medium-low, Excess medium-high, and Excess medium-low. The two additional excess priorities are: Excess-rate Medium- high and Excess-rate Medium-low. This is the default mode for PTX Series routers.

**no-enhanced-priority-mode**—Disable the enhanced priority mode. This is the default mode for MX Series routers.



**NOTE:** The line card reboots when you enable or disable the enhanced priority mode feature.

---

<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
---------------------------------	---

<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <i>Configuring CoS for L2TP Tunnels on ATM Interfaces</i></li><li>• <i>Enabling a Timestamp for Ingress and Egress Queue Packets</i></li><li>• <i>show interfaces queue</i></li></ul>
------------------------------	---

## transport 802.3 (PTP Multicast Master and Slave)

<b>Syntax</b>	transport 802.3 link-local;
<b>Hierarchy Level</b>	[edit protocols ptp <b>slave</b> interface <i>interface-name</i> <b>multicast-mode</b> ], [edit protocols ptp <b>master</b> interface <i>interface-name</i> <b>multicast-mode</b> ]
<b>Release Information</b>	Statement introduced in Junos OS Release 15.1 for MX Series routers.
<b>Description</b>	Configure Ethernet as the encapsulation type for transport of Precision Time Protocol (PTP) packets. Ethernet encapsulation type is supported for multicast mode of transmission of PTP packets.



**NOTE:** The **transport** statement is mandatory in the configuration of a master or slave clock.

**Options**    **802.3**—Enable encapsulation for PTP packet transport in multicast mode.



**NOTE:** The **link-local** statement is not supported on the QFX Series.

**link-local**—Enable master or slave to choose either of the two MAC addresses defined in the IEEE 1588-2008 standard. When you configure this option, the system attempts to use the 01-80-C2-00-00-0E MAC address (link-local multicast address) for multicast transmission. This address is contained in the Ethernet frame portion of the PTP packet that contains the Destination MAC field and is expected to be flooded by all types of Ethernet bridges and switches and also by a large number of base station vendors. A node with this MAC address can be a node that does not process PTP packets.

If the link-local multicast address is not available, the standard Ethernet multicast address 01-1B-19-00-00-00 address is used as a second priority. The standard Ethernet multicast address, which is a reserved address in the IEEE 802.1Q standard for Ethernet encapsulation that is required to be filtered and not forwarded, is used in the Destination MAC field of the PTP packets. This MAC address is used to ensure complete end-to-end support of PTP, instead of transmission of packets through any network element that does not support PTP. This address is the default address for G.8275.1 (PTP profile for time or phase distribution), and a node with this MAC address is a node that supports processing of PTP packets.

**Required Privilege Level**    routing—To view this statement in the configuration.  
   routing-control—To add this statement to the configuration.

- Related Documentation**
- [Configuring Precision Time Protocol on page 319](#)
  - [Example: Configuring Precision Time Protocol on page 325](#)
  - [Precision Time Protocol Overview on page 256](#)

---

## transport (slave)

---

<b>Syntax</b>	transport ipv4 ipv6;
<b>Hierarchy Level</b>	[edit protocols ptp <b>slave</b> interface <i>interface-name</i> <b>unicast-mode</b> ]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.2.
<b>Description</b>	<p>Configure the encapsulation type for Precision Time Protocol (PTP) packet transport. Both, IPv4 and IPv6 are the supported encapsulation types for PTP.</p> <p>The remaining statements are explained separately. See <a href="#">CLI Explorer</a>.</p>
<b>Options</b>	<p><b>IPv4</b>—The encapsulation type for Precision Time Protocol packet transport as IPv4.</p> <p><b>IPv6</b>—The encapsulation type for Precision Time Protocol packet transport as IPv6.</p>
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring Precision Time Protocol on page 319</a></li><li>• <a href="#">Example: Configuring Precision Time Protocol on page 325</a></li><li>• <a href="#">Precision Time Protocol Overview on page 256</a></li></ul>



## transport (master)

<b>Syntax</b>	transport ipv4 ipv6;
<b>Hierarchy Level</b>	[edit protocols ptp <b>master</b> interface <i>interface-name</i> <b>unicast-mode</b> ]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.2.
<b>Description</b>	<p>Configure the encapsulation type for Precision Time Protocol packet transport. Both, IPv4 and IPv6 are the supported encapsulation types for PTP.</p> <p>The remaining statements are explained separately. See <a href="#">CLI Explorer</a>.</p>
<b>Options</b>	<p><b>IPv4</b>—The encapsulation type for Precision Time Protocol packet transport as IPv4.</p> <p><b>IPv6</b>—The encapsulation type for Precision Time Protocol packet transport as IPv6.</p>
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring Precision Time Protocol on page 319</a></li> <li>• <a href="#">Example: Configuring Precision Time Protocol on page 325</a></li> <li>• <a href="#">Precision Time Protocol Overview on page 256</a></li> </ul>

## transport-type

---

<b>Syntax</b>	<code>transport-type type;</code>
<b>Hierarchy Level</b>	<code>[edit services hosted-services server-profile <i>server-profile-name</i>]</code>
<b>Release Information</b>	Statement introduced in Junos OS Release 13.2.
<b>Description</b>	Configure the transport type.
<b>Options</b>	<i>type</i> —Transport type. <b>Range:</b> GRE, TCP, or UDP
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <i>Configuring Active Flow Monitoring on PTX Series Packet Transport Routers</i></li></ul>

## tunnel-services (Chassis)

**Syntax**

```
tunnel-services {
  bandwidth bandwidth-value;
  tunnel-only;
}
```

**Hierarchy Level** [edit chassis fpc slot-number pic number]

**Release Information** Statement introduced in Junos OS Release 8.2.  
Statement introduced in Junos OS Release 12.3X54 for ACX Series routers.

**Description** For MX Series 5G Universal Routing Platforms, configure the amount of bandwidth for tunnel services.

For ACX Series routers, configure the amount of bandwidth for tunnel services. Only bandwidths of 1 Gbps and 10 Gbps are supported for ACX routers.

For M7i, M10i, M120, M320, T Series and TX Matrix routers with IQ2 PICs and IQ2E PICs, configure support for per unit scheduling for GRE tunnels. You can specify the IQ2 and IQ2E PICs to work exclusively in tunnel mode or as a regular PIC. The default setting uses IQ2 and IQ2E PICs as a regular PIC. If you do not configure the **tunnel-only** option, the IQ2 and IQ2E PICs operate as regular PICs. For M7i, M10i, M120, M320, T Series and TX Matrix routers with IQ2 PICs and IQ2E PICs, you can use the **tunnel-only** option to specify that an IQ2 or IQ2E PIC work in tunnel mode only.



**NOTE:** Bandwidth rates of 20 gigabits per second and 40 gigabits per second require use of an MX Series router with the 100-Gigabit Ethernet Modular Port Concentrator (MPC) and the 100-Gigabit CFP MIC.



**NOTE:** On MX80 routers and MX Series routers with Trio-based FPCs, when ingress queuing is enabled for a PIC, tunnel services and inline services are not supported on the same PIC.

**Options** **tunnel-only** (Optional)—For M7i, M10i, M120, M320, T Series and TX Matrix routers with IQ2 PICs and IQ2E PICs, specify that an IQ2 or IQ2E PIC work in tunnel mode only.

The remaining statements are explained separately. Search for a statement in [CLI Explorer](#) or click a linked statement in the Syntax section for details.

**Required Privilege Level** interface—To view this statement in the configuration.  
interface-control—To add this statement to the configuration.

**Related Documentation**

- [Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC on page 575](#)
- [Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 576](#)
- [Example: Configuring Tunnel Interfaces on the MPC3E on page 64](#)
- [bandwidth \(Tunnel Services\) on page 606](#)

---

## tx-dnu-to-line-source-enable

---

**Syntax** tx-dnu-to-line-source-enable;

**Hierarchy Level** [edit chassis [synchronization](#) output interfaces external]  
[edit chassis [synchronization](#) output interfaces (external-0/0 | external-1/0)]

**Release Information** Statement introduced in Junos OS Release 12.3 for MX Series routers.


**Description** Configure the transmitting quality level to DNU or DUS on the line source interface that has been selected as the external output source.

**Required Privilege Level** interface—To view this statement in the configuration.  
interface-control—To add this statement to the configuration.

**Related Documentation**

- [synchronization on page 794](#)

## ucode-imem-remap

Syntax	ucode-imem-remap;
Hierarchy Level	[edit chassis feb slot <i>number</i> ]
Release Information	Statement introduced in Junos OS Release 10.4R2.
Description	<p>M120 routers with a single type-1 FPC mapped to an FEB support a microcode remap feature to resolve microcode overflow resulting in bad PIC combinations.</p> <p>You can enable the microcode remap by using the <b>ucode-imem-remap</b> statement at the [edit chassis feb slot <i>number</i>] hierarchy level. The default microcode map will continue to be available if the <b>ucode-imem-remap</b> statement is not configured.</p>
	<p> <b>NOTE:</b> On M120 routers, the FEB is automatically restarted once the <b>ucode-imem-remap</b> statement is configured and committed.</p>
Required Privilege Level	<p>interfaces—To view this statement in the configuration.</p> <p>interfaces-control—To add this statement to the configuration.</p>

## unicast-mode (master)

---


Syntax	<pre>unicast-mode {   transport ipv4;   clock-client <i>ip-address</i> {     local-ip-address <i>local-ip-address</i>;   }   transport ipv6;   clock-ipv6-client <i>slave-ip-address</i> {     local-ip-address <i>local-ip-address</i>;   } }</pre>
Hierarchy Level	[edit protocols ptp <b>master</b> interface <i>interface-name</i> ]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	<p>Configure the master in unicast mode. You can set this option when PTP unicast mode of messaging is needed.</p> <p>The remaining statements are explained separately. See <a href="#">CLI Explorer</a>.</p>
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"><li>• <a href="#">Configuring Precision Time Protocol on page 319</a></li><li>• <a href="#">Example: Configuring Precision Time Protocol on page 325</a></li><li>• <a href="#">Precision Time Protocol Overview on page 256</a></li></ul>

## unicast-mode (slave)

<b>Syntax</b>	<pre> unicast-mode {   clock-source ip-address {     local-ip-address local-ip-address;     asymmetry number;   }   transport ipv4;   clock-ipv6-source (slave) master-ipv6-address {     local-ip-address local-ip-address;   }   transport ipv6; } </pre>
<b>Hierarchy Level</b>	[edit protocols ptp <b>slave</b> interface <i>interface-name</i> ]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.2.
<b>Description</b>	<p>Configure the slave in unicast mode. You can set this option when PTP unicast mode of messaging is needed.</p> <p>The remaining statements are explained separately. See <a href="#">CLI Explorer</a>.</p>
<b>Required Privilege Level</b>	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Configuring Precision Time Protocol on page 319</a></li> <li>• <a href="#">Example: Configuring Precision Time Protocol on page 325</a></li> <li>• <a href="#">Precision Time Protocol Overview on page 256</a></li> <li>• <i>IEEE 1588v2 Precision Timing Protocol (PTP)</i></li> </ul>

## unicast-negotiation

---

<b>Syntax</b>	unicast-negotiation;
<b>Hierarchy Level</b>	[edit protocols ptp]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.2. Statement introduced in Junos OS Release 17.3 for the QFX Series.
<b>Description</b>	Configure unicast negotiation. Unicast negotiation is a method by which the announce, synchronization, and delay response packet rates are negotiated between the master and the slave before a PTP session is established.  ..... <div> <b>NOTE:</b> When unicast negotiation is enabled, you cannot commit any packet rate-related configuration.</div> .....
<b>Required Privilege Level</b>	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring Precision Time Protocol on page 319</a></li><li>• <a href="#">Example: Configuring Precision Time Protocol on page 325</a></li><li>• <a href="#">Precision Time Protocol Overview on page 256</a></li><li>• <a href="#">IEEE 1588v2 Precision Timing Protocol (PTP)</a></li></ul>



## upgrade-mode

<b>Syntax</b>	<code>upgrade-mode (3d-fabric   default   t4000);</code>
<b>Hierarchy Level</b>	<code>[edit chassis fabric],</code> <code>[edit chassis member <i>name</i> fabric]</code>
<b>Release Information</b>	Statement introduced in Junos OS Release 7.5. Statement introduced in Junos OS Release 15.1F3 for PTX Series Routers with third-generation FPCs.
<b>Description</b>	Configures upgrade mode for SIBs and forces them to operate in the same mode until the upgrade is complete. Upgrade mode is used so that two different types of SIBs can be installed in an operational router or routing matrix. After you upgrade the SIBs delete the <b>upgrade-mode</b> statement from the configuration. See the hardware installation guide for your router for more information about upgrading SIBs in an operational router or routing matrix.
<b>Options</b>	<p><b>3d-fabric</b>—Enables the TX Matrix Plus router to upgrade to a TX Matrix Plus router with 3D SIBs. On the SFC, enables setting proper support for mixed SIBs (TXP-F13 SIB and TXP-F13-3D SIB). On the T640 or T1600 or T4000 routers in a routing matrix enables support for mixed SIBs (TXP-T1600 SIB and TXP-3D-LCC SIBs on the T1600 router and SIB-I-T4000 and TXP-3D-LCC SIBs on the T4000 router).</p> <p><b>default</b>—Enables support for mixed SIBs when upgrading SIBs in the PTX3000 and PTX5000 routers.</p> <p><b>t4000</b>—Enables support for mixed SIBs when upgrading to SIB-I-T4000 SIBs in a T640 or T1600.</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">TX Matrix Router and T640 Router Configuration Overview on page 373</a></li> <li>• <a href="#">Configuring Junos OS to Upgrade a T4000 Router to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 419</a></li> <li>• <a href="#">Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 412</a></li> <li>• <a href="#">Upgrading an Operational Standalone Router and Integrating It into a TX Matrix Plus Routing Matrix with 3D SIBs</a></li> <li>• <a href="#">Upgrading to SIB3-SFF-PTX SIBs in an Operational PTX3000</a></li> <li>• <a href="#">Upgrading the FPCs in an Operational PTX5000</a></li> </ul>

## vpn-label

---


<b>Syntax</b>	vpn-label;
<b>Hierarchy Level</b>	[edit chassis <a href="#">memory-enhanced</a> ]
<b>Release Information</b>	Statement added in Junos OS Release 10.4.
<b>Description</b>	Allocate more jtree memory for Layer 3 VPN labels.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels on page 506</a></li></ul>

## vrf-mtu-check


---

<b>Syntax</b>	vrf-mtu-check;
<b>Hierarchy Level</b>	[edit chassis]
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 11.1 for EX Series switches.
<b>Description</b>	On M Series routers (except the M120 and M320 router) and on EX Series 8200 switches, configure path maximum transmission unit (MTU) checks on the outgoing interface for unicast traffic routed on a virtual private network (VPN) routing and forwarding (VRF) instance.
<b>Default</b>	Disabled.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring Path MTU Checks for VPN Routing Instances</a></li><li>• <a href="#">Configuring the Junos OS to Enable MTU Path Check for a Routing Instance on M Series Routers on page 429</a></li></ul>

## vtmapping

<b>Syntax</b>	<code>vtmapping (itu-t   klm);</code>
<b>Hierarchy Level</b>	<code>[edit chassis fpc <i>number</i> pic <i>number</i>],</code> <code>[edit interfaces <i>interface-name</i> sonet-options]</code>
<b>Release Information</b>	Statement introduced before Junos OS Release 7.4.
<b>Description</b>	<p>For the Channelized STM1 IQ PIC or Channelized STM1 PIC, configure virtual tributary mapping.</p> <p>For the Channelized STM1 PIC, you configure virtual tributary mapping at the <code>[edit chassis fpc <i>number</i> pic <i>number</i>]</code> hierarchy level.</p>
	<div>  <p><b>NOTE:</b> The <code>vtmapping</code> statement is not supported for <code>cau4</code> interfaces on the Channelized OC3/STM1 (Multi-Rate) Circuit Emulation MIC with SFP (H).</p> </div>
<b>Options</b>	<p><code>itu-t</code>—International Telephony Union standard.</p> <p><code>klm</code>—KLM standard.</p> <p><b>Default:</b> <code>klm</code></p>
<b>Required Privilege Level</b>	<p><code>interface</code>—To view this statement in the configuration.</p> <p><code>interface-control</code>—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><a href="#">Configuring Virtual Tributary Mapping of Channelized STM1 Interfaces</a></li> <li><a href="#">Configuring the Junos OS to Support Channelized STM1 Interface Virtual Tributary Mapping on page 497</a></li> </ul>

## wait-to-restore

<b>Syntax</b>	<code>wait-to-restore <i>minutes</i>;</code>
<b>Hierarchy Level</b>	<code>[edit chassis source interfaces (external-a   external-b   interface <i>interface-name</i>)]</code> <code>[edit chassis source interfaces (external   interface <i>interface-name</i>)]</code> <code>[edit chassis source interfaces (external-0/0   external-1/0   interface <i>interface-name</i>)]</code>
<b>Release Information</b>	Statement introduced in Junos OS Release 14.2 for MX Series routers.
<b>Description</b>	<p>Configure the time in minutes for each port to be up before opening the Ethernet Synchronization Message Channel (ESMC) for messages. When a port's signal transitions out of the signal fail state, it must be fault-free for the wait-to-restore time before it is again considered by the clock selection process.</p> <p> <b>NOTE:</b> When you perform GRES on MX Series routers, you must execute the <code>clear synchronous-ethernet wait-to-restore</code> operational mode command on the new master Routing Engine to clear the wait-to-restore timer on it. This is because the <code>clear synchronous-ethernet wait-to-restore</code> operational mode command clears the wait-to-restore timer only on the local Routing Engine.</p>
<b>Options</b>	<p><b><i>minutes</i></b>—Set the time for the port signal to be up before the port is opened to receive and transmit ESMC messages.</p> <p><b>Range:</b> 0 through 12 minutes</p> <p><b>Default:</b> 5 minutes</p>
<b>Required Privilege Level</b>	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">synchronization (MX Series) on page 794</a></li> <li>• <a href="#">synchronization (PTX Series) on page 802</a></li> <li>• <a href="#">global-wait-to-restore on page 671</a></li> </ul>

## wander-filter-disable

---

<b>Syntax</b>	wander-filter-disable;
<b>Hierarchy Level</b>	[edit chassis <a href="#">synchronization</a> output interfaces external] [edit chassis <a href="#">synchronization</a> output interfaces (external-0/0   external-1/0)]
<b>Release Information</b>	Statement introduced in Junos OS Release 12.3 for MX Series routers.
<b>Description</b>	Disable the wander filter on the output interface.
<b>Required Privilege Level</b>	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">synchronization on page 794</a></li></ul>



## CHAPTER 27

# Administrative Commands

- clear chassis alarms fabric degraded
- clear chassis display message
- clear chassis fpc errors
- clear synchronous-ethernet esmc statistics
- clear synchronous-ethernet wait-to-restore
- request chassis afeb
- request chassis cb
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- request chassis fabric guided-cabling disable
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- request chassis redundancy feb slot
- request chassis routing-engine master
- request chassis scg

- request chassis sfb
- request chassis sfm master switch
- request chassis sfm
- request chassis sib
- request chassis sib f13 train-link-receive slot
- request chassis sib f13 train-link-transmit slot
- request chassis sib optics lcc
- request chassis sib optics sfc
- request chassis sib train-link-receive slot
- request chassis sib train-link-transmit slot
- request chassis spmb restart
- request chassis synchronization mode
- request chassis synchronization switch
- set chassis display message



## clear chassis alarms fabric degraded

<b>Syntax (TX Matrix Plus Router with 3D SIBs)</b>	<code>clear chassis alarms fabric degraded lcc <i>number</i> fpc <i>number</i></code>
<b>Release Information</b>	Command introduced in Junos OS Release 13.2 for a routing matrix with a TX Matrix Plus routers and 3D SIBs.
<b>Description</b>	Clear the fabric degraded alarm for an FPC.
<b>Options</b>	<p><b>lcc <i>number</i></b>—Line-card chassis number.</p> <p>Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> <li>0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> <li>0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> </ul> <p><b>fpc <i>number</i></b>—Flexible PIC Concentrator (FPC) slot number. On a TX Matrix Plus router in the TXP-T1600-3D, TXP-T4000-3D, or TXP-Mixed-LCC-3D configuration, specify the number of a T1600 or T4000 router by using the <b>lcc <i>number</i></b> option and replace <b>fpc <i>number</i></b> with a value from 0 through 7.</p>
<b>Required Privilege Level</b>	clear
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><code>show system alarms</code></li> </ul>

## Sample Output

### show system alarms (TX Matrix Plus router with 3D SIBs)

```

user@host> show system alarms

sfc0-re0:
-----
2 alarms currently active
Alarm time           Class  Description
2013-05-08 18:13:58 UTC Major  LCC 0 Major Errors
2013-05-08 17:48:46 UTC Major  LCC 7 Major Errors

lcc0-re1:
-----
3 alarms currently active
Alarm time           Class  Description
2013-05-08 17:35:34 UTC Minor  SIB 3 Not Online
2013-05-08 17:35:34 UTC Minor  SIB 2 Not Online

```

```
2013-05-08 18:19:24 UTC Major FPC 5 degraded fabric condition detected
```

```
user@host> clear chassis alarms fabric degraded lcc 0 fpc 5
```

```
lcc0-re1:
```

```
user@host> show system alarms
```

```
sfc0-re0:
```

```
-----  
2 alarms currently active
```

Alarm time	Class	Description
2013-05-08 18:13:58 UTC	Major	LCC 0 Major Errors
2013-05-08 17:48:46 UTC	Major	LCC 7 Major Errors

```
lcc0-re1:
```

```
-----  
2 alarm currently active
```

Alarm time	Class	Description
2013-05-08 17:36:34 UTC	Minor	SIB 3 Not Online
2013-05-08 17:36:34 UTC	Minor	SIB 2 Not Online

## clear chassis display message

<b>List of Syntax</b>	<a href="#">Syntax on page 833</a> <a href="#">Syntax (TX Matrix Router) on page 833</a> <a href="#">Syntax (TX Matrix Plus Router) on page 833</a> <a href="#">Syntax (QFabric Systems) on page 833</a>
<b>Syntax</b>	clear chassis display message
<b>Syntax (TX Matrix Router)</b>	clear chassis display message <lcc <i>number</i>   scc>
<b>Syntax (TX Matrix Plus Router)</b>	clear chassis display message <lcc <i>number</i>   sfc <i>number</i> >
<b>Syntax (QFabric Systems)</b>	clear chassis display message <node-device <i>name</i>   interconnect-device <i>name</i> >
<b>Release Information</b>	<p>Command introduced in Junos OS Release 7.5.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p><b>sfc</b> option for the TX Matrix Plus routers introduced in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
<b>Description</b>	<p>(M40e, M160, M320, T Series routers, EX Series, and QFabric systems only) Clear or stop a text message on the craft interface display, which is on the front of the router or switch or on the LCD panel display on the router or switch. The craft interface alternates the display of text messages with standard craft interface messages, switching between messages every 2 seconds. By default, on both the router and the switch, the text message is displayed for 5 minutes. The craft interface display has four 20-character lines. The LCD panel display has two 16-character lines, and text messages appear only on the second line.</p>
<b>Options</b>	<p><b>none</b>—Clear or stop a text message on the craft interface display.</p> <p><b>interconnect-device <i>name</i></b>—(QFabric systems only) (Optional) On a QFabric system, clear or stop a text message on the LCD panel display on the specified Interconnect device.</p> <p><b>lcc <i>number</i></b>—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.</p>

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**node-device *name***—(QFabric systems only) (Optional) On a QFabric system, clear or stop a text message on the LCD panel display on the specified Node device in a Node group.

**scc**—(TX Matrix routers only) (Optional) Clear or stop a text message on the craft interface on the TX Matrix router (switch-card chassis).

**sfc *number***—(TX Matrix Plus routers only) (Optional) Clear or stop a text message on the craft interface on the TX Matrix Plus router (or switch-fabric chassis). Replace *number* with 0.

**Required Privilege Level** clear

**Related Documentation**

- [Configuring the LCD Panel on EX Series Switches \(CLI Procedure\)](#)
- [set chassis display message on page 914](#)
- [show chassis craft-interface on page 950](#)

**List of Sample Output** [clear chassis display message on page 834](#)

**Output Fields** See [show chassis craft-interface](#) for an explanation of output fields.

## Sample Output

### clear chassis display message

The following example displays and then clears the text message on the craft interface display:

```
user@host> show chassis craft-interface
Red alarm:      LED off, relay off
Yellow alarm:   LED off, relay off
Host OK LED:    On
Host fail LED:  Off
FPCs           0  1  2  3  4  5  6  7
```

```
-----
Green .. *.. * *.

```

```
Red .....
```

```
LCD screen:
```

```
+-----+
|NOC contact Dusty |
|(888) 526-1234    |
+-----+
```

```
user@host> clear chassis display message
```

```
user@host> show chassis craft-interface
```

```
Red alarm:      LED off, relay off
```

```
Yellow alarm:   LED off, relay off
```

```
Host OK LED:    On
```

```
Host fail LED:  Off
```

```
FPCs    0  1  2  3  4  5  6  7
```

```
-----
Green .. *.. * *.

```

```
Red .....
```

```
LCD screen:
```

```
+-----+
|host      |
|Up: 0+17:05:47|
|          |
|Temperature OK|
+-----+
```

## clear chassis fpc errors

---

Syntax	<code>clear chassis fpc errors fpc-slot <i>fpc-slot</i> (all   error-id <i>error-id</i>)</code>
Release Information	Command introduced in Junos OS Release 18.2R1.
Description	Clear the chassis FPC errors. You can choose to clear a particular error or all errors on the FPC.
Options	<b>fpc-slot <i>fpc-slot</i></b> —The slot number of the FPC in which you want to run this command. <b>all</b> —Clear all the errors on the FPC. <b>error-id <i>error-id</i></b> —Clear a particular error identified by an error-id. An <i>error-id</i> , a unique error identifier, is represented as a Uniform Resource Identifier (URI). For example, <b>"/cpu/0/memory/0/memory-uncorrected-error"</b> is an error-id that indicates an uncorrectable error under CPU memory module instance 0.
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none"><li>• <a href="#">fpc error on page 659</a></li></ul>
List of Sample Output	<a href="#">clear chassis fpc errors on page 836</a>
Output Fields	When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### clear chassis fpc errors

```
user@host> clear chassis fpc errors fpc-slot 1 all
```

```
Clearing error(s) on fpc 1, option all
```

---

## clear synchronous-ethernet esmc statistics

---

Syntax	<code>clear synchronous-ethernet esmc statistics &lt;interface-name&gt;</code>
Release Information	Command introduced before Junos OS Release 10.4.
Description	Clear the ESMC statistics for all the interfaces.
Options	<i>interface-name</i> —(Optional) Clear ESMC statistics for the specified interface.
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none"><li>• <a href="#">Example: Configuring Synchronous Ethernet on MX Series Routers on page 311</a></li><li>• <a href="#">Synchronous Ethernet Overview on page 242</a></li><li>• <a href="#">show synchronous-ethernet esmc statistics on page 2276</a></li></ul>
List of Sample Output	<a href="#">clear synchronous-ethernet esmc statistics on page 837</a>

### Sample Output

#### clear synchronous-ethernet esmc statistics

The following example displays the message after the **clear synchronous-ethernet esmc statistics** command is entered:

```
user@host> clear synchronous-ethernet esmc statistics
Cleared ESMC statistics for all interfaces
```

## clear synchronous-ethernet wait-to-restore

**Syntax** `clear synchronous-ethernet wait-to-restore  
<interface interface-name>`

**Release Information** Command introduced in Junos OS Release 14.2.

**Description** Clear the wait-to-restore timer for all the interfaces in an MX Series router.



**NOTE:** When you perform GRES on MX Series routers, you must execute the `clear synchronous-ethernet wait-to-restore` operational mode command on the new master Routing Engine to clear the wait-to-restore timer on it. This is because the `clear synchronous-ethernet wait-to-restore` operational mode command clears the wait-to-restore timer only on the local Routing Engine.

**Options** `interface interface-name`—(Optional) Clear wait to restore timer for the specified interface.

**Required Privilege Level** clear

**Related Documentation**

- [Example: Configuring Synchronous Ethernet on MX Series Routers on page 311](#)
- [Synchronous Ethernet Overview on page 242](#)

**List of Sample Output** [clear synchronous-ethernet wait-to-restore interface <interface-name> on page 838](#)

### Sample Output

`clear synchronous-ethernet wait-to-restore interface <interface-name>`

The following example displays the message after the `clear synchronous-ethernet wait-to-restore interface ge-2/1/6` command is entered in operational mode command:

```
user@host> clear synchronous-ethernet wait-to-restore interface ge-2/1/6
Cleared wait-to-restore timer for interface ge-2/1/6
```



## request chassis afeb

<b>Syntax</b>	request chassis afeb (offline   online   restart)
<b>Release Information</b>	Command introduced in Junos OS Release 13.2.
<b>Description</b>	Control the operation of the compact Forwarding Engine Board (FEB).
<b>Options</b>	<b>offline</b> —Take the FEB offline. <b>online</b> —Bring the FEB online. <b>restart</b> —Restart the FEB.
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">show chassis afeb on page 923</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">request chassis afeb online (MX104 Router) on page 839</a>
<b>Output Fields</b>	When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### request chassis afeb online (MX104 Router)

```
user@host> request chassis afeb online
AFEB is already online
```

## request chassis cb

<b>List of Syntax</b>	<a href="#">Syntax on page 840</a> <a href="#">Syntax (TX Matrix Router) on page 840</a> <a href="#">Syntax (TX Matrix Plus Router) on page 840</a> <a href="#">Syntax (QFabric System) on page 840</a> <a href="#">Syntax (EX9253 Switches) on page 840</a>
<b>Syntax</b>	<code>request chassis cb (offline   online) slot <i>slot-number</i></code>
<b>Syntax (TX Matrix Router)</b>	<code>request chassis cb (offline   online) &lt;slot <i>slot-number</i>   lcc <i>number</i> slot <i>cb-slot-number</i>   scc <i>number</i> slot <i>cb-slot-number</i>&gt;</code>
<b>Syntax (TX Matrix Plus Router)</b>	<code>request chassis cb (offline   online) &lt;slot <i>slot-number</i>   lcc <i>number</i> slot <i>cb-slot-number</i>   sfc <i>number</i> slot <i>cb-slot-number</i>&gt;</code>
<b>Syntax (QFabric System)</b>	<code>request chassis cb (offline   online) interconnect-device <i>name</i> slot <i>slot-number</i></code> <code>&lt;interconnect-device <i>name</i> slot <i>slot-number</i> (offline   online)&gt;</code>
<b>Syntax (EX9253 Switches)</b>	<code>request chassis cb (offline   online) <i>name</i> slot <i>slot-number</i></code>
<b>Release Information</b>	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS 9.4 for EX Series switches.</p> <p>sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS 11.3 for QFX Series.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 18.2 for EX9253 Series Switches.</p>
<b>Description</b>	(M120, M320, and MX Series routers and T Series routers, QFabric systems, and EX8200 switches only) Control the operation of the Control Board (CB).
<b>Options</b>	<b>offline</b> —Take the Control Board offline.



**NOTE:** On a QFabric system, to bring the backup Control Board on a QFX3008-I Interconnect device offline, issue the `request chassis cb slot backup-slot-number offline` command.



**NOTE:** Only backup Control Board can be turned offline or online. To turn a Control Board offline or to bring it back online, the Routing Engine should be turned offline first.

**online**—Bring the Control Board online.

**interconnect-device *name***—(QFabric systems only) (Optional) Bring the QFX3008-I Interconnect device Control Board either offline or online:

**slot *slot-number***—Control Board slot number:

- (TX Matrix and TX Matrix Plus routers only) On a TX Matrix router, if you specify the number of the T640 router by using the *lcc number* option (the recommended method), replace *cb-slot-number* with a value from 0 through 1.  
  
Likewise, on a TX Matrix Plus router, if you specify the number of the T1600 or T4000 router by using the *lcc number* option (the recommended method), replace *cb-slot-number* with a value from 0 through 1.
- M320 router—Replace *slot-number* with a value from 0 through 1.
- MX480/MX240 routers—Replace *slot-number* with a value from 0 through 1.
- MX960 router—Replace *slot-number* with a value from 0 through 2.
- MX2020, MX2010, and MX2008 routers—Replace *slot-number* with 0 or 1.
- EX8208 switch—Replace *slot-number* with a value from 0 through 2.
- EX8216 switch—Replace *slot-number* with a value from 0 through 1.
- QFabric System—Replace *slot-number* with a value from 0 through 1.

**lcc *number***—(TX Matrix, TX Matrix Plus routers only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**sfc *number***—(TX Matrix Plus routers only) (Optional) Change the CB status for the TX Matrix Plus router (switch-fabric chassis). Replace *number* with 0.

**Required Privilege Level** maintenance

**Related Documentation**

- [show chassis environment cb on page 1066](#)
- *Understanding Switching Control Board Redundancy*

**List of Sample Output**

- [request chassis cb on page 842](#)
- [request chassis cb interconnect-device \(QFabric System\) on page 842](#)
- [request chassis cb \(MX2020 Router\) on page 842](#)
- [request chassis cb \(MX2010 Router\) on page 842](#)
- [request chassis cb \(MX2008 Router\) on page 842](#)
- [request chassis cb \(MX10003 Router\) on page 842](#)
- [request chassis cb \(EX9253 Switch\) on page 843](#)

**Output Fields** When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### [request chassis cb](#)

```
user@host> request chassis cb offline slot 1
Backup CB 1 cannot be set offline, backup RE is online
```

### [request chassis cb interconnect-device \(QFabric System\)](#)

```
user@switch> request chassis cb interconnect-device interconnect1 offline slot 1
Backup CB 1 cannot be set offline, backup RE is online
```

### [request chassis cb \(MX2020 Router\)](#)

```
user@host> request chassis cb offline slot 1
Backup CB 1 cannot be set offline, backup RE is online
```

### [request chassis cb \(MX2010 Router\)](#)

```
user@host> request chassis cb offline slot 1
Backup CB 1 cannot be set offline, backup RE is online
```

### [request chassis cb \(MX2008 Router\)](#)

```
user@host> request chassis cb offline slot 1
Backup CB 1 cannot be set offline, backup RE is online
```

### [request chassis cb \(MX10003 Router\)](#)

```
user@host> request chassis cb online slot 1
CB 1 appears to be online already
```

### request chassis cb (EX9253 Switch)

```
user@switch>request chassis cb offline slot 1
```

```
Offline initiated, use "show chassis environment cb" to verify
```

## request chassis ccg

---

<b>Syntax</b>	<code>request chassis ccg (offline   online) slot <i>slot-number</i></code>
<b>Release Information</b>	Command introduced in Junos OS 12.1x48 for the PTX5000 Packet Transport Routers.
<b>Description</b>	(PTX5000 Packet Transport Routers) Control the operation of the Centralized Clock Generator (CCG).
<b>Options</b>	<b>offline</b> —Take the CCG offline. <b>online</b> —Bring the CCG online. <b>slot <i>slot-number</i></b> —CCG slot number. Replace <i>slot-number</i> with a value from 0 through 1.
<b>Required Privilege Level</b>	maintenance
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Clock Sources for PTX Series Packet Transport Routers on page 306</a></li><li>• <a href="#">show chassis environment ccg on page 1093</a></li></ul>
<b>List of Sample Output</b>	<a href="#">request chassis ccg on page 844</a>
<b>Output Fields</b>	When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### request chassis ccg

```
user@host> request chassis ccg offline slot 1
CCG 1 is  offline, Backup CCG 0 is now online.
```

## request chassis cfep

<b>Syntax</b>	<code>request chassis cfep (offline   online   restart)</code>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	(M7i and M10i routers only) Control the operation of the Compact Forwarding Engine Board (CFEB).
<b>Options</b>	<p><b>offline</b>—Take the CFEB offline.</p> <p><b>online</b>—Bring the CFEB online.</p> <p><b>restart</b>—Restart the CFEB.</p>
<b>Required Privilege Level</b>	maintenance
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">show chassis cfep on page 945</a></li> <li>• <i>Configuring CFEB Redundancy on the M10i Router</i></li> <li>• <i>CFEB Overview</i></li> </ul>
<b>List of Sample Output</b>	<a href="#">request chassis cfep on page 845</a>
<b>Output Fields</b>	When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### request chassis cfep

```
user@host> request chassis cfep offline
CFEB Offlined
```

## request chassis cip

---

Syntax	<code>request chassis cip (offline   online) slot <i>slot-number</i></code>
Release Information	Command introduced for the TX Matrix Plus router in Junos OS Release 9.6.
Description	(TX Matrix Plus routers only) Control the operation of the Connector Interface Panel (CIP).
Options	<b>offline</b> —Take the CIP offline. <b>online</b> —Bring the CIP online. <b>slot <i>slot-number</i></b> —CIP slot number. Replace <i>slot-number</i> with a value ranging from 0 through 1.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"><li>• <a href="#">show chassis cip on page 947</a></li><li>• <i>Installing a T1600 CIP</i></li><li>• <i>Installing a T640 CIP</i></li><li>• <i>Installing a TX-CIP</i></li><li>• <i>Installing an M320 CIP</i></li><li>• <i>Installing the M40e CIP</i></li><li>• <i>Installing the T320 CIP</i></li><li>• <i>CIP Overview</i></li></ul>
List of Sample Output	<a href="#">request chassis cip offline slot (TX Matrix Plus Router) on page 846</a> <a href="#">request chassis cip offline slot (TX Matrix Plus Router) on page 846</a>
Output Fields	When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### request chassis cip offline slot (TX Matrix Plus Router)

```
user@host > request chassis cip offline slot 0
CIP 0 offline done
```

### request chassis cip offline slot (TX Matrix Plus Router)

```
user@host > request chassis cip online slot 0
```



CIP 0 online done

## request chassis clock master switch

---

<b>Syntax</b>	request chassis clock master switch
<b>Release Information</b>	Command introduced in Junos OS Release 12.1.
<b>Description</b>	(PTX Series Packet Transport Routers only) Control which Centralized Clock Generator (CCG) is the master.
<b>Options</b>	This command has no options.
<b>Additional Information</b>	<p>By default, the CCG in slot 0 (CCG0) is the master and the CCG in slot 1 (CCG1) is the backup. If you use this command to change the master, and then restart the chassis software for any reason, the master reverts to the default setting. To change the default master CCG, include the <b>ccg</b> statement at the <b>[edit chassis redundancy]</b> hierarchy level in the configuration. For more information, see the <i>Junos OS Administration Library</i>.</p> <p>The configurations on the two CCGs do not have to be the same, and they are not automatically synchronized. If you configure both CCGs as masters, when the chassis software restarts for any reason, the CCG in slot 0 becomes the master and the one in slot 1 becomes the backup.</p> <p>The switchover from the primary CCG to the backup CCG is immediate.</p>
<b>Required Privilege Level</b>	maintenance
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">show chassis environment on page 969</a></li></ul>
<b>List of Sample Output</b>	<a href="#">request chassis clock master switch on page 848</a>
<b>Output Fields</b>	When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### request chassis clock master switch

```
user@host> request chassis clock master switch
CCG master switch initiated, use "show chassis environment ccg" to verify
```

## request chassis fabric guided-cabling disable

<b>Syntax</b>	<code>request chassis fabric guided-cabling disable (all-lcc   lcc <i>lcc-number</i>)</code>
<b>Release Information</b>	Command introduced in Junos OS Release 14.1 for TX Matrix Plus routers with 3D SIBs.
<b>Description</b>	Disable the guided cabling operation.
<b>Options</b>	<p><b>all-lcc</b>—Disable the guided cabling operation for all the LCCs.</p> <p><b>lcc <i>lcc-number</i></b>—Disable the guided cabling operation for the specified LCC.</p>
<b>Required Privilege Level</b>	admin
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">request chassis fabric guided-cabling enable on page 850</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">request chassis fabric guided-cabling disable all-lcc on page 849</a> <a href="#">request chassis fabric guided-cabling disable lcc 7 on page 849</a>
<b>Output Fields</b>	When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### request chassis fabric guided-cabling disable all-lcc

```
user@host> request chassis fabric guided-cabling disable all-lcc
Guided Cabling disable initiated
```

### request chassis fabric guided-cabling disable lcc 7

```
user@host> request chassis fabric guided-cabling disable lcc 7
Guided Cabling disable initiated
```

## request chassis fabric guided-cabling enable

<b>Syntax</b>	<code>request chassis fabric guided-cabling enable (plane-by-plane   port-by-port) (all-lcc   lcc <i>lcc-number</i>)</code>
<b>Release Information</b>	Command introduced in Junos OS Release 14.1 for TX Matrix Plus routers with 3D SIBs.
<b>Description</b>	Enable the guided cabling operation by using blinking LEDs on the ports to be connected on the LCC and the SFC.
<b>Options</b>	<p><b>plane-by-plane</b>—Enable blinking of <b>CBL</b> LEDs for all the unconnected ports on a TXP-F13-3D SIB and a TXP-LCC-3D SIB for a particular fabric plane. After you connect all the cables on a TXP-F13-3D SIB and a TXP-LCC-3D SIB, all <b>CBL</b> LEDs blink on the fabric plane that need to be subsequently connected. The operation continues until all the cables are connected for all available fabric planes.</p> <p><b>port-by-port</b>—Enable blinking of the <b>CBL</b> LED for an unconnected port on a TXP-F13-3D SIB and a TXP-LCC-3D SIB. After you connect the cable to a port on a TXP-F13-3D SIB and a TXP-LCC-3D SIB, the <b>CBL</b> LED blinks on the next unconnected port on a TXP-F13-3D SIB and a TXP-LCC-3D SIB.</p> <p><b>all-lcc</b>—Enable the guided cabling operation for all the LCCs.</p> <p><b>lcc <i>lcc-number</i></b>—Enable the guided cabling operation for the specified LCC.</p>
<b>Required Privilege Level</b>	admin
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><a href="#">request chassis fabric guided-cabling disable on page 849</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">request chassis fabric guided-cabling enable plane-by-plane all-lcc on page 850</a> <a href="#">request chassis fabric guided-cabling enable port-by-port all-lcc on page 851</a> <a href="#">request chassis fabric guided-cabling enable plane-by-plane lcc 7 on page 851</a> <a href="#">request chassis fabric guided-cabling enable port-by-port lcc 7 on page 851</a>
<b>Output Fields</b>	When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### request chassis fabric guided-cabling enable plane-by-plane all-lcc

```
user@host> request chassis fabric guided-cabling enable plane-by-plane all-lcc
Guided Cabling enable initiated
```

**request chassis fabric guided-cabling enable port-by-port all-lcc**

```
user@host> request chassis fabric guided-cabling enable port-by-port all-lcc
Guided Cabling enable initiated
```

**request chassis fabric guided-cabling enable plane-by-plane lcc 7**

```
user@host> request chassis fabric guided-cabling enable plane-by-plane lcc 7
Guided Cabling enable initiated
```

**request chassis fabric guided-cabling enable port-by-port lcc 7**

```
user@host> request chassis fabric guided-cabling enable port-by-port lcc 7
Guided Cabling enable initiated
```

## request chassis fabric plane

---

**List of Syntax**   [Syntax on page 852](#)  
[Syntax \(EX9253 Switches\) on page 852](#)

**Syntax**   `request chassis fabric plane plane-number (offline | online)`

**Syntax (EX9253 Switches)**   `request chassis fabric plane plane-number (offline | online)`

**Release Information**   Command introduced in Junos OS Release 8.0.  
Command introduced in Junos OS Release 9.4 for EX Series switches.  
Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.  
Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.  
Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.  
Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.  
Command introduced in Junos OS Release 18.2 for EX9253 Switches.

**Description**   (M120 and MX Series routers and EX8200 switches only) Control the operation of the specified fabric plane.

On an MX480 or MX240 series router, you can configure the active control board for redundancy mode or increased bandwidth mode. When running in increased bandwidth mode, MX series routers with Trio chips and the MPC3E will use all eight active fabric planes.

To take both plane 0 and plane 1 offline on a MX480 and MX240 series routers with one or more MPC4E MICs installed, a X86 Media Service Blade, and/or 100G PFE, and where redundancy-mode is configured for "increased-bandwidth", Juniper recommends taking plane 1 offline before plane 0. Likewise, when the router is configured for increased-bandwidth mode, taking fabric planes 0, 2, 4, and 6 offline can cause the chassis to run in a reduced fabric bandwidth mode. Plane 7 may remain in a "spare" state (as seen in the "show chassis fabric summary" command output) until plane 3 is taken offline and then brought back up.

**Options**   **offline**—Take the fabric plane offline. Use the **request chassis fabric plane *plane-number* offline** command to clear a FAULT state on a fabric plane. To bring the fabric plane back online, use the **request chassis fabric plane *plane-number* online** command.

**online**—Bring the fabric plane online.

**plane *plane-number***—Fabric plane number.

- For the M120 router, replace *plane-number* with a value from 0 through 3.
- For the MX480 and MX240 routers, replace *plane-number* with a value from 0 through 7.

- For the MX2020, MX2010, and MX2008 routers, replace *plane-number* with a value from 0 through 7.
- For the MX960 router, replace *plane-number* with a value from 0 through 5.
- For the EX8208 switch, replace *plane-number* with a value from 0 through 11.
- For the EX8216 switch, replace *plane-number* with a value from 0 through 7.

**Required Privilege Level** maintenance

**Related Documentation**

- [show chassis fabric plane on page 1487](#)
- [show chassis fabric plane-location on page 1542](#)
- [show chassis fabric summary on page 1576](#)

**List of Sample Output**

- [request chassis fabric plane 0 online on page 853](#)
- [request chassis fabric plane 0 offline on page 853](#)
- [request chassis fabric plane 0 online \(EX8200 switch\) on page 853](#)
- [request chassis fabric plane \(MX2020 Router\) on page 854](#)
- [request chassis fabric plane \(MX2010 Router\) on page 854](#)
- [request chassis fabric plane \(MX2008 Router\) on page 854](#)
- [request chassis fabric plane \(MX10003 Router\) on page 854](#)
- [request chassis fabric plane \(EX9253 Switch\) on page 854](#)

**Output Fields** When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### request chassis fabric plane 0 online

```
user@host> request chassis fabric plane 0 online
Online initiated, use "show chassis fabric plane" to verify
```

### request chassis fabric plane 0 offline

```
user@host> request chassis fabric plane 0 offline
Offline initiated, use "show chassis fabric plane" to verify
```

### request chassis fabric plane 0 online (EX8200 switch)

```
user@host> request chassis fabric plane 0 online
Plane 0 is already active
```

#### request chassis fabric plane (MX2020 Router)

```
user@host> request chassis fabric plane 2 online  
Plane 2 is already active
```

#### request chassis fabric plane (MX2010 Router)

```
user@host> request chassis fabric plane 4 online  
Plane 4 is already active
```

#### request chassis fabric plane (MX2008 Router)

```
user@host>request chassis fabric plane 4 online  
Plane 4 is already active
```

#### request chassis fabric plane (MX10003 Router)

```
user@host>request chassis fabric plane 4 online  
Plane 4 is already active
```

#### request chassis fabric plane (EX9253 Switch)

```
user@switch>request chassis fabric plane 0 online  
Plane 0 is already active
```



## request chassis fabric pfe

**Syntax** `request chassis fabric pfe pfe-number fpc fpc-number offline`

**Release Information** Command introduced in Junos OS Release 17.2.

**Description** Make a specified fabric of the packet forwarding engine (PFE) offline.

This command makes only the specified PFE of the FPC offline and rest of the PFEs of the FPC are not affected. If a PFE of an FPC is affected because of fabric path wedge errors, the affected PFE is disabled and the associated fabric goes offline as part of fabric hardening actions. The output of the **show chassis fabric fpcs** and **show chassis fabric plane** commands show a new state for the PFE as **Fabric Disabled**.

Fabric stream wedge occurs when the ASIC of the FPC is in the stuck state, and the ingress PFE fails to send traffic to the destination PFE. You can use the request **chassis fabric pfe *pfe-number* fpc *fpc-number* offline** command to make any PFE offline.



**NOTE:** This statement does not have an option to bring the PFE back online. You must restart the FPC to bring the PFE back online.

**Options** `pfe-number—[0–3]`

`pc-number—[0–11] or [0–5] or [0–19] or [0–2], depending on the type of the chassis.`

**Required Privilege Level** `interface`—To view this statement in the configuration.  
`interface-control`—To add this statement to the configuration.

**Related Documentation**

- [show chassis fabric plane on page 1487](#)
- [show chassis fabric fpcs on page 1412](#)

## request chassis feb

---

List of Syntax	<a href="#">Syntax on page 856</a> <a href="#">Syntax (ACX Series Routers) on page 856</a>
Syntax	<code>request chassis feb (offline   online   restart) slot <i>slot-number</i></code>
Syntax (ACX Series Routers)	<code>request chassis feb restart slot <i>slot-number</i></code>
Release Information	Command introduced in Junos OS Release 8.0. Command introduced in Junos OS Release 12.2 for the ACX Series Universal Metro Routers.
Description	(M120 router only) Control the operation of the specified Forwarding Engine Board (FEB).  (ACX Series routers) Restart the specified FEB.
Options	<b>offline</b> —Take the specified FEB offline.  <b>online</b> —Bring the specified FEB online.  <b>restart</b> —Restart the specified FEB.  <b>slot <i>slot-number</i></b> —FEB slot number. Replace <i>slot-number</i> with a value from 0 through 5.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"><li>• <a href="#">show chassis feb on page 1643</a></li><li>• <a href="#">show chassis fabric feb on page 1405</a></li><li>• <a href="#">show chassis fpc-feb-connectivity on page 1723</a></li><li>• <a href="#">feb</a></li><li>• <a href="#">Understanding Switching Control Board Redundancy</a></li></ul>
List of Sample Output	<a href="#">request chassis feb offline slot 0 on page 856</a> <a href="#">request chassis feb online slot 0 on page 857</a> <a href="#">request chassis feb restart slot 0 on page 857</a>
Output Fields	When you enter this command, you are provided feedback on the status of your request.

### request chassis feb (M120 Router)

#### request chassis feb offline slot 0

```
user@host> request chassis feb offline slot 0
```

Offline initiated, use “show chassis feb” to verify

#### request chassis feb online slot 0

```
user@host> request chassis feb online slot 0
```

Online initiated, use “show chassis feb” to verify

#### request chassis feb restart slot 0

```
user@host> request chassis feb restart slot 0
```

Restart initiated, use “show chassis feb” to verify

#### request chassis feb (ACX Series Routers)

```
user@host> request chassis feb restart slot 0
```

FEB will be restarted NOW.

## request chassis fpc

<b>List of Syntax</b>	<a href="#">Syntax on page 858</a> <a href="#">Syntax (TX Matrix and TX Matrix Plus Routers) on page 858</a> <a href="#">Syntax (MX Series Routers) on page 858</a> <a href="#">Syntax (MX2020 Universal Routing Platforms) on page 858</a> <a href="#">Syntax (MX204, MX2010, MX2008, and MX10003 Universal Routing Platforms) on page 858</a> <a href="#">Syntax (EX9200, EX9251, EX9253 Switches) on page 858</a> <a href="#">Syntax (QFabric System) on page 858</a> <a href="#">Syntax (PTX Series Packet Transport Routers) on page 858</a>
<b>Syntax</b>	<code>request chassis fpc (offline   online   restart) slot <i>slot-number</i></code>
<b>Syntax (TX Matrix and TX Matrix Plus Routers)</b>	<code>request chassis fpc (offline   online   restart) slot <i>slot-number</i> &lt;lcc <i>number</i>&gt;</code>
<b>Syntax (MX Series Routers)</b>	<code>request chassis fpc (offline   online   restart) slot <i>slot-number</i> &lt;all-members&gt; &lt;local&gt; &lt;member <i>member-id</i>&gt;</code>
<b>Syntax (MX2020 Universal Routing Platforms)</b>	<code>request chassis fpc (offline   online   restart) slot <i>slot-number</i></code>
<b>Syntax (MX204, MX2010, MX2008, and MX10003 Universal Routing Platforms)</b>	<code>request chassis fpc (offline   online   restart) slot <i>slot-number</i></code>
<b>Syntax (EX9200, EX9251, EX9253 Switches)</b>	<code>request chassis fpc (offline   online   restart) slot <i>slot-number</i></code>
<b>Syntax (QFabric System)</b>	<code>request chassis fpc</code> <code>&lt;interconnect-device <i>name</i> slot <i>slot-number</i> (offline   online)&gt;</code> <code>&lt;(offline   online) interconnect-device <i>name</i> slot <i>slot-number</i>&gt;</code> <code>&lt;slot <i>slot-number</i> interconnect-device <i>name</i> (offline   online)&gt;</code>
<b>Syntax (PTX Series Packet Transport Routers)</b>	<code>request chassis fpc (offline   online   restart) slot <i>slot-number</i></code>

<b>Release Information</b>	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS 11.3 for QFX Series.</p> <p>Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> <p>Command introduced in Junos OS Release 16.1R1 for EX9200 switches.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.4 for MX204 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 18.1R1 for EX9251 Switches.</p> <p>Command introduced in Junos OS Release 18.2 for EX9253 Switches.</p>
<b>Description</b>	<p>(M20, M40, M40e, M120, M160, M320, MX Series, and T Series routers, QFabric systems, EX Series switches, and PTX Series Packet Transport Routers only) Control the operation of the Flexible PIC Concentrator (FPC).</p>



**NOTE:** Starting with Junos OS Release 12.3, it is possible that FPCs brought offline by using the `request chassis fpc slot fpc-slot offline operational-mode` CLI command can come online during a configuration commit or power-supply replacement procedure. As an alternative, use the `set fpc fpc-slot power off configuration-mode` command at the `[edit chassis]` hierarchy level to ensure that the FPCs remain offline.



**NOTE:** In releases earlier than Junos OS Release 15.1F3 and Junos OS Release 16.1, offline FPCs in the PTX5000 router might be powered on by the router during a reboot, or when triggered by other power management events on the router, such as when you take another FPC offline.

Starting with Junos OS Release 15.1F3 and Junos OS Release 16.1, offline FPCs do not come online during reboots or other power management events. To bring such an FPC online:

1. Delete the `fpc fpc-slot power off` statement from the `[edit chassis]` hierarchy level, if that statement is configured, and commit the configuration.
2. Either issue the `request chassis fpc online slot fpc-slot operational-mode` CLI command or press and hold the FPC ONLINE/OFFLINE button for about 5 seconds until the green OK LED next to the button lights steadily.



**NOTE:** If a CLI-based firmware upgrade is in progress, the specified FPC does not restart. Starting with Junos OS Release 15.1, the following message is displayed when this occurs:

```
user@host> request chassis fpc slot 0 restart
FPC 0 Firmware update in progress. Wait!!!
```



**NOTE:** The command `request chassis fpc (offline | online) slot slot-number` is not supported on PTX1000 router. Whereas, `request chassis fpc restart slot slot-number` is supported on PTX1000 router

**Options** **offline**—Take the FPC offline.

**online**—Bring the FPC online.

**interconnect-device *name***—(QFabric systems only) Bring the FPC on the QFX3008-I Interconnect device either offline or online:

- (QFabric System) On a QFabric system, specify the name of the QFX3008-I Interconnect device containing the FPC you want to bring either offline or online.

**restart**—Restart the FPC.

**slot *slot-number***—FPC slot number:

- M20 router—0 through 3.
- M120 router—0 through 5.
- MX240 router—0 through 2. On the MX240 router, slot-number corresponds to the (DPC slot number. If an MPC is installed, slot-number corresponds to the MPC slot number.
- MX480 router—0 through 5. On the MX480 router, slot-number corresponds to the DPC slot number. If an MPC is installed, slot-number corresponds to the MPC slot number.
- MX960 router—0 through 11. On the MX960 router, slot-number corresponds to the DPC slot number. If an MPC is installed, slot-number corresponds to the MPC slot number.
- MX2020 router—0 through 19.
- MX2010 router—0 through 9.
- MX2008 router—0 through 9.

- TX Matrix and TX Matrix Plus routers only—On the TX Matrix router, if you specify the number of the T640 router by using the *lcc number* option (the recommended method), replace *slot-number* with a value from 0 through 7. Otherwise, replace *slot-number* with a value from 0 through 31.

Likewise, on a TX Matrix Plus router, if you specify the number of the T1600 or T4000 router by using the *lcc number* option (the recommended method), replace *slot-number* with a value from 0 through 7. Otherwise, replace *slot-number* with a value from 0 through 31. In case of TX Matrix Plus router with 3D SIBs, replace *slot-number* with a value from 0 through 63. For example, the following commands have the same result:

```
user@host> request chassis fpc lcc 1 slot 1 offline
user@host> request chassis fpc slot 9 offline
```

- Other routers—0 through 7.
- QFabric System—Replace *slot-number* with a value from 0 through 2.
- EX Series switches:
  - EX4200 switches in a Virtual Chassis configuration—Replace *slot-number* with a value from 0 through 9.
  - EX6210 switches—Replace *slot-number* with a value from 0 through 9.



**NOTE:** These commands are not supported for slots 4 and 5 when a Switch Fabric and Routing Engine (SRE) module is installed in those slots. These commands are supported for slots 4 and 5 only if a line card is installed in them.

- EX8208 switches—Replace *slot-number* with a value from 0 through 7.
- EX8216 switches—Replace *slot-number* with a value from 0 through 15.
- EX9204 switches—Replace *slot-number* with a value from 0 through 2.
- EX9208 switches—Replace *slot-number* with a value from 0 through 5.
- EX9214 switches—Replace *slot-number* with a value from 0 through 11.
- PTX5000 Packet Transport Router—Replace *slot-number* with a value from 0 through 7.

**all-members**—(MX Series routers only) (Optional) Change FPC status of all members of the Virtual Chassis configuration.

**local**—(MX Series routers only) (Optional) Change FPC status of the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Change FPC status of the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

**lcc *number***—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**Required Privilege Level** maintenance

**Related Documentation**

- [show chassis fpc on page 1666](#)
- [show chassis fpc-feb-connectivity on page 1723](#)
- [show chassis fabric fpcs on page 1412](#)
- [Configuring the Junos OS to Make a Flexible PIC Concentrator Stay Offline on page 459](#)
- [Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 479](#)
- [MX960 Flexible PIC Concentrator Description](#)

**List of Sample Output**

[request chassis fpc on page 863](#)  
[request chassis fpc \(MX Series Routers with Media Services Blade \[MSB\]\) on page 863](#)  
[request chassis fpc \(MX2020 Router\) on page 863](#)  
[request chassis fpc \(MX2010 Router\) on page 863](#)  
[request chassis fpc \(MX2008 Router\) on page 863](#)  
[request chassis fpc \(MX10003 Router\) on page 863](#)  
[request chassis fpc \(MX204 Router\) on page 863](#)  
[request chassis fpc \(EX9200 Switch\) on page 863](#)  
[request chassis fpc \(EX9251 Switch\) on page 864](#)  
[request chassis fpc \(EX9253 Switch\) on page 864](#)

**Output Fields** When you enter this command, you are provided feedback on the status of your request.



## Sample Output

### request chassis fpc

```
user@host> request chassis fpc online slot 0
FPC 0 already online
```

### request chassis fpc (MX Series Routers with Media Services Blade [MSB])

```
user@host> request chassis fpc slot 0
Possible completions:
  offline          Take FPC offline
  online           Bring FPC online
  restart          Restart FPC
```

### request chassis fpc (MX2020 Router)

```
user@host >request chassis fpc online slot 2
FPC 2 already online
```

### request chassis fpc (MX2010 Router)

```
user@host >request chassis fpc offline slot 5
Offline initiated, use "show chassis fpc" to verify
```

### request chassis fpc (MX2008 Router)

```
user@host >request chassis fpc online slot 5
FPC 5 already online
```

### request chassis fpc (MX10003 Router)

```
user@host>request chassis fpc online slot 1
FPC 1 already online
```

### request chassis fpc (MX204 Router)

```
user@host>request chassis fpc online slot 0
FPC 0 already online
```

### request chassis fpc (EX9200 Switch)

```
user@host> request chassis fpc slot 0
Possible completions:
  offline          Take FPC offline
  online           Bring FPC online
  restart          Restart FPC
```

#### request chassis fpc (EX9251 Switch)

```
user@switch> request chassis fpc online slot 0  
FPC 0 already online
```

#### request chassis fpc (EX9253 Switch)

```
user@switch> request chassis online fpc slot 0  
FPC 0 already online
```

## request chassis fpm resync

<b>List of Syntax</b>	<a href="#">Syntax on page 865</a> <a href="#">Syntax (TX Matrix Routers) on page 865</a> <a href="#">Syntax (TX Matrix Plus Routers) on page 865</a> <a href="#">Syntax (MX Series Routers) on page 865</a> <a href="#">Syntax (MX2010 Universal Routing Platforms) on page 865</a> <a href="#">Syntax (MX2020 Universal Routing Platforms) on page 865</a>
<b>Syntax</b>	request chassis fpm resync
<b>Syntax (TX Matrix Routers)</b>	request chassis fpm resync ( <i>lcc number</i>   <i>scc</i> )
<b>Syntax (TX Matrix Plus Routers)</b>	request chassis fpm resync ( <i>lcc number</i>   <i>sfc number</i> )
<b>Syntax (MX Series Routers)</b>	request chassis fpm resync <all-members> <local> <member <i>member-id</i> >
<b>Syntax (MX2010 Universal Routing Platforms)</b>	request chassis fpm resync
<b>Syntax (MX2020 Universal Routing Platforms)</b>	request chassis fpm resync
<b>Release Information</b>	Command introduced before Junos OS Release 7.4. <b>sfc</b> option introduced for the TX Matrix Plus router in Junos OS Release 9.6. Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms. Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.
<b>Description</b>	(M40e, M120, M160, M320, MX Series, and T Series routers only) Resynchronize the craft interface status.
<b>Options</b>	<b>all-members</b> —(MX Series routers only) (Optional) Resynchronize the craft interface status on all members of the Virtual Chassis configuration.  <b>lcc number</b> —(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers only) (Optional) Resynchronize the craft interface status on the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Resynchronize the craft interface status on the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

**scc**—(TX Matrix routers only) Resynchronize the craft interface status on the TX Matrix router (switch-card chassis).

**sfc *number***—(TX Matrix Plus routers only) Resynchronize the craft interface status on the TX Matrix Plus router (or switch-fabric chassis). Replace *number* with 0.

**Required Privilege Level** maintenance

**Related Documentation**

- [show chassis environment fpm on page 1150](#)
- [Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 479](#)

**List of Sample Output** [request chassis fpm resync on page 866](#)  
[request chassis fpm resync \(MX2010 Router\) on page 866](#)

**Output Fields** When you enter this command, you are provided feedback on the status of your request.

## Sample Output

[request chassis fpm resync](#)

```
user@host> request chassis fpm resync
Front Panel resynced
```

[request chassis fpm resync \(MX2010 Router\)](#)

```
user@host > request chassis fpm resync
```

Front Panel resynced.

## request chassis lcc

<b>Syntax (TX Matrix and TX Matrix Plus Routers)</b>	<code>request chassis lcc (offline   online) slot <i>slot-number</i></code>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	(TX Matrix and TX Matrix Plus routers only) On a TX Matrix router, control the operation of a T640 LCC that is connected to the TX Matrixrouter. On a TX Matrix Plus router, control the operation of a LCC that is connected to the TX Matrix Plus router.
<b>Options</b>	<p><b>offline</b>—On a routing matrix based on the TX Matrix router (switch-card chassis), take the T640 router (line-card chassis) offline. On a routing matrix based on a TX Matrix Plus router (switch-fabric chassis), take the router (line-card chassis) offline.</p> <p><b>online</b>—On a routing matrix based on the TX Matrix router (switch-card chassis), bring the T640 router (line-card chassis) online. On a routing matrix based on a TX Matrix Plus router (switch-fabric chassis), bring the router (line-card chassis) online.</p> <p><b>slot <i>slot-number</i></b>—On a TX Matrix router (switch-card chassis), the slot number of a T640 router ( line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router (switch-fabric chassis), the slot number of a router (line-card chassis) that is connected to the TX Matrix Plus (switch-fabric chassis) router.</p> <p><i>slot-number</i> has the following values depending on the LCC configuration</p> <p>Replace <i>slot-number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> <li>• 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.</li> <li>• 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.</li> <li>• 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> <li>• 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> </ul>
<b>Required Privilege Level</b>	maintenance
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">show chassis lccs on page 1997</a></li> <li>• <i>Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade</i></li> <li>• <i>fpc</i></li> </ul>

List of Sample Output [request chassis lcc on page 869](#)

**Output Fields** When you enter this command, you are provided feedback on the status of your request.

### Sample Output

[request chassis lcc](#)

```
user@host> request chassis lcc offline slot 0
```

## request chassis mcs

---

Syntax	<code>request chassis mcs (offline   online   restart) slot <i>slot-number</i></code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M40e and M160 routers only) Control the operation of the Miscellaneous Control Subsystem (MCS).
Options	<b>offline</b> —Take the MCS offline. <b>online</b> —Bring the MCS online. <b>restart</b> —Restart the MCS. <b>slot <i>slot-number</i></b> —MCS slot number. Replace <i>slot-number</i> with 0 or 1.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"><li>• <a href="#">show chassis environment mcs on page 1179</a></li></ul>
List of Sample Output	<a href="#">request chassis mcs on page 870</a>
Output Fields	When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### request chassis mcs

```
user@host> request chassis mcs online slot 0
MCS 0 appears to be online already
```



## request chassis mic

**Syntax** `request chassis mic (offline | online) fpc-slot slot-number mic-slot slot-number`

**Release Information** Command introduced in Junos OS Release 10.1.  
 Command introduced in Junos OS Release 12.3 for ACX4000 Series Router.  
 Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.  
 Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.  
 Command introduced in Junos OS Release 13.2 for MX104 Universal Routing Platforms.  
 Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.

**Description** (MX Series routers only) Control the operation of the Modular Interface Cards (MICs) installed on a Modular Port Concentrator (MPC).



**NOTE:** On MX960 routers, if the MIC is not functioning correctly, you should take the MPC offline, replace it with a new MPC, and reinstall the MIC. On MX104 routers, the `request chassis mic` command is not supported on FPC slot 2 and MIC slot 0.

**Options** **offline**—Take the MIC offline.

**online**—Bring the MIC online.

**fpc-slot *slot-number***—FPC slot number where the MIC is installed:

- ACX4000 router—Replace **fpc-slot** with the value 0 or 1.
- MX80 router—Replace **fpc-slot** with the value 1. This command is not supported on FPC slot 0.
- MX104—Replace **fpc-slot** with the value from 0 through 2.
- MX240 router—Replace **fpc-slot** with a value from 0 through 2.
- MX480 router—Replace **fpc-slot** with a value from 0 through 5.
- MX960 router—Replace **fpc-slot** with a value from 0 through 11.
- MX2020 router—Replace **fpc-slot** with a value from 0 through 19.
- MX2010 router—Replace **fpc-slot** with a value from 0 through 9.
- MX2008 router—Replace **fpc-slot** with a value from 0 through 9.

**mic-slot *slot-number***—MIC slot number. Replace **slot-number** with 0 or 1.

**Required Privilege Level** maintenance

**Related Documentation** • [show chassis hardware on page 1726](#)

**List of Sample Output** [request chassis mic online on page 872](#)  
[request chassis mic \(MX Routers with Media Services Blade \[MSB\]\) on page 872](#)  
[request chassis mic offline \(MX104 Router\) on page 872](#)  
[request chassis mic online \(MX2010 Router\) on page 872](#)  
[request chassis mic online \(MX2008 Router\) on page 872](#)

**Output Fields** When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### [request chassis mic online](#)

```
user@host> request chassis mic online fpc-slot 1 mic-slot 1
```

### [request chassis mic \(MX Routers with Media Services Blade \[MSB\]\)](#)

```
user@host> request chassis mic fpc-slot 1 mic-slot 0
```

Possible completions:

offline	Take MIC offline
online	Bring MIC online

### [request chassis mic offline \(MX104 Router\)](#)

```
user@host > request chassis mic mic-slot 0 fpc-slot 1 offline
```

```
fpc 1 mic 0 offline initiated, use "show chassis fpc pic-status 1" to verify
```

### [request chassis mic online \(MX2010 Router\)](#)

```
user@host> request chassis mic online fpc-slot 1 mic-slot 0
```

```
FPC 1, MIC 0 is already online
```

### [request chassis mic online \(MX2008 Router\)](#)

```
user@host>request chassis mic online fpc-slot 0 mic-slot 0
```

```
FPC 0 is not online
```

## request chassis optics

<b>Syntax</b>	<code>request chassis optics fpc-slot <i>fpc-slot-number</i> reactivate</code>
<b>Syntax ( EX9253 Switches)</b>	<code>request chassis optics fpc-slot <i>fpc-slot-number</i> reactivate</code>
<b>Release Information</b>	<p>Command introduced in Junos OS Release 12.3 for MX240, MX480, and MX960 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 18.1R1 for EX9251 Switches.</p> <p>Command introduced in Junos OS Release 18.2 for EX9253 Switches.</p>
<b>Description</b>	(MX240, MX480, and MX960 routers) Control the status of the optical transceiver.
<b>Options</b>	<p><b>fpc-slot <i>fpc-slot-number</i></b>—Slot number of the line card that houses the optical transceiver.</p> <ul style="list-style-type: none"> <li>MX240 router—Replace <i>fpc-slot-number</i> with a value from 0 through 2.</li> <li>MX480 router—Replace <i>fpc-slot-number</i> with a value from 0 through 5.</li> <li>MX960 router—Replace <i>fpc-slot-number</i> with a value from 0 through 11.</li> </ul> <p><b>reactivate</b>—Reactivate the optical transceiver.</p>
<b>Required Privilege Level</b>	maintenance
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><i>Determining Transceiver Support and Specifications for M Series and T Series Routers</i></li> </ul>
<b>List of Sample Output</b>	<a href="#">request chassis optics (MX480 router) on page 873</a> <a href="#">request chassis optics (MX10003 router) on page 874</a> <a href="#">request chassis optics (EX9251 switch) on page 874</a> <a href="#">request chassis optics (EX9253 switch) on page 874</a>
<b>Output Fields</b>	When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### request chassis optics (MX480 router)

```
user@host> request chassis optics fpc-slot 5 reactivate
Enable FPC 5 non-nebs optics.
```

#### request chassis optics (MX10003 router)

```
user@host>request chassis optics fpc-slot 1 reactivate  
Enable FPC 1 non-nebs optics.
```

#### request chassis optics (EX9251 swich)

```
user@switch>request chassis optics fpc-slot 0 reactivate  
Enable FPC 0 non-nebs optics.
```

#### request chassis optics (EX9253 swich)

```
user@switch>request chassis optics fpc-slot 1 reactivate  
Enable FPC 1 non-nebs optics.
```

## request chassis pcg

<b>Syntax</b>	<code>request chassis pcg (offline   online) slot <i>slot-number</i></code>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	(M40e and M160 routers) Control the operation of the Packet Forwarding Engine (PFE) clock generator (PCG).
<b>Options</b>	<p><b>offline</b>—Take the PCG offline.</p> <p><b>online</b>—Bring the PCG online.</p> <p><b>slot <i>slot-number</i></b>—PCG slot number. Replace <i>slot-number</i> with 0 or 1.</p>
<b>Required Privilege Level</b>	maintenance
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">show chassis environment pcg on page 1204</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">request chassis pcg on page 875</a>
<b>Output Fields</b>	When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### request chassis pcg

```
user@host> request chassis pcg online slot 0
PCG 1 appears to be already online
```

## request chassis pic

<b>List of Syntax</b>	<a href="#">Syntax on page 876</a> <a href="#">Syntax (ACX4000 Series Routers) on page 876</a> <a href="#">Syntax (MX Series Routers) on page 876</a> <a href="#">Syntax (TX Matrix and TX Matrix Plus Routers) on page 876</a> <a href="#">Syntax (EX9251, EX9253 Switches) on page 876</a>
<b>Syntax</b>	request chassis pic (offline   online) fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i>
<b>Syntax (ACX4000 Series Routers)</b>	request chassis pic (offline   online) fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i>
<b>Syntax (MX Series Routers)</b>	request chassis pic (offline   online) fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i> <member <i>member-id</i> >
<b>Syntax (TX Matrix and TX Matrix Plus Routers)</b>	request chassis pic (offline   online) fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i> <lcc <i>number</i> >
<b>Syntax (EX9251, EX9253 Switches)</b>	request chassis pic (offline   online) pic-slot <i>slot-number</i> fpc--slot <i>slot-number</i> <lcc <i>number</i> >
<b>Release Information</b>	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 12.3 for ACX4000 Routers.</p> <p>Command introduced in Junos OS Release 13.2 for the QFX Series.</p> <p>Command introduced in Junos OS Release 17.2 for PTX10008 Routers.</p> <p>Option <b>member</b> introduced in Junos OS Release 14.2 for MX Series routers.</p> <p>Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 18.1R1 for EX9251 Switches.</p> <p>Command introduced in Junos OS Release 18.2 for EX9253 Switches.</p>
<b>Description</b>	Control the operation of the PIC.



**NOTE:** The request chassis pic (offline | online) fpc-slot *slot number* pic-slot *slot-number* command is not supported for built-in PICs on MX Series routers.

To view a list of built-in PICs on the router or switch chassis, use the show chassis hardware command.



**NOTE:** This command is not supported on MX960 and MX2020 routers with MPC5EQ.



**NOTE:** T1600 routers and TX Matrix Plus routers with 100-Gigabit Ethernet PICs require two adjacent PIC slots, 0 and 1, for each PIC. Therefore, only online and offline command options to PIC slot 0 are allowed. Use of the online and offline command options for PIC slot 1 with the described router and PIC combination is not allowed.



**NOTE:** In T Series routers, when the PIC state is set from offline to online or vice-versa before the processing is complete for the previous command, you are provided feedback on the status of your request. The following sample messages are displayed if you try to set a PIC offline or online:

```
user@switch> request chassis pic fpc-slot 1 pic-slot 0 online
fpc 1 pic 0 online initiated, use "show chassis fpc pic-status" to verify

user@switch> request chassis pic fpc-slot 1 pic-slot 0 online
FPC 1 PIC 0 already transitioning to online
```

When the same PIC is set to a different state while the transition is in progress, you are provided feedback on the status of your request.

```
user@switch> request chassis pic fpc-slot 1 pic-slot 0 offline
FPC 1, PIC 0 already transitioning to online. Please retry later.
```



**NOTE:** If a CLI-based firmware upgrade is in progress, it prevents the specified PIC from restarting. Starting in Junos OS Release 15.1, the following message is displayed:

```
user@host> request chassis pic fpc-slot 0 pic-slot 1 offline
PIC's Firmware update in progress. Wait!!!
```



**NOTE:** The command `request chassis pic (offline | online) fpc-slot slot-number pic-slot slot-number` is not supported on PTX1000 routers.

**Options**   **offline**—Take the PIC offline.

**online**—Bring the PIC online.

**fpc-slot *slot-number***—Flexible PIC Concentrator (FPC) slot number. Replace *slot-number* with a value appropriate for your router or switch:

- ACX4000 routers—1 or 2.
- EX Series switches:
  - EX3200 switches and EX4200 standalone switches—0.
  - EX4200 switches in a Virtual Chassis configuration—0 through 9 (switch's member ID).
  - EX8208 switches—0 through 7 (line card).
  - EX8216 switches—0 through 15 (line card).
- M5, M7i, M10, and M10i routers—0 or 1.
- M20 routers—0 through 3.
- M40 and M40e routers—0 through 7.
- M120 routers—0 through 5.
- M160 routers—0 through 7.
- M320 routers—0 through 7.
- MX 5, MX10, and MX40 routers—0 or 1.
- MX80 routers—0 or 1.
- MX240 routers—0 through 2
- MX480 routers—0 through 5
- MX2020 routers—0 through 19.
- MX2010 routers—0 through 9.
- MX960 routers—0 through 11.
- MX10003 routers—0 or 1.
- MX204 routers—0.
- PTX5000 routers—0 or 1.
- T Series routers—0 through 7.
- TX Matrix and TX Matrix Plus routers only—On a TX Matrix router, if you specify the number of the T640 router by using the *lcc number* option (the recommended method), replace *slot-number* with a value from 0 through 7. Otherwise, replace *slot-number* with a value from 0 through 31.

Likewise, on a TX Matrix Plus router, if you specify the *number* of the T1600 or T4000 router by using the *lcc number* option (the recommended method), replace *slot-number* with a value from 0 through 7. Otherwise, for the FPC slot number,



replace *slot-number* with a value from 0 through 31. On a TX Matrix Plus router with 3D SIBs to assign the FPC slot number, replace *slot-number* with a value from 0 through 63. For example, the following commands have the same result:

```
user@host> request chassis pic fpc-slot 1 lcc 1 pic-slot 0 offline
user@host> request chassis pic fpc-slot 9 pic-slot 0 offline
```

- QFX5100 standalone switches—0.

**lcc *number***—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**member *member-id***—(MX Series routers only) (Optional) Change the PIC status on the specified member of the Virtual Chassis configuration. Replace *member-id* with the value that is assigned to the specified member.

**offline**—Take the PIC offline.

**online**—Bring the PIC online.

**pic-slot *slot-number***—PIC slot number.

- EX3200 and EX4200 switches—0 for built-in network interfaces and 1 for interfaces on uplink modules.
- EX8208 and EX8216 switches—0.
- M Series routers—0, 1, 2, or 3
- MX960 router—*slot-number* corresponds to the slot number of the Packet Forwarding Engine.
- MX204 router—0 or 1.
- PTX5000 routers—0 or 1.
- T320 router—0 or 1.
- T640 router—0, 1, 2, or 3.
- T1600 router —0, 1, 2, or 3.

- T4000 router—0, 1, 2, or 3.
- QFX5100 standalone switches—0, 1, or 2. PIC 0 is used for all interfaces that are not configured on expansion modules, and PIC 1 and PIC 2 are used for interfaces configured on expansion modules.

**Required Privilege Level** maintenance

**Related Documentation**

- [show chassis hardware on page 1726](#)
- [show chassis pic on page 2019](#)

**List of Sample Output**

[request chassis pic on page 880](#)  
[request chassis pic online member \(MX Series Routers\) on page 880](#)  
[request chassis pic offline member \(MX Series Routers\) on page 880](#)  
[request chassis pic \(MX10003 Router\) on page 880](#)  
[request chassis pic online member \(PTX10008 Router\) on page 881](#)  
[request chassis pic online member \(EX9251 Switch\) on page 881](#)  
[request chassis pic online member \(EX9253 Switch\) on page 881](#)

**Output Fields** When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### `request chassis pic`

```
user@host> request chassis pic pic-slot 0 online fpc-slot 0
FPC 0, PIC 0 is already online
```

### `request chassis pic online member (MX Series Routers)`

```
user@host> request chassis pic online member 1 fpc-slot 11 pic-slot 3
fpc 11 pic 3 online initiated
```

### `request chassis pic offline member (MX Series Routers)`

```
user@host> request chassis pic offline member 1 fpc-slot 11 pic-slot 3
fpc 11 pic 3 offline initiated
```

### `request chassis pic (MX10003 Router)`

```
user@host> request chassis pic online pic-slot 1 fpc-slot 0
FPC 0 is not online
```

**request chassis pic online member (PTX10008 Router)**

```
user@host> request chassis pic online pic-slot 1 fpc-slot 0
FPC 0, PIC 1 is empty
```

**request chassis pic online member (EX9251 Switch)**

```
user@switch> request chassis pic pic-slot 0 online fpc-slot 0
FPC 0, PIC 0 is already online
```

**request chassis pic online member (EX9253 Switch)**

```
user@switch> request chassis pic pic-slot 0 online fpc-slot 0
FPC 0, PIC 0 is already online
```

## request chassis port-led

**Syntax** `request chassis port-led (start | stop) fpc-slot fpc-slot-number pic-slot pic-slot-number port (port-number | all-10g | all-40g | all-100g | all-port) duration duration`

**Release Information** Command introduced in Junos OS Release 15.1F4 for MPC7E-MRATE, MPC8E, and MPC9E. Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms. Command introduced in Junos OS Release 17.4 for MX204 Universal Routing Platforms. Command introduced in Junos OS Release 18.1R1 for EX9251 Switch. Command introduced in Junos OS Release 18.2R1 for JNP10K-LC2101 on MX10008 Universal Routing Platforms.

**Description** Enable remote port identification of the Modular Interface Card (MIC) or PIC by making the LED of the appropriate active port blink for a duration of time. You can also make the LEDs of all active ports, specific active ports, and specific port types blink. For instance, on MX480 routers with MPC7E-MRATE, you can make the LED of all active ports that support port speeds of 100 Gbps blink. Enabling remote port identification provides cabling assistance and reduces cabling mistakes.



**NOTE:** You can stop a LED from blinking before the end of duration. After the LED stops blinking, it resumes its normal operation of indicating current link status of the port.

**Options** **start**—Start blinking of the LEDs of the specified ports.

**stop**—Stop the LEDs of the specified ports from blinking.

**fpc-slot *fpc-slot-number***—(MX Series routers) Modular Port Concentrator (MPC) slot number. Replace *fpc-slot-number* with a value appropriate for your router:

- MX240 routers—0 through 2.
- MX480 routers—0 through 5.
- MX960 routers—0 through 11.
- MX2010 routers—0 through 9.
- MX2020 routers—0 through 19.
- MX10003 routers—0 through 1.
- MX10008 routers—0 through 6.

**pic-slot *pic-slot-number***—(MX Series routers) MIC slot number. Replace *pic-slot-number* with a value from 0 through 3. For MX10008 routers with JNP10K-LC2101 MPC only, replace *pic-slot-number* with a value from 0 through 5.

**port *port-number***—Port number. Replace *port-number* with a value appropriate for your MPC or line card:

- MIC-MRATE—0 through 11.
- MX10003 MPC—0 through 5 for PIC 0 and 0 through 11 for PIC1
- JNP10K-LC2101 MPC—0 through 3 per PIC. JNP110K-LC2101 supports 6 built-in PICs and each PIC supports 4 ports.

**all-10g**—Active ports that support port speed of 10 Gbps.

**all-40g**—Active ports that support port speed of 40 Gbps.

**all-100g**—Active ports that support port speed of 100 Gbps.

**all-ports**—All active ports.

**duration *duration***—Duration, in seconds, to perform LED blinking. Replace *duration* with a value from 0 through 65,535. The default duration is 5 minutes (300 seconds).

**Required Privilege Level**

view

**Related Documentation**

- [Remote Port Identification using LEDs for Cabling Assistance on page 70](#)

**List of Sample Output**

[request chassis port-led \(MX2020 Routers with MPC8E\) on page 883](#)  
[request chassis port-led \(MX480 Routers with MPC7E-MRATE\) on page 883](#)  
[request chassis port-led \(MX10003 Router\) on page 884](#)  
[request chassis port-led \(MX10003 Router for all active 100GE ports\) on page 884](#)  
[request chassis port-led \(MX10003 Router for all active 40GE ports\) on page 884](#)  
[request chassis port-led \(MX10003 Router for all the active ports in a PIC\) on page 884](#)  
[request chassis port-led \(MX204 Router for all the active ports in a PIC\) on page 884](#)  
[request chassis port-led \(EX9251 Switch\) on page 884](#)  
[request chassis port-led \(MX10008 Router with JNP10K-LC2101\) on page 884](#)

**Output Fields**

When you enter this command, you are asked to verify the LED status based on your request.

## Sample Output

[request chassis port-led \(MX2020 Routers with MPC8E\)](#)

```
user@host> request chassis port-led start fpc-slot 3 pic-slot 0 port all-10g duration 5
Command sent to FPC_3. Check physically about LED status on the PIC_0 ports.
```

[request chassis port-led \(MX480 Routers with MPC7E-MRATE\)](#)

```
user@host> request chassis port-led start fpc-slot 3 pic-slot 0 port 2 duration 5
```

```
Command sent to FPC_3. Check physically about LED status on the PIC_0 ports.
```

#### request chassis port-led (MX10003 Router)

```
user@host> request chassis port-led start fpc-slot 1 pic-slot 1 port 0 duration 5
```

```
Command sent to FPC_1. Check physically about LED status on the PIC_1 ports.
```

#### request chassis port-led (MX10003 Router for all active 100GE ports)

```
user@host> request chassis port-led start fpc-slot 1 pic-slot 1 port all-100g duration 5
```

```
Command sent to FPC_1. Check physically about LED status on the PIC_1 ports.
```

#### request chassis port-led (MX10003 Router for all active 40GE ports)

```
user@host> request chassis port-led start fpc-slot 0 pic-slot 1 port all-40g duration 5
```

```
Command sent to FPC_0. Check physically about LED status on the PIC_1 ports.
```

#### request chassis port-led (MX10003 Router for all the active ports in a PIC)

```
user@host> request chassis port-led start fpc-slot 0 pic-slot 0 port all-ports duration 5
```

```
Command sent to FPC_0. Check physically about LED status on the PIC_0 ports.
```

#### request chassis port-led (MX204 Router for all the active ports in a PIC)

```
user@host> request chassis port-led start fpc-slot 0 pic-slot 0 port all-ports duration 5
```

```
Command sent to FPC_0. Check physically about LED status on the PIC_0 ports.
```

#### request chassis port-led (EX9251 Switch)

```
user@switch> request chassis port-led start fpc-slot 0 pic-slot 0 port all-ports duration 5
```

```
Command sent to FPC_0. Check physically about LED status on the PIC_0 ports.
```

#### request chassis port-led (MX10008 Router with JNP10K-LC2101)

```
user@host> request chassis port-led start fpc-slot 0 pic-slot 2 all-ports duration 15
```

```
Command sent to FPC_0. Check physically about LED status on the PIC_2 ports.
```

## request chassis redundancy feb slot

<b>Syntax</b>	<code>request chassis redundancy feb slot <i>slot-number</i> (switch-to-backup   revert-from-backup)</code>
<b>Release Information</b>	Command introduced in Junos OS Release 8.2.
<b>Description</b>	(M120 routers only) Control the operation of the specified Forwarding Engine Board (FEB) in a redundancy group.
<b>Options</b>	<p><b><i>slot-number</i></b>—FEB slot number. Replace <b><i>slot-number</i></b> with a value from 0 through 5.</p> <p><b><i>switch-to-backup</i></b>—Initiate a switchover from the specified active FEB to the backup FEB for the redundancy group.</p> <p><b><i>revert-from-backup</i></b>—Initiate a revert to the specified FEB following a switchover to the backup FEB for a redundancy group.</p>
<b>Required Privilege Level</b>	maintenance
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">show chassis redundancy feb on page 2080</a></li> <li>• <i>Configuring FEB Redundancy on the M120 Router</i></li> <li>• <i>Understanding Switching Control Board Redundancy</i></li> </ul>
<b>List of Sample Output</b>	<a href="#">request chassis redundancy feb slot 2 switch-to-backup on page 885</a> <a href="#">request chassis redundancy feb slot 3 revert-to-backup on page 885</a>
<b>Output Fields</b>	When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### request chassis redundancy feb slot 2 switch-to-backup

```
user@host> request chassis redundancy feb slot 2 switch-to-backup
Switch initiated, use "show chassis redundancy febs" to verify
```

### request chassis redundancy feb slot 3 revert-to-backup

```
user@host> request chassis redundancy feb slot 3 revert-to-backup
Revert initiated, use "show chassis redundancy febs" to verify
```

## request chassis routing-engine master

<b>List of Syntax</b>	<a href="#">Syntax on page 886</a> <a href="#">Syntax (M Series, MX Series, T Series Routers) on page 886</a> <a href="#">Syntax (TX Matrix Routers) on page 886</a> <a href="#">Syntax (TX Matrix Plus Routers) on page 886</a> <a href="#">Syntax (MX Series Virtual Chassis) on page 886</a> <a href="#">Syntax (QFX Series) on page 886</a>
<b>Syntax</b>	request chassis routing-engine master (acquire   release   switch) <no-confirm>
<b>Syntax (M Series, MX Series, T Series Routers)</b>	request chassis routing-engine master (acquire   release   switch) <no-confirm> <check>
<b>Syntax (TX Matrix Routers)</b>	request chassis routing-engine master (acquire   release   switch) (lcc <i>number</i>   scc   all-chassis) <no-confirm>
<b>Syntax (TX Matrix Plus Routers)</b>	request chassis routing-engine master (acquire   release   switch) (lcc <i>number</i>   sfc   all-chassis   all-lcc) <no-confirm>
<b>Syntax (MX Series Virtual Chassis)</b>	request chassis routing-engine master (acquire   release   switch) <all-members> <check> <local> <member <i>member-id</i> > <no-confirm>
<b>Syntax (QFX Series)</b>	request chassis routing-engine master (release   switch) <check> <interconnect-device <i>name</i> > <node-group <i>name</i> > <no-confirm>
<b>Release Information</b>	<p>Command introduced before Junos OS Release 7.4.</p> <p><b>all-chassis</b> option added in Junos OS Release 8.0.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p><b>sfc</b> option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.3 for QFX Series.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.</p>



Command introduced in Junos OS Release 13.2 for MX104 Universal Routing Platforms.  
 Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.  
 Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.  
 Command introduced in Junos OS Release 17.2 for PTX10008 Routers.

**Description** For routers or switches with multiple Routing Engines, control which Routing Engine is the master.



**CAUTION:** (Routing matrix based on the TX Matrix or TX Matrix Plus routers only) Within the routing matrix, we recommend that all Routing Engines run the same Junos OS Release. If you run different releases on the Routing Engines and a change in mastership occurs on any backup Routing Engine in the routing matrix, one or all routers (in a routing matrix based on the TX Matrix router or in a routing matrix based on a TX Matrix Plus router) might become logically disconnected from the TX Matrix router and cause data loss. For more information, see the [TX Matrix Router Hardware Guide](#) or the [High Availability Feature Guide](#).



**NOTE:** Successive graceful Routing Engine switchover events must be a minimum of 240 seconds (4 minutes) apart after both Routing Engines have come up.

If the router or switch displays a warning message similar to “Standby Routing Engine is not ready for graceful switchover. Packet Forwarding Engines that are not ready for graceful switchover might be reset,” do not attempt switchover. If you choose to proceed with switchover, only the Packet Forwarding Engines that were not ready for graceful switchover are reset. None of the Flexible PIC concentrators (FPCs) should spontaneously restart. We recommend that you wait until the warning no longer appears and then proceed with the switchover.

You will receive an error message stating “Command aborted. Not ready for mastership switch, try after n seconds” when this command is re-entered before 240 seconds have elapsed on EX Series switches.



**NOTE:** On a QFabric system, to avoid traffic loss on the network Node group, switch mastership of the routing engine to the backup routing engine, and then reboot.

**Options** **acquire**—Attempt to become the master Routing Engine.

**release**—Request that the other Routing Engine become the master.

**switch**—Toggle mastership between Routing Engines.



**NOTE:** The **acquire** option should be used with caution because acquiring a Routing Engine may result in a corrupted database. If possible, use the **switch** option instead.

The **acquire**, **release**, and **switch** options have the following suboptions:

**all-chassis**—(TX Matrix and TX Matrix Plus routers only) On a routing matrix composed of a TX Matrix router and the attached T640 routers, switch mastership on all the Routing Engines in the routing matrix. Likewise, on a routing matrix composed of a TX Matrix Plus router and the attached T1600 or T4000 routers, switch mastership on all the Routing Engines in the routing matrix.

**all-lcc**—(TX Matrix Plus routers only) Request to acquire mastership for all line-card chassis (LCC).

**all-members**—(MX Series routers only) (Optional) Control Routing Engine mastership on the Routing Engines in all member routers of the Virtual Chassis configuration.

**check**—(QFabric systems, MX104, MX480, MX960, MX2010, MX2020, and MX2008 routers, and PTX5000 routers only) (Optional) Available with the **switch**, **release**, and **acquire** options. Check graceful switchover status of the standby Routing Engine before toggling mastership between Routing Engines.

**interconnect-device *name***—(QFabric systems only) (Optional) Control Routing Engine mastership on the Routing Engines on an Interconnect device.

**lcc *number***—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers only) (Optional) Control Routing Engine mastership on the Routing Engines in the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Control Routing Engine mastership on the Routing Engines of the specified member in the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

**no-confirm**—(Optional) Do not request confirmation for the switch.

**node-group *name***—(QFabric systems only) (Optional) Control Routing Engine mastership on the Routing Engines on a Node group.

**scc**—(TX Matrix routers only) TX Matrix (switch-card chassis).

**sfc**—(TX Matrix Plus routers only) TX Matrix Plus router (or switch-fabric chassis).

**Additional Information** Because both Routing Engines are always running, the transition from one to the other as the master Routing Engine is immediate. However, the changeover interrupts communication to the System and Switch Board (SSB). The SSB takes several seconds to reinitialize the Flexible PIC Concentrators (FPCs) and restart the PICs. Interior gateway protocol (IGP) and BGP convergence times depend on the specific network environment.

By default, the Routing Engine in slot 0 (**RE0**) is the master and the Routing Engine in slot 1 (**RE1**) is the backup. To change the default master Routing Engine, include the **routing-engine** statement at the **[edit chassis redundancy]** hierarchy level in the configuration. For more information, see the *Junos OS Administration Library*

To have the backup Routing Engine become the master Routing Engine, use the **request chassis routing-engine master switch** command. If you use this command to change the master and then restart the chassis software for any reason, the master reverts to the default setting.



**NOTE:** Although the configurations on the two Routing Engines do not have to be the same and are not automatically synchronized, we recommend making both configurations the same.

**Required Privilege Level** maintenance

**Related Documentation**

- [show chassis routing-engine on page 2083](#)
- *Configuring Routing Engine Redundancy*
- *Switching the Global Master and Backup Roles in a Virtual Chassis Configuration*

**List of Sample Output**

- [request chassis routing-engine master acquire on page 890](#)
- [request chassis routing-engine master switch on page 890](#)
- [request chassis routing-engine master switch check on page 890](#)

**Output Fields** When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### request chassis routing-engine master acquire

```
user@host> request chassis routing-engine master acquire
```

```
warning: Traffic will be interrupted while the PFE is re-initialized
```

```
warning: The other routing engine's file system could be corrupted
```

```
Reset other routing engine and become master ? [yes,no] (no)
```

### request chassis routing-engine master switch

```
user@host> request chassis routing-engine master switch
```

```
warning: Traffic will be interrupted while the PFE is re-initialized
```

```
Toggle mastership between Routing Engines ? [yes,no] (no) yes
```

```
Resolving mastership...
```

```
Complete. The other Routing Engine becomes the master.
```

Switch mastership back to the local Routing Engine:

```
user@host> request chassis routing-engine master switch
```

```
warning: Traffic will be interrupted while the PFE is re-initialized
```

```
Toggle mastership between routing engines ? [yes,no] (no) yes
```

```
Resolving mastership...
```

```
Complete. The local routing engine becomes the master.
```

### request chassis routing-engine master switch check

Usage shown for M Series, MX Series, and T Series routers.

```
{master}[edit]
```

```
user@host> request chassis routing-engine master switch check
```

```
warning: Standby Routing Engine is not ready for graceful switchover.
```

```
{master}[edit]
```

```
user@host> request chassis routing-engine master switch check
```

```
Switchover Ready
```

You can similarly check the backup Routing Engine.

## request chassis scg

<b>List of Syntax</b>	<a href="#">Syntax on page 891</a> <a href="#">Syntax (TX Matrix and TX Matrix Plus Routers) on page 891</a>
<b>Syntax</b>	request chassis scg (offline   online) slot <i>slot-number</i>
<b>Syntax (TX Matrix and TX Matrix Plus Routers)</b>	request chassis scg lcc <i>number</i> (offline   online) slot <i>slot-number</i>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	(T Series routers only) Control the operation of the specified SONET Clock Generator (SCG).
<b>Options</b>	<p><b>lcc <i>number</i></b>—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.</p> <p>Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> <li>• 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.</li> <li>• 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.</li> <li>• 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> <li>• 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> </ul> <p><b>offline</b>—Take the SCG offline. When you change the SCG status to offline, the unit is not powered down.</p> <p><b>online</b>—Bring the SCG online.</p> <p><b>slot <i>slot-number</i></b>—SCG slot number. Replace <i>slot-number</i> with 0 or 1.</p>
<b>Required Privilege Level</b>	maintenance
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">show chassis environment scg on page 1248</a></li> <li>• <i>Configuring the Clock Source</i></li> <li>• <i>T320 SONET Clock Generator (SCG) Description</i></li> </ul>

**List of Sample Output** [request chassis scg on page 892](#)

**Output Fields** When you enter this command, you are provided feedback on the status of your request.

## Sample Output

[request chassis scg](#)

```
user@host> request chassis scg online slot 0
```

```
Online initiated, use "show chassis environment scg" to verify
```

## request chassis sfb

<b>Syntax</b>	request chassis sfb (offline   online) slot <i>slot-number</i> <all-members> <local> <member <i>member-id</i> >
<b>Release Information</b>	Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms. Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms. <b>all-members</b> , <b>local</b> , and <b>member <i>member-id</i></b> options introduced in Junos OS Release 15.1 for MX2020 and MX2010 routers. Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.
<b>Description</b>	Control the operation of the Switch Fabric Board (SFB).
<b>Options</b>	<p><b>all-members</b>—(Optional) Control the operation of the SFB in all members of the Virtual Chassis configuration.</p> <p><b>local</b>—(Optional) Control the operation of the SFB in the local Virtual Chassis member.</p> <p><b>member <i>member-id</i></b>—(Optional) Control the operation of the SFB in the specified member of the Virtual Chassis. Replace <i>member-id</i> with the value 0 or 1.</p> <p><b>offline</b>—Take the Switch Fabric Board offline.</p> <p><b>online</b>—Bring the Switch Fabric Board online.</p> <p><b>slot <i>slot-number</i></b>—Switch Fabric Board slot number. Replace <i>slot-number</i> with a value of 0 through 7.</p>
<b>Required Privilege Level</b>	maintenance
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">show chassis sfb on page 2116</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">request chassis sfb on page 893</a> <a href="#">request chassis sfb (MX2010 Routers) on page 894</a> <a href="#">request chassis sfb (MX2008 Routers) on page 894</a>
<b>Output Fields</b>	When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### request chassis sfb

```
user@host> request chassis sfb offline slot 1
Backup SFB 1 cannot be set offline, backup RE is online
```

#### request chassis sfb (MX2010 Routers)

```
user@host> request chassis sfb offline slot 7
```

```
Offline initiated, use "show chassis sfb" to verify
```

#### request chassis sfb (MX2008 Routers)

```
user@host>request chassis sfb offline slot 1
```

```
Offline initiated, use "show chassis sfb" to verify
```



## request chassis sfm master switch

<b>Syntax</b>	<code>request chassis sfm master switch</code> <code>&lt;no-confirm&gt;</code>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	(M40e and M160 routers only) Control which Switching and Forwarding Module (SFM) is master.
<b>Options</b>	<b>no-confirm</b> —(Optional) Do not display a switch warning or query.
<b>Additional Information</b>	<p>By default, the SFM in slot 0 (SFM0) is the master and the SFM in slot 1 (SFM1) is the backup. If you use this command to change the master, and then restart the chassis software for any reason, the master reverts to the default setting. To change the default master SFM, include the <b>sfm</b> statement at the <b>[edit chassis redundancy]</b> hierarchy level in the configuration. For more information, see the <i>Junos OS Administration Library</i>.</p> <p>All installed SFMs are always working together to forward packets. If an SFM fails, the other SFMs take over and traffic continues to flow uninterrupted.</p>
<b>Required Privilege Level</b>	maintenance
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">show chassis sfm on page 2121</a></li> <li>• <i>Switching the Global Master and Backup Roles in a Virtual Chassis Configuration</i></li> </ul>
<b>List of Sample Output</b>	<a href="#">request chassis sfm master switch on page 895</a> <a href="#">request chassis sfm master switch no-confirm on page 896</a>
<b>Output Fields</b>	When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### request chassis sfm master switch

```

user@host> request chassis sfm master switch

warning: Traffic will be interrupted while the PFE is re-initialized
Toggle mastership between system forwarding module? [yes,no] (no) yes

Switch initiated, use "show chassis sfm" to verify

```

#### request chassis sfm master switch no-confirm

```
user@host> request chassis sfm master switch no-confirm
```

```
Switch initiated, use "show chassis sfm" to verify
```

## request chassis sfm

<b>Syntax</b>	<code>request chassis sfm (offline   online   restart) slot <i>slot-number</i></code>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	(M40e and M160 routers only) Control the operation of the specified Switching and Forwarding Module (SFM).
<b>Options</b>	<p><b>offline</b>—Take the SFM offline.</p> <p><b>online</b>—Bring the SFM online.</p> <p><b>restart</b>—Restart the SFM.</p> <p><b>slot <i>slot-number</i></b>—SFM slot number. Replace <i>slot-number</i> with a value from 0 through 3.</p>
<b>Required Privilege Level</b>	maintenance
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">show chassis sfm on page 2121</a></li> <li>• <i>Configuring SFM Redundancy on M40e and M160 Routers</i></li> <li>• <i>M40e Switching and Forwarding Module (SFM) Description</i></li> </ul>
<b>List of Sample Output</b>	<a href="#">request chassis sfm (M40e) on page 897</a> <a href="#">request chassis sfm (M160) on page 897</a>
<b>Output Fields</b>	When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### request chassis sfm (M40e)

```
user@host> request chassis sfm slot 1 restart
M40e router:
error: SFM 0 is transitioning to online state.
```

### request chassis sfm (M160)

```
user@host> request chassis sfm slot 1 restart
M160 router:
Restart initiated, use "show chassis sfm" to verify
```

## request chassis sib

<b>List of Syntax</b>	<a href="#">Syntax on page 898</a> <a href="#">Syntax (TX Matrix Router) on page 898</a> <a href="#">Syntax (TX Matrix Plus Router) on page 898</a>
<b>Syntax</b>	<code>request chassis sib (offline   online) slot <i>slot-number</i></code>
<b>Syntax (TX Matrix Router)</b>	<code>request chassis sib (all-chassis   lcc <i>number</i>   scc) (offline   online) slot <i>slot-number</i> (start-receiver <i>number</i>   stop-receiver <i>number</i>)</code>
<b>Syntax (TX Matrix Plus Router)</b>	<code>request chassis sib (all-lcc   f13 <i>slot-number</i>   f2s <i>sib-slot/sib-f2s-slot-number</i>   lcc <i>number</i>   (offline   online) slot <i>slot-number</i>)</code>
<b>Release Information</b>	<p>Command introduced before Junos OS Release 7.4.</p> <p><b>f13</b> and <b>f2s</b> options for the TX Matrix Plus router introduced in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 17.2 for PTX10008 Routers.</p>
<b>Description</b>	(M320 routers and T Series routers only) Control the operation of the specified Switch Interface Board (SIB).
<b>Options</b>	<p><b>all-chassis</b>—(TX Matrix routers only) Control the status of the specified SIB.</p> <p><b>all-lcc</b>—(TX Matrix Plus router only) On TX Matrix Plus router, control the operation of the SIB on all routers connected to the TX Matrix Plus router.</p> <p><b>f13 <i>slot-number</i></b>—Control the operation of F13 SIBs. Replace <i>slot-number</i> with a value <b>0</b>, <b>1</b>, <b>3</b>, <b>4</b>, <b>6</b>, <b>7</b>, <b>8</b>, <b>9</b>, <b>11</b>, or <b>12</b>.</p> <p><b>f2s <i>sib-slot/sib-f2s-slot-number</i></b>—(TX Matrix Plus routers only) (Optional) Control the operation of the SIB F2s. Replace <i>sib-slot</i> with a value from <b>0</b> through <b>4</b>, followed by a <i>sib-f2s-slot-number</i> value <b>0</b>, <b>2</b>, <b>4</b> or <b>6</b>.</p> <p><b>lcc <i>number</i></b>—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.</p> <p>Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> <li>0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.</li> <li>0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.</li> </ul>

- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**scc**—(TX Matrix router only) TX Matrix router (switch-card chassis) on a routing matrix.

**offline**—Take the SIB offline.



**NOTE:** In PTX Series (PTX3000 and PTX5000) and T Series (T640 and T1600) Routers with active PFE interfaces, when the last SIB is taken offline, a message displays that if no SIB is brought online within 10 seconds, the system will take action to address the fabric black hole condition. Taking all SIBs offline in these PTX Series or T Series Routers with active PFE interfaces results in traffic black hole condition, and the software takes action to rectify this condition if it persists for more than 10 seconds. If these routers do not have active PFE interfaces, taking all SIBs offline does not result in black hole condition, and the message is not displayed when the last active SIB is taken offline. For details on black hole condition, see [“Fabric Resiliency and Degradation” on page 132](#).

**online**—Bring the SIB online.

**slot *slot-number***—SIB slot number. For the T320 router, replace *slot-number* with a value from 0 through 2. For the T640 router, TX Matrix router, and T1600 router in a routing matrix, replace *slot-number* with a value from 0 through 4.

**start-receiver *number***—(TX Matrix routers only) Start the SIB optical receiver. Replace *number* with a value from 0 through 3.

**stop-receiver *number***—(TX Matrix routers only) Stop the SIB optical receiver. Replace *number* with a value from 0 through 3.

**Required Privilege Level** maintenance

**Related Documentation**

- [show chassis sibs on page 2124](#)
- [show chassis environment sib on page 1271](#)
- [Configuring Junos OS to Upgrade and Downgrade Switch Interface Boards on a TX Matrix Router on page 379](#)
- [M320 SIB Description](#)

**List of Sample Output** [request chassis sib on page 900](#)

[request chassis sib on page 900](#)

**Output Fields** When you enter this command, you are provided feedback on the status of your request.

## Sample Output

[request chassis sib](#)

```
user@host> request chassis sib slot 0 online
Online initiated, use "show chassis sibs" to verify
```

[request chassis sib](#)

```
user@host> request chassis sib f13 slot 0 offline
Offline initiated, use "show chassis sibs" to verify
```

## request chassis sib f13 train-link-receive slot

<b>List of Syntax</b>	<a href="#">Syntax on page 901</a> <a href="#">Syntax (TX Matrix Plus Router) on page 901</a>
<b>Syntax</b>	<code>request chassis sib f13 train-link-receive slot <i>SFC-SIB-F13-slot-num</i></code>
<b>Syntax (TX Matrix Plus Router)</b>	<code>request chassis sib f13 train-link-receive slot <i>SFC-SIB-F13-slot-num</i></code>
<b>Release Information</b>	Command introduced in Junos OS Release 10.1.
<b>Description</b>	(TX Matrix Plus router only) Control the receiving link of the specified Switch Interface Board (SIB) of the SFC.
<b>Options</b>	<code>slot <i>SFC-SIB-F13-slot-num</i></code> — SFC SIB slot number. Replace it with 0, 3, 6, 8 or 11.
<b>Required Privilege Level</b>	maintenance
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">request chassis sib f13 train-link-transmit slot on page 902</a></li> <li>• <a href="#">Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 407</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">request chassis sib f13 train-link-receive slot on page 901</a>
<b>Output Fields</b>	When you enter this command, the SFC is ready to receive traffic from the T1600 or T4000 router (LCC).

## Sample Output

### request chassis sib f13 train-link-receive slot

```
user@host> request chassis sib f13 train-link-receive slot 0
```

## request chassis sib f13 train-link-transmit slot

---

<b>Syntax</b>	<code>request chassis sib f13 train-link-transmit slot <i>SFC-SIB-F13-slot-num</i></code>
<b>Release Information</b>	Command introduced in Junos OS Release 10.1.
<b>Description</b>	(TX Matrix Plus router only) Control the transmission link of the specified Switch Interface Board (SIB) of the SFC.
<b>Options</b>	<b>slot</b> <i>SFC-SIB-F13-slot-num</i> —SFC SIB slot number. Replace it with 0, 3, 6, 8 or 11.
<b>Required Privilege Level</b>	maintenance
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">request chassis sib f13 train-link-receive slot on page 901</a></li><li>• <a href="#">Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 407</a></li></ul>
<b>List of Sample Output</b>	<a href="#">request chassis sib f13 train-link-transmit slot on page 902</a>
<b>Output Fields</b>	When you enter this command, the SFC is ready to transmit traffic to the T1600 or T4000 router (LCC).

## Sample Output

### request chassis sib f13 train-link-transmit slot

```
user@host> request chassis sib f13 train-link-transmit slot 0
```



## request chassis sib optics lcc

<b>Syntax</b>	<code>request chassis sib optics lcc <i>number</i> sib-slot <i>number</i> optics-slot <i>number</i> ( enable   disable)</code>
<b>Release Information</b>	Command introduced in Junos OS Release 13.1 for TX Matrix Routers with 3D SIBs.
<b>Description</b>	(TX Matrix Plus routers with 3D SIBs only) Control the operation of the high-speed links on the LCCs by enabling or disabling the high-speed links.
<b>Options</b>	<p><b>lcc <i>number</i></b>—Line-card chassis number. Replace the <i>number</i> with the following values depending on the LCC configuration.</p> <ul style="list-style-type: none"> <li>0 through 7, T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> <li>0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> </ul> <p><b>sib-slot <i>number</i></b>—SIB slot number. Replace the <i>number</i> with a value from 0 to 15.</p> <p><b>optics-slot <i>number</i></b>—Optics slot number for high-speed link cable. Replace the <i>number</i> with a value from 0 to 15.</p> <p><b>enable</b>—Start the high-speed linkss on the cables and enable the FPCs.</p> <p><b>disable</b>—Disable the FPCs and stop the high-speed links on the cables.</p>
<b>Required Privilege Level</b>	maintenance
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><i>show chassis fabric optical-links</i></li> </ul>
<b>List of Sample Output</b>	<a href="#">request chassis sib optics lcc on page 903</a> <a href="#">request chassis sib optics lcc on page 904</a>
<b>Output Fields</b>	When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### request chassis sib optics lcc

```
user@host> request chassis sib optics lcc 7 optics-slot 6 sib-slot 6 enable
Optics 6 enable initiated, use "show chassis fabric optical-links detail" to
verify
```

### request chassis sib optics lcc

```
user@host> request chassis sib optics lcc 7 optics-slot 6 sib-slot 6 disable
```

```
Optics 6 disable initiated, use "show chassis fabric optical-links detail" to  
verify
```

## request chassis sib optics sfc

<b>Syntax</b>	<code>request chassis sib optics sfc <i>slot-number</i> sib-slot <i>number</i> optics-slot <i>number</i> ( enable   disable )</code>
<b>Release Information</b>	Command introduced in Junos OS Release 13.1 for TX Matrix Routers with 3D SIBs.
<b>Description</b>	(TX Matrix Plus routers with 3D SIBs only) Control the operation of the high-speed links on the SIBs by enabling or disabling the high-speed links.
<b>Options</b>	<p><b>sfc <i>slot-number</i></b>—SFC slot number. Replace the <i>slot-number</i> with 0.</p> <p><b>sib-slot <i>number</i></b>—SIBslot number. Replace the <i>number</i> with a value from 0 to 15.</p> <p><b>optics-slot <i>number</i></b>—Optics slot number for high-speed link cable. Replace the <i>number</i> with a value from 0 to 15.</p> <p><b>enable</b>—Start the high-speed links on the cables and enable the FPCs.</p> <p><b>disable</b>—Disable the FPCs and stop the HSLs on the cables.</p>
<b>Required Privilege Level</b>	maintenance
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><a href="#">show chassis fabric optical-links</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">request chassis sib optics sfc on page 905</a> <a href="#">request chassis sib optics sfc on page 905</a>
<b>Output Fields</b>	When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### request chassis sib optics sfc

```
user@host> request chassis sib optics sfc 0 optics-slot 6 sib-slot 6 enable
Optics 6 enable initiated, use "show chassis fabric optical-links detail" to
verify
```

### request chassis sib optics sfc

```
user@host> request chassis sib optics sfc 0 optics-slot 6 sib-slot 6 disable
Optics 6 disable initiated, use "show chassis fabric optical-links detail" to
verify
```

## request chassis sib train-link-receive slot

---

<b>Syntax</b>	<code>request chassis sib train-link-receive slot <i>LCC-SIB-ST-SIB-L-slot-num</i></code>
<b>Release Information</b>	Command introduced in Junos OS Release 10.1.
<b>Description</b>	(T1600 Router (LCC), T4000 Router (LCC), and TX Matrix Plus router only) Control the receiving link of the specified Switch Interface Board (SIB) of the LCC.
<b>Options</b>	<b>slot</b> <i>LCC-SIB-ST-SIB-L-slot-num</i> — LCC SIB slot number. Replace it with a value from 0 through 4.
<b>Required Privilege Level</b>	maintenance
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">request chassis sib train-link-transmit slot on page 907</a></li><li>• <a href="#">Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 407</a></li></ul>
<b>List of Sample Output</b>	<a href="#">request chassis sib train-link-receive slot on page 906</a>
<b>Output Fields</b>	When you enter this command, the LCC is ready to receive traffic from the SFC.

## Sample Output

### request chassis sib train-link-receive slot

```
user@host> request chassis sib train-link-receive slot 0
```

## request chassis sib train-link-transmit slot

<b>List of Syntax</b>	<a href="#">Syntax on page 907</a> <a href="#">Syntax (TX Matrix Plus Routing Platform) on page 907</a>
<b>Syntax</b>	<code>request chassis sib train-link-transmit slot <i>LCC-SIB-ST-SIB-L-slot-num</i></code>
<b>Syntax (TX Matrix Plus Routing Platform)</b>	<code>request chassis sib train-link-receive slot <i>LCC-SIB-ST-SIB-L-slot-num</i></code>
<b>Release Information</b>	Command introduced in Junos OS Release 10.1.
<b>Description</b>	(T1600 Router (LCC), T4000 (LCC) and TX Matrix Plus router only) Control the transmission link of the specified Switch Interface Board (SIB) of the LCC.
<b>Options</b>	<b>slot</b> <i>LCC-SIB-ST-SIB-L-slot-num</i> — LCC SIB slot number. Replace it with a value from 0 through 4.
<b>Required Privilege Level</b>	maintenance
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><a href="#">request chassis sib train-link-receive slot on page 906</a></li> <li><a href="#">Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 407</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">request chassis sib train-link-transmit slot on page 907</a>
<b>Output Fields</b>	When you enter this command, the LCC is ready to transmit traffic to the SFC.

## Sample Output

### request chassis sib train-link-transmit slot

```
user@host> request chassis sib train-link-transmit slot 0
```

## request chassis spmb restart

<b>List of Syntax</b>	<a href="#">Syntax on page 908</a> <a href="#">Syntax (MX2020, MX2010, and 2008 Routers) on page 908</a> <a href="#">Syntax (TX Matrix Router) on page 908</a> <a href="#">Syntax (TX Matrix Plus Router) on page 908</a>
<b>Syntax</b>	<code>request chassis spmb restart slot <i>slot-number</i></code>
<b>Syntax (MX2020, MX2010, and 2008 Routers)</b>	<code>request chassis spmb restart slot <i>slot-number</i></code> <code>&lt;all-members&gt;</code> <code>&lt;local&gt;</code> <code>&lt;member <i>member-id</i>&gt;</code>
<b>Syntax (TX Matrix Router)</b>	<code>request chassis spmb restart (lcc <i>number</i>   scc) slot <i>slot-number</i></code>
<b>Syntax (TX Matrix Plus Router)</b>	<code>request chassis spmb restart (lcc <i>number</i>   sfc <i>number</i>) slot <i>slot-number</i></code>
<b>Release Information</b>	<p>Command introduced before Junos OS Release 7.4.</p> <p><b>sfc</b> option for the TX Matrix Plus router introduced in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.</p> <p><b>all-members</b>, <b>local</b>, and <b>member <i>member-id</i></b> options introduced in Junos OS Release 15.1 for MX2020 and MX2010 routers.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.2 for PTX10008 Routers.</p>
<b>Description</b>	Restart the specified Switch Processor Mezzanine Board (SPMB) on the Control Board (CB).
<b>Options</b>	<p><b>all-members</b>—(MX2010, MX2020, and MX2008 routers only) (Optional) Restart the SPMB on the CB in all members of the Virtual Chassis configuration.</p> <p><b>lcc <i>number</i></b>—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.</p> <p>Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> <li>0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.</li> <li>0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.</li> </ul>

- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX2010, MX2020, and MX2008 routers only) (Optional) Restart the SPMB on the CB in the local Virtual Chassis member.

**member *member-id***—(MX2010, MX2020, and MX2008 routers only) (Optional) Restart the SPMB on the CB in the specified member of the Virtual Chassis. Replace *member-id* with the value 0 or 1.

**scc**—(TX Matrix routers only) TX Matrix router (switch-card chassis) in the routing matrix.

**sfc *number***—(TX Matrix Plus routers only) The switch-fabric chassis number of the TX Matrix Plus router. Replace the *number* variable with a value 0.

**slot *slot-number***—The SPMB slot number. Replace *slot-number* with 0 or 1.

**Required Privilege Level** maintenance

**Related Documentation**

- [show chassis spmb on page 2136](#)
- [show chassis spmb sibs on page 2147](#)

**List of Sample Output**

- [request chassis spmb restart on page 909](#)
- [request chassis spmb restart \(MX2010 Router\) on page 909](#)
- [request chassis spmb restart \(MX2008 Router\) on page 909](#)

**Output Fields** When you enter this command, you are provided feedback on the status of your request.

## Sample Output

### request chassis spmb restart

```
user@host> request chassis spmb restart slot 0
```

### request chassis spmb restart (MX2010 Router)

```
user@host> request chassis spmb restart slot 0
Restart initiated, use "show chassis spmb" to verify
```

### request chassis spmb restart (MX2008 Router)

```
user@host>request chassis spmb restart slot 0
Restart initiated, use "show chassis spmb" to verify
```

## request chassis synchronization mode

---

<b>Syntax</b>	<code>request chassis synchronization mode (free-run   holdover   auto-select)</code>
<b>Release Information</b>	Command introduced in Junos OS Release 11.2R4 for MX Series 5G Universal Routing Platforms.
<b>Description</b>	(MX5-T, MX10-T, MX40-T, MX80, MX80-T, MX240, MX480, and MX960 routers only) Change the chassis synchronization source used for Synchronous Ethernet configuration.
<b>Options</b>	<b>freerun</b> —Change chassis synchronization to free-run mode. <b>holdover</b> —Change chassis synchronization to holdover mode. <b>auto-select</b> —Change chassis synchronization to auto-select mode.
<b>Required Privilege Level</b>	maintenance
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Synchronous Ethernet Overview on page 242</a></li><li>• <a href="#">Configuring an External Clock Synchronization Interface for MX Series Routers on page 293</a></li></ul>
<b>List of Sample Output</b>	<a href="#">request chassis synchronization mode freerun on page 910</a> <a href="#">request chassis synchronization mode holdover on page 910</a> <a href="#">request chassis synchronization mode auto-select on page 911</a>
<b>Output Fields</b>	When you enter this command, the current status of your request is displayed. <ul style="list-style-type: none"><li>• <b>Not configured</b>—Indicates that the source is not configured.</li><li>• <b>Present</b>—Indicates that the source is configured and present.</li><li>• <b>Qualified</b>—Indicates that the source is being used for synchronization.</li></ul>

### Sample Output

#### request chassis synchronization mode freerun

```
user@host> request chassis synchronization mode freerun
mode is freerun, status: qualified
```

### Sample Output

#### request chassis synchronization mode holdover

```
user@host> request chassis synchronization mode holdover
```



```
mode is holdover, status: qualified
```

## Sample Output

**request chassis synchronization mode auto-select**

```
user@host> request chassis synchronization mode auto-select  
mode is auto-select, status: qualified
```

## request chassis synchronization switch

**List of Syntax**    [Syntax on page 912](#)  
                          [Syntax \(M Series, T Series\) on page 912](#)  
                          [Syntax \(PTX Series\) on page 912](#)

**Syntax**    request chassis synchronization switch

**Syntax (M Series, T Series)**    request chassis synchronization switch (external-a | external-b)

**Syntax (PTX Series)**    request chassis synchronization switch (bits-a | bits-b | fpc-slot-number | gps-0 | gps-1 )

**Release Information**    Command introduced in Junos OS Release 7.6.  
                          Command introduced in Junos OS Release 8.3 for M40e routers.  
                          Command introduced in Junos OS Release 9.3 for M120 routers.  
                          Command introduced in Junos OS Release 10.2 for T320, T640, and T1600 routers.  
                          Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Routers.  
                          Command introduced in Junos OS Release 17.2 for PTX10008 Routers.

**Description**    (M320, M40e, M120, T320, T640, and T1600 routers and PTX Packet Transport Routers only) Change the external clock source used for chassis synchronization.

**Options**    **external-a**—(Routing matrix only) Change the synchronization source to external source A.

**external-b**—(Routing matrix only) Change the synchronization source to external source B.

**bits-a**—(PTX Series only) Change the synchronization source to the BITS external source A.

**bits-b**—(PTX Series only) Change the synchronization source to the BITS external source B.

**fpc-slot-number**—(PTX Series only) Change the synchronization source to an FPC in the slot specified. For the PTX5000 Packet Transport Router, replace *slot-number* with a value from 0 through 7.

**gps-0-10mhz**—(PTX Series only) Change the synchronization source to the 10 MHz GPS source on CCG port 0.

**gps-0-5mhz**—(PTX Series only) Change the synchronization source to the 5 MHz GPS source on CCG port 0.

**gps-1-10mhz**—(PTX Series only) Change the synchronization source to the 10 MHz GPS source on CCG port 1.

**gps-1-5mhz**—(PTX Series only) Change the synchronization source to the 5 MHz GPS source on CCG port 1.

**Required Privilege Level** maintenance

**Related Documentation**

- [show chassis synchronization on page 2153](#)
- [Configuring Clock Synchronization Interface on MX Series Routers on page 293](#)
- [Supported Time Synchronization Standard](#)

**List of Sample Output** [request chassis synchronization switch \(M Series, T Series\) on page 913](#)  
[request chassis synchronization switch \(PTX Series\) on page 913](#)

**Output Fields** When you enter this command, you are provided feedback on the status of your request. **Not configured** indicates that the source is not configured. **Present** indicates that the source is configured and present. **Qualified** indicates that the source is being used for synchronization.

## Sample Output


### [request chassis synchronization switch \(M Series, T Series\)](#)

```
user@host> request chassis synchronization switch external-a
switching to external-a, status: qualified
```

### [request chassis synchronization switch \(PTX Series\)](#)

```
user@host> request chassis synchronization switch fpc-2
switching to fpc-2, status: qualified
```

## set chassis display message

<b>List of Syntax</b>	<a href="#">Syntax on page 914</a> <a href="#">Syntax (TX Matrix Router) on page 914</a> <a href="#">Syntax (TX Matrix Plus Router) on page 914</a>
<b>Syntax</b>	<pre>set chassis display message "message" &lt;permanent&gt;</pre>
<b>Syntax (TX Matrix Router)</b>	<pre>set chassis display message "message" (lcc number   scc) &lt;permanent&gt;</pre>
<b>Syntax (TX Matrix Plus Router)</b>	<pre>set chassis display message "message" (fpc-slot slot-number   lcc number   sfc number) &lt;permanent&gt;</pre>
<b>Release Information</b>	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p><b>sfc</b> option for TX Matrix Plus router introduced in Junos OS Release 9.6.</p>
<b>Description</b>	<p>Display or stop a text message on the craft interface display, which is on the front of the router, or on the LCD panel display on the switch. The craft interface alternates the display of text messages with standard craft interface messages three times, switching between messages every 60 seconds.</p>
	<p> <b>NOTE:</b> On T Series routers, when this command is executed with the <b>permanent</b> option, the display of the text message alternates with that of the standard craft interface message continuously every 60 seconds.</p>
	<p>By default, on both the router and the switch, the text message is displayed for 5 minutes. The craft interface display has four 20-character lines. The LCD panel display has two 16-character lines, and text messages appear only on the second line.</p>
<b>Options</b>	<p><b>"message"</b>—Message to display. On the craft interface display, if the message is longer than 20 characters, it wraps onto the next line. If a word does not fit on one line, the entire word moves down to the next line. Any portion of the message that does not fit on the display is truncated. An empty pair of quotation marks (" ") deletes the text message from the craft interface display. On the LCD panel display, the message is limited to 16 characters.</p> <p><b>fpc-slot slot-number</b>—(TX Matrix Plus routers and EX4200 and QFX Series only) On the router or switch, display the text message on the craft interface for a specific Flexible PIC Concentrator (FPC). Replace <b>slot-number</b> with a value from <b>0</b> through <b>31</b>. On the switch, display the text message for a specific member of a Virtual Chassis, where</p>

**fpc-slot** *slot-number* corresponds to the member ID. Replace *slot-number* with a value from 0 through 9. On the QFX Series, the *slot-number* is always 0. On a TX Matrix Plus router with 3D SIBs replace *slot-number* with a value from 0 through 63.

**lcc number**—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**permanent**—(Optional) Display a text message on the craft interface display or LCD panel display permanently.

**scc**—(TX Matrix routers only) Display the text message on the craft interface display of the TX Matrix router (switch-card chassis).

**sfc number**—(TX Matrix Plus routers only) Display the text message on the craft interface display of the TX Matrix Plus router (or switch-fabric chassis).

**Required Privilege Level** clear

**Related Documentation**

- [Configuring the LCD Panel on EX Series Switches \(CLI Procedure\)](#)
- [clear chassis display message on page 833](#)
- [show chassis craft-interface on page 950](#)

**List of Sample Output** [set chassis display message \(Creating\) on page 915](#)  
[set chassis display message \(Deleting\) on page 916](#)

**Output Fields** See [show chassis craft-interface](#) for an explanation of output fields.

## Sample Output

### set chassis display message (Creating)

The following example shows how to set the display message and verify the result:

```
user@host> set chassis display message "NOC contact Dusty (888) 555-1234"
```

```
message sent
```

```
user@host> show chassis craft-interface
```

```
Red alarm:    LED off, relay off
Yellow alarm: LED off, relay off
Host OK LED:  On
Host fail LED: Off
FPCs         0 1 2 3 4 5 6 7
```

```
-----
Green .. *.. * *.
Red      .....
```

```
LCD screen:
```

```
+-----+
|NOC contact Dusty |
|(888) 555-1234    |
+-----+
```

### set chassis display message (Deleting)

The following example shows how to delete the display message and verify that the message is removed:

```
user@host> set chassis display message ""
```

```
message sent
```

```
user@host> show chassis craft-interface
```

```
Red alarm:    LED off, relay off
Yellow alarm: LED off, relay off
Host OK LED:  On
Host fail LED: Off
FPCs         0 1 2 3 4 5 6 7
```

```
-----
Green .. *.. * *.
Red      .....
```

```
LCD screen:
```

```
+-----+
|host      |
|Up: 0+17:05:47|
|          |
|Temperature OK|
+-----+
```

## CHAPTER 28

# Monitoring Commands

- `show chassis adc`
- `show chassis afeb`
- `show chassis alarms`
- `show chassis cfeb`
- `show chassis cip`
- `show chassis craft-interface`
- `show chassis environment`
- `show chassis environment adc`
- `show chassis environment cb`
- `show chassis environment ccg`
- `show chassis environment fan`
- `show chassis environment fpc`
- `show chassis environment fpm`
- `show chassis environment monitored`
- `show chassis environment mcs`
- `show chassis environment monitored`
- `show chassis environment pcg`
- `show chassis environment pdu`
- `show chassis environment pem`
- `show chassis environment psu`
- `show chassis environment psm`
- `show chassis environment routing-engine`
- `show chassis environment scg`
- `show chassis environment sfb`
- `show chassis environment sfm`
- `show chassis environment sib`
- `show chassis ethernet-switch`
- `show chassis fan`

- `show chassis fabric degraded-fabric-reachability`
- `show chassis fabric destinations`
- `show chassis fabric faults recovery-actions`
- `show chassis fabric feb`
- `show chassis fabric errors`
- `show chassis fabric fpcs`
- `show chassis fabric map`
- `show chassis fabric optics`
- `show chassis fabric plane`
- `show chassis fabric plane-location`
- `show chassis fabric redundancy-mode`
- `show chassis fabric reachability`
- `show chassis fabric sibs`
- `show chassis fabric summary`
- `show chassis fabric topology`
- `show chassis fabric unreachable-destinations`
- `show chassis fan`
- `show chassis feb`
- `show chassis firmware`
- `show chassis forwarding`
- `show chassis fpc`
- `show chassis fpc errors`
- `show chassis fpc-feb-connectivity`
- `show chassis hardware`
- `show chassis in-service-upgrade`
- `show chassis lccs`
- `show chassis lcc-mode`
- `show chassis location`
- `show chassis mac-addresses`
- `show chassis network-services`
- `show chassis oss-map`
- `show chassis pic`
- `show chassis power`
- `show chassis power sequence`
- `show chassis psd`
- `show chassis redundancy feb`
- `show chassis routing-engine`



- `show chassis scb`
- `show chassis sfb`
- `show chassis sfb errors`
- `show chassis sfm`
- `show chassis sibs`
- `show chassis spmb`
- `show chassis spmb sibs`
- `show chassis synchronization`
- `show chassis synchronization (MX Series Routers)`
- `show chassis temperature-thresholds`
- `show chassis zones (PTX Series Packet Transport Routers)`
- `show chassis zones`
- `show pfe cfeb`
- `show pfe feb`
- `show pfe fpc`
- `show fib-local-accounting ip`
- `show ptp aggregated-ethernet interfaces`
- `show ptp clock`
- `show ptp hybrid`
- `show ptp lock-status`
- `show ptp master`
- `show ptp path-trace detail`
- `show ptp phy-timestamping-interfaces`
- `show ptp port`
- `show ptp slave`
- `show ptp stateful detail`
- `show synchronous-ethernet esmc statistics`
- `show synchronous-ethernet esmc transmit`
- `show synchronous-ethernet global-information`

## show chassis adc

<b>Syntax</b>	<pre>show chassis adc &lt;all-members&gt; &lt;local&gt; &lt;member <i>member-id</i>&gt;</pre>
<b>Release Information</b>	<p>Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms. Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms. <b>all-members</b>, <b>local</b>, and <b>member <i>member-id</i></b> options introduced in Junos OS Release 15.1 for MX2020 and MX2010 routers.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p>
<b>Description</b>	Display chassis information about the adapter cards (ADCs).
<b>Options</b>	<p><b>none</b>—Display information about all adapter cards.</p> <p><b>all-members</b>—(Optional) Display information about the adapter cards (ADCs) in all members of the Virtual Chassis configuration.</p> <p><b>local</b>—(Optional) Display information about the ADCs in the local member of the Virtual Chassis.</p> <p><b>member <i>member-id</i></b>—(Optional) Display information about the ADCs in the specified member of the Virtual Chassis. Replace <b><i>member-id</i></b> with the value 0 or 1.</p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><a href="#">show chassis environment adc on page 1054</a></li> </ul>
<b>List of Sample Output</b>	<p><a href="#">show chassis adc (MX2020 Router) on page 921</a></p> <p><a href="#">show chassis adc (MX2010 Router) on page 921</a></p> <p><a href="#">show chassis adc (MX2008 Router) on page 922</a></p> <p><a href="#">show chassis adc (Node Slicing) on page 922</a></p>
<b>Output Fields</b>	Table 91 on page 920 lists the output fields for the <b>show chassis adc</b> command. Output fields are listed in the approximate order in which they appear.

Table 91: show chassis adc Output Fields

Field Name	Field Description
Slot	Slot number.

Table 91: show chassis adc Output Fields (continued)

Field Name	Field Description
<b>State</b>	Status of the adapter card. <ul style="list-style-type: none"> <li>• <b>Online</b>—The adapter card is online and running.</li> <li>• <b>Offline</b>—Adapter card is powered down.</li> </ul>
<b>Uptime</b>	How long the Routing Engine has been connected to the adapter card and, therefore, how long the adapter card has been up and running.
<b>GNF (Node slicing)</b>	GNF identifier for each ADC.

## Sample Output

### show chassis adc (MX2020 Router)

```
user@host> show chassis adc
```

Slot	State	Uptime
0	Online	1 hour, 21 minutes, 7 seconds
1	Online	1 hour, 21 minutes, 3 seconds
2	Online	1 hour, 20 minutes, 59 seconds
3	Online	1 hour, 20 minutes, 54 seconds
4	Online	1 hour, 20 minutes, 50 seconds
5	Online	1 hour, 20 minutes, 46 seconds
6	Online	1 hour, 20 minutes, 42 seconds
7	Online	1 hour, 20 minutes, 37 seconds
8	Online	1 hour, 20 minutes, 33 seconds
9	Online	1 hour, 20 minutes, 28 seconds
10	Online	1 hour, 20 minutes, 24 seconds
11	Online	1 hour, 20 minutes, 19 seconds
12	Online	1 hour, 20 minutes, 15 seconds
13	Online	1 hour, 20 minutes, 8 seconds
14	Online	1 hour, 20 minutes, 4 seconds
15	Online	1 hour, 19 minutes, 59 seconds
16	Online	1 hour, 19 minutes, 55 seconds
17	Online	1 hour, 19 minutes, 50 seconds
18	Online	1 hour, 19 minutes, 45 seconds
19	Online	1 hour, 19 minutes, 39 seconds

### show chassis adc (MX2010 Router)

```
user@host > show chassis adc
```

Slot	State	Uptime
0	Online	12 hours, 17 minutes, 38 seconds
1	Online	12 hours, 17 minutes, 30 seconds
2	Online	12 hours, 17 minutes, 22 seconds
3	Online	12 hours, 17 minutes, 14 seconds
4	Online	12 hours, 17 minutes, 6 seconds
5	Online	12 hours, 16 minutes, 58 seconds
6	Online	12 hours, 16 minutes, 49 seconds
7	Online	12 hours, 16 minutes, 41 seconds
8	Online	12 hours, 16 minutes, 33 seconds
9	Online	12 hours, 16 minutes, 25 seconds

### show chassis adc (MX2008 Router)

```
user@host > show chassis adc
```

Slot	State	Uptime
0	Empty --- Native line card ---	
1	Empty --- Native line card ---	
2	Empty	
3	Empty	
4	Empty	
5	Empty	
6	Empty	
7	Online 1 hour, 14 minutes, 32 seconds	
8	Empty	
9	Empty	

### show chassis adc (Node Slicing)

```
user@router> show chassis adc
```

Slot	State	Uptime	GNF
0	Online	12 hours, 57 minutes, 46 seconds	3
1	Empty	--- Native line card ---	2
2	Online	12 hours, 57 minutes, 18 seconds	3
3	Online	11 minutes, 23 seconds	6
4	Empty	--- Native line card ---	6
5	Empty	--- Native line card ---	4
6	Online	13 hours, 38 minutes, 58 seconds	1
7	Online	13 hours, 3 minutes, 40 seconds	5
8	Empty	--- Native line card ---	5
9	Empty	--- Native line card ---	5

## show chassis afeb

<b>Syntax</b>	show chassis afeb
<b>Release Information</b>	Command introduced in Junos OS Release 13.2.
<b>Description</b>	Display compact Forwarding Engine Board status.
<b>Options</b>	This command has no options.
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">request chassis afeb on page 839</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">show chassis afeb (MX104 Router) on page 924</a>
<b>Output Fields</b>	<a href="#">Table 92 on page 923</a> lists the output fields for the <b>show chassis afeb</b> command. Output fields are listed in the approximate order in which they appear.

Table 92: show chassis afeb

Field Name	Field Description
<b>State</b>	State of the compact Forwarding Engine Board: <ul style="list-style-type: none"> <li>• <b>Offline</b>—FEB is powered down.</li> <li>• <b>Online</b>—FEB is operational and running.</li> <li>• <b>Check</b>—FEB is in alarmed state because of the following reasons:               <ul style="list-style-type: none"> <li>• Hardware error.</li> <li>• PFE is unable to boot.</li> </ul> </li> </ul>
<b>Temperature</b>	Temperature of the air passing by the FEB, in degrees Celsius or in both degrees Celsius and degrees Fahrenheit.
<b>CPU Utilization</b>	Total percentage of CPU being used.
<b>Interrupt Utilization</b>	Of the total CPU being used by the FEB processor, the percentage being used for interrupts.
<b>Heap Utilization</b>	Percentage of heap space (dynamic memory) being used by the FEB processor. If this number exceeds 80 percent, you might experience a software problem (memory leak).
<b>Buffer Utilization</b>	Percentage of buffer space being used by the FEB processor for buffering internal messages.
<b>Total CPU DRAM</b>	Total DRAM, in megabytes, available to the FEB processor.
<b>Start time</b>	Time when the Routing Engine detected that the FEB was running.

*Table 92: show chassis afeb (continued)*

Field Name	Field Description
<b>Uptime</b>	How long the Routing Engine has been connected to the FEB and, therefore, how long the compact Forwarding Engine Board has been up and running.

---

## Sample Output

### show chassis afeb (MX104 Router)

```
user@host> show chassis afeb
FEB status:
Slot 0 information:
  State                Online
  Temperature          31 degrees C / 87 degrees F
  CPU utilization       3 percent
  Interrupt utilization 0 percent
  Heap utilization      11 percent
  Buffer utilization     13 percent
  Total CPU DRAM        2048 MB
  Start time:           2013-05-27 08:50:03 IST
  Uptime:               3 hours, 29 minutes, 34 seconds
```

## show chassis alarms

**List of Syntax**    [Syntax on page 925](#)  
                           [Syntax \(TX Matrix Routers\) on page 925](#)  
                           [Syntax \(TX Matrix Plus Routers\) on page 925](#)  
                           [Syntax \(MX Series Routers\) on page 925](#)  
                           [Syntax \(MX104, MX2010, MX2020, and MX2008 Universal Routing Platforms\) on page 925](#)  
                           [Syntax \(MX10003, MX204, and MX10008\) on page 925](#)  
                           [Syntax \(QFX Series\) on page 925](#)  
                           [Syntax \(OCX Series\) on page 925](#)  
                           [Syntax \(PTX Series Packet Transport Routers\) on page 926](#)  
                           [Syntax \(ACX Series Universal Metro Routers\) on page 926](#)  
                           [Syntax \(EX9251, EX9253 Switches\) on page 926](#)

**Syntax**    show chassis alarms

**Syntax (TX Matrix Routers)**    show chassis alarms  
   <lcc *number* | scc>

**Syntax (TX Matrix Plus Routers)**    show chassis alarms  
   <lcc *number* | sfc *number*>

**Syntax (MX Series Routers)**    show chassis alarms  
   <all-members>  
   <local>  
   <member *member-id*>

**Syntax (MX104, MX2010, MX2020, and MX2008 Universal Routing Platforms)**    show chassis alarms  
   <satellite [slot-id *slot-id*]>

**Syntax (MX10003, MX204, and MX10008)**    show chassis alarms

**Syntax (QFX Series)**    show chassis alarms  
                                   <interconnect-device *name*>  
                                   <node-device *name*>

**Syntax (OCX Series)**    show chassis alarms

Syntax (PTX Series Packet Transport Routers)	show chassis alarms
Syntax (ACX Series Universal Metro Routers)	show chassis alarms
Syntax (EX9251, EX9253 Switches)	show chassis alarms
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p><b>sfc</b> option introduced in Junos OS Release 9.6 for the TX Matrix Plus router.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 12.1 for the PTX Series Packet Transport Routers.</p> <p>Command introduced in Junos OS Release 12.2 for the ACX Series Universal Metro Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX 2010 and MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 13.2 for MX104 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> <p><b>satellite</b> option introduced in Junos OS Release 14.2R3 for Junos Fusion.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.2 for PTX10008 Routers.</p> <p>Command introduced in Junos OS Release 17.3 for MX150 Router Appliance.</p> <p>Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.4 for MX204 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 18.1R1 for EX9251 Switches.</p> <p>Command introduced in Junos OS Release 18.2 for EX9253 Switches.</p> <p>Command introduced in Junos OS Release 18.2R1 for MX10008 Universal Routing Platforms.</p>
Description	Display information about the conditions that have been configured to trigger alarms.
Options	<p><b>none</b>—Display information about the conditions that have been configured to trigger alarms.</p> <p><b>all-members</b>—(MX Series routers only) (Optional) Display information about alarm conditions for all the member routers of the Virtual Chassis configuration.</p> <p><b>interconnect-device <i>name</i></b>—(QFabric systems only) (Optional) Display information about alarm conditions for the Interconnect device.</p> <p><b>lcc <i>number</i></b>—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.</p>



Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers only) (Optional) Display information about alarm conditions for the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Display information about alarm conditions for the specified member of the Virtual Chassis configuration. Replace *member-id* variable with a value of 0 or 1.

**node-device *name***—(QFabric systems only) (Optional) Display information about alarm conditions for the Node device.

**satellite [*slot-id slot-id*]**—(Junos Fusion only) (Optional) Display information about alarm conditions for the specified satellite device in a Junos Fusion, or for all satellite devices in the Junos Fusion if no satellite devices are specified.

**scc**—(TX Matrix router only) (Optional) Show information about the TX Matrix router (switch-card chassis).

**sfc *number***—(TX Matrix Plus router only) (Optional) Show information about the respective TX Matrix Plus router, which is the switch-fabric chassis. Replace *number* variable with 0.

**Additional Information** Chassis alarms are preset. You cannot modify them.

You cannot clear the alarms for chassis components. Instead, you must remedy the cause of the alarm. When a chassis alarm LED is lit, it indicates that you are running the router or switch in a manner that we do not recommend.

On routers, you can manually silence external devices connected to the alarm relay contacts by pressing the alarm cutoff button, located on the craft interface. Silencing the device does not remove the alarm messages from the display (if present on the router) or extinguish the alarm LEDs. In addition, new alarms that occur after you silence an external device reactivate the external device.



**NOTE:** MX10003 routers do not support craft interface.

In Junos OS release 11.1 and later, alarms for fans also show the slot number of the fans in the CLI output.

In Junos OS Release 11.2 and later, the command output on EX8200 switches shows the detailed location (**Plane/FPC/PFE**) for link errors in the chassis.

In Junos OS Release 10.2 and later, an alarm is shown on T Series routers for a standby SONET Clock Generator (SCG) that is offline or absent.

You may often see the following error messages, in which only the error code is shown and no other information is provided:

```
Apr 12 08:04:10 send: red alarm set, device FPC 6, reason FPC 6 Major Errors
- Error code: 257
Apr 12 08:04:19 send: red alarm set, device FPC 1, reason FPC 1 Major Errors
- Error code: 559
```

To understand what CM\_ALARM error codes mean, you need to first identify the structure of the CM Alarm codes. A CM\_ALARM code has the following structure:

Bits:	Error type:
1-31	Major (1)
0	Minor (0)

According to the table above, the LSB (bit 0) identifies the **Error Type** (major alarm, if the bit is set and minor alarm if the bit is unset). The rest of the bits (1 - 31) identify the actual error code.

Take an example of the following error code, which was logged on a T1600:

```
Apr 12 08:04:10 send: red alarm set, device FPC 1, reason FPC 1 Major Errors
- Error code: 559
```

First, you have to convert 559 to binary; that is **1000101111**. The LSB in this case is 1, which means that this is a major alarm. After removing the LSB, you are left with **100010111**, which is equal to 279 in decimal. This is the actual error code, its meaning can be found from the following list:

Chip Type: L Chip	Code
CMALARM_LCHIP_LOUT_DESRD_PARITY_ERR	1
CMALARM_LCHIP_LOUT_DESRD_UNINIT_ERR	2
CMALARM_LCHIP_LOUT_DESRD_ILLEGALLINK_ERR	3
CMALARM_LCHIP_LOUT_DESRD_ILLEGALSZERR	4
CMALARM_LCHIP_LOUT_HDRF_TOERR_ERR	5

CMALARM_LCHIP_LOUT_HDRF_PARITY_ERR	6
CMALARM_LCHIP_LOUT_HDRF_UCERR_ERR	7
CMALARM_LCHIP_LOUT_NLIF_CRCDROP_ERR	8
CMALARM_LCHIP_LOUT_NLIF_CRCERR_ERR	9
CMALARM_LCHIP_UCODE_TIMEOUT_ERR	10
CMALARM_LCHIP_LIN_SRCTL_ACCT_DROP_ERR	11
CMALARM_LCHIP_LIN_SRCTL_ACCT_ADDR_SIZE_ERR	12
CMALARM_LCHIP_SRAM_PARITY_ERR	13
CMALARM_LCHIP_UCODE_OVFLW_ERR	14
CMALARM_LCHIP_LOUT_HDRF_MTU_ERR	15

Chip Type: M Chip	Code
CMALARM_MCHIP_ECC_UNCORRECT_ERR	128

Chip Type: N Chip	Code
CMALARM_NCHIP_RDDMA_JBUS_TIMEOUT_ERR	256
CMALARM_NCHIP_RDDMA_FIFO_OVFLW_ERR	257
CMALARM_NCHIP_RDDMA_FIFO_UNFLW_ERR	258
CMALARM_NCHIP_RDDMA_SIZE_ERR	259
CMALARM_NCHIP_RDDMA_JBUS_CRC_ERR	260
CMALARM_NCHIP_WRDMA_PKTR_ERR	261
CMALARM_NCHIP_WRDMA_PKT_CRC_ERR	262
CMALARM_NCHIP_WRDMA_JBUS_TIMEOUT_ERR	263
CMALARM_NCHIP_WRDMA_FIFO_OVFLW_ERR	264
CMALARM_NCHIP_WRDMA_FIFO_UNFLW_ERR	265
CMALARM_NCHIP_WRDMA_PKT_LEN_ERR	266
CMALARM_NCHIP_WRDMA_JBUS_CRC_ERR	267

CMALARM_NCHIP_PKTR_DMA_AGE_ERR	268
CMALARM_NCHIP_PKTR_ICELLSIG_ERR	269
CMALARM_NCHIP_PKTR_FTTL_ERR	270
CMALARM_NCHIP_RODR_OFFSET_OVFLW_ERR	271
CMALARM_NCHIP_PKTR_TMO_CELL_ERR	272
CMALARM_NCHIP_PKTR_TMO_OUTRANGE_ERR	273
CMALARM_NCHIP_PKTR_MD_REQUEST_Q_OVFLW_ERR	274
CMALARM_NCHIP_PKTR_DMA_BUFFER_OVFLW_ERR	275
CMALARM_NCHIP_PKTR_GRT_OVFLW_ERR	276
CMALARM_NCHIP_FRQ_ERR	277
CMALARM_NCHIP_RODR_IN_Q_OVFLW_ERR	278
CMALARM_NCHIP_DBUF_CRC_ERR	279

Chip Type: R Chip	Code
CMALARM_RCHIP_SRAM_PARITY_ERR	512

Chip Type: R Chip	Code
CMALARM_ICHIP_WO_DESRD_ID_ERR	601
CMALARM_ICHIP_WO_DESRD_DATA_ERR	602
CMALARM_ICHIP_WO_DESRD_OFLOW_ERR	603
CMALARM_ICHIP_WO_HDRF_UCERR_ERR	604
CMALARM_ICHIP_WO_HDRF_MTUERR_ERR	605
CMALARM_ICHIP_WO_HDRF_PARITY_ERR	606
CMALARM_ICHIP_WO_HDRF_TOERR_ERR	607
CMALARM_ICHIP_WO_IP_CRC_ERR	608
CMALARM_ICHIP_WO_IP_INTER_ERR	609
CMALARM_ICHIP_WI_WAN_TIMEOUT_ERR	625

CMALARM_ICHIP_WI_FAB_TIMEOUT_ERR	626
CMALARM_ICHIP_RLDRAM_BIST_ERR	630
CMALARM_ICHIP_SDRAM_BIST_ERR	631
CMALARM_ICHIP_RLDRAM_PARITY_ERR	632
CMALARM_ICHIP_SDRAM_UNCORRECT_ERR	633
CMALARM_ICHIP_SDRAM_CORRECT_ERR	634
CMALARM_ICHIP_FUSE_DONE_ERR	635

According to the table above, the **279** error code corresponds to **CMALARM\_NCHIP\_DBUF\_CRC\_ERR**; this means that new CRC errors were seen on the NCHIP of this particular FPC, which is FPC as per the logs.

If you do not want to convert decimal to binary and vice versa, you may use the following shortcut:

For major alarms, the **Actual Error Code = (Error Code - 1)/2**, where **Error Code** is the code that you get in the log message. For example, if you get the following log:

```
Apr 12 08:04:10 send: red alarm set, device FPC 6, reason FPC 6 Major
Errors - Error code: 257
```

Actual Error Code =  $(257-1)/2 = 128$ . Similarly, for minor alarms, Actual Error Code =  $(\text{Error Code})/2$



**NOTE:** Starting in Junos OS Release 18.2R1, on MX Series routers, the **show chassis alarms** output does not display error codes for PFE-related errors. You can use the following commands to view more details of the errors that caused the alarms:

- **show chassis errors active**
- **show chassis errors active detail**

**Required Privilege Level** view

**Related Documentation**

- [Configuring an RMON Alarm Entry and Its Attributes](#)
- [Chassis Conditions That Trigger Alarms on page 530](#)

<b>List of Sample Output</b>	<a href="#">show chassis alarms (Alarms Active) on page 933</a>
	<a href="#">show chassis alarms (No Alarms Active) on page 933</a>
	<a href="#">show chassis alarms (Fan Tray) on page 933</a>
	<a href="#">show chassis alarms (MX150) on page 933</a>
	<a href="#">show chassis alarms (MX104 Router) on page 933</a>
	<a href="#">show chassis alarms (MX2010 Router) on page 934</a>
	<a href="#">show chassis alarms (MX2020 Router) on page 934</a>
	<a href="#">show chassis alarms (MX10003 Router) on page 934</a>
	<a href="#">show chassis alarms (MX204 Router) on page 934</a>
	<a href="#">show chassis alarms (MX2008 Router) on page 934</a>
	<a href="#">show chassis alarms (MX960, MX480, and MX240 Routers showing Major CB Failure) on page 935</a>
	<a href="#">show chassis alarms (PTX10008 Router) on page 935</a>
	<a href="#">show chassis alarms (T4000 Router) on page 935</a>
	<a href="#">show chassis alarms (Unreachable Destinations Present on a T Series Router) on page 936</a>
	<a href="#">show chassis alarms (FPC Offline Due to Unreachable Destinations on a T Series Router) on page 936</a>
	<a href="#">show chassis alarms (SCG Absent on a T Series Router) on page 936</a>
	<a href="#">show chassis alarms (Alarms Active on a TX Matrix Router) on page 936</a>
	<a href="#">show chassis alarms (TX Matrix Plus router with 3D SIBs) on page 937</a>
	<a href="#">show chassis alarms (Alarms on a T4000 Router After the enhanced-mode Statement is Enabled) on page 939</a>
	<a href="#">show chassis alarms (Backup Routing Engine) on page 939</a>
	<a href="#">show chassis alarms (EX Series Switch) on page 939</a>
	<a href="#">show chassis alarms (Alarms Active on the QFX Series and OCX Series Switches) on page 939</a>
	<a href="#">show chassis alarms node-device (Alarms Active on the QFabric System) on page 939</a>
	<a href="#">show chassis alarms (Alarms Active on the QFabric System) on page 940</a>
	<a href="#">show chassis alarms (Alarms Active on an EX8200 Switch) on page 940</a>
	<a href="#">show chassis alarms (EX9251 Switch) on page 940</a>
	<a href="#">show chassis alarms (EX9253 Switch) on page 941</a>
	<a href="#">show chassis alarms (Alarms Active on a PTX5000 Packet Transport Router) on page 941</a>
	<a href="#">show chassis alarms (Mix of PDUs Alarm on a PTX5000 Packet Transport Router with FPC2-PTX-PIA) on page 941</a>
	<a href="#">show chassis alarms (PDU Converter Failed Alarm on a PTX5000 Packet Transport Router with FPC2-PTX-PIA) on page 941</a>
	<a href="#">show chassis alarms (No Power for System Alarm on a PTX5000 Packet Transport Router with FPC2-PTX-PIA) on page 942</a>
	<a href="#">show chassis alarms (Alarms Active on an ACX2000 Universal Metro Router) on page 942</a>
	<a href="#">show chassis alarms (Active Alarm to Indicate Status of the Bad SCB Clock on MX Series) on page 942</a>
	<a href="#">show chassis alarms (Alarms active on a PTX1000 Packet Transport Router) on page 942</a>
	<a href="#">show chassis alarms (MX10003 Router) on page 943</a>
	<a href="#">show chassis alarms (Alarms active on a MX10008 Router) on page 944</a>

**Output Fields** Table 93 on page 933 lists the output fields for the **show chassis alarms** command. Output fields are listed in the approximate order in which they appear.

*Table 93: show chassis alarms Output Fields*

Field Name	Field Description
Alarm time	Date and time the alarm was first recorded.
Class	Severity class for this alarm: <b>Minor</b> or <b>Major</b> .
Description	Information about the alarm.

## Sample Output

### show chassis alarms (Alarms Active)

```
user@host> show chassis alarms
3 alarms are currently active
Alarm time      Class  Description
2000-02-07 10:12:22 UTC Major fxp0: ethernet link down
2000-02-07 10:11:54 UTC Minor YELLOW ALARM - PEM 1 Removed
2000-02-07 10:11:03 UTC Minor YELLOW ALARM - Lower Fan Tray Removed
```

### show chassis alarms (No Alarms Active)

```
user@host> show chassis alarms
No alarms are currently active
```

### show chassis alarms (Fan Tray)

```
user@host> show chassis alarms
4 alarms currently active
Alarm time      Class  Description
2010-11-11 20:27:38 UTC Major Side Fan Tray 7 Failure
2010-11-11 20:27:13 UTC Minor Side Fan Tray 7 Overspeed
2010-11-11 20:27:13 UTC Major Side Fan Tray 5 Failure
2010-11-11 20:27:13 UTC Major Side Fan Tray 0 Failure
```

### show chassis alarms (MX150)

```
user@host > show chassis alarms
1 alarms currently active
Alarm time      Class  Description
2016-06-04 01:49:43 PDT Major Fan Tray 1 Fan 0 failed
```

### show chassis alarms (MX104 Router)

```
user@host >show chassis alarms
```

```

1 alarms currently active
Alarm time      Class  Description
2013-06-05 14:43:31 IST  Minor  Backup RE Active

```

#### show chassis alarms (MX2010 Router)

```

user@host> show chassis alarms

7 alarms currently active
Alarm time      Class  Description
2012-08-07 00:46:06 PDT  Major  Fan Tray 2 Failure
2012-08-06 18:24:36 PDT  Minor  Redundant feed missing for PSM 6
2012-08-06 07:41:04 PDT  Minor  Redundant feed missing for PSM 8
2012-08-04 02:42:06 PDT  Minor  Redundant feed missing for PSM 5
2012-08-03 21:14:24 PDT  Minor  Loss of communication with Backup RE
2012-08-03 12:26:03 PDT  Minor  Redundant feed missing for PSM 4
2012-08-03 10:40:18 PDT  Minor  Redundant feed missing for PSM 7

```

#### show chassis alarms (MX2020 Router)

```

user@host> show chassis alarms

1 alarms currently active
Alarm time Class Description
2012-10-03 12:14:59 PDT Minor Plane 0 not online

```

#### show chassis alarms (MX10003 Router)

```

user@host> show chassis alarms

9 alarms currently active
Alarm time      Class  Description
2017-07-13 21:50:31 PDT  Major  FPC 1 Temperature Hot
2017-07-13 21:50:04 PDT  Minor  FPC 1 PIC 1 Invalid port profile configuration
2017-07-13 21:49:13 PDT  Minor  FPC 1 PIC 0 Invalid port profile configuration
2017-07-13 21:48:54 PDT  Major  FPC 0 Temperature Hot
2017-07-13 21:43:57 PDT  Minor  PEM 5 Not Present
2017-07-13 21:43:57 PDT  Minor  PEM 4 Not Present
2017-07-13 21:43:54 PDT  Minor  CB 1 Voltage Sensor ADS7830_0x4B Sensor Failed
2017-07-13 21:43:54 PDT  Minor  CB 0 Voltage Sensor ADS7830_0x4B Sensor Failed
2017-07-13 21:43:31 PDT  Minor  Loss of communication with Backup RE

```

#### show chassis alarms (MX204 Router)

```

user@host> show chassis alarms

1 alarms currently active
Alarm time      Class  Description
2017-11-05 22:13:03 PST  Major  PEM 0 Not Present

```

#### show chassis alarms (MX2008 Router)

```

user@host>show chassis alarms

No alarms currently active

```



**show chassis alarms (MX960, MX480, and MX240 Routers showing Major CB Failure)**

A major CB 0 failure alarm occurs in the event of a bad CB (unknown or mismatched CBs do not trigger this alarm in Junos Release OS 12.3R9 and later). Following GRES or recovery, if the hardware issue persists, the traffic moves to the good CB and continues. If the alarm was triggered by something transient like a power zone budget on GRES, bringing the CB back online can clear the alarm. Otherwise, replace the bad CB. Note that fabric link speed is not impacted by an offline SCB. The alarm might be raised on CB0, CB1, and CB2.

```
user@host> show chassis alarms
```

```
6 alarms currently active
Alarm time      Class Description
2014-10-31 16:49:41 EDT Major PEM 3 Not OK
2014-10-31 16:49:41 EDT Major PEM 2 Not OK
2014-10-31 16:49:31 EDT Major CB 0 Failure
2014-10-31 16:49:31 EDT Minor CB 0 Fabric Chip 0 Not Online
2014-10-31 16:49:31 EDT Minor CB 0 Fabric Chip 1 Not Online
2014-10-31 16:49:31 EDT Minor Backup RE Active
```

**show chassis alarms (PTX10008 Router)**

```
user@host>show chassis alarms
```

```
12 alarms currently active
Alarm time      Class Description
2017-05-09 01:38:55 PDT Minor Loss of communication with Backup RE
2017-05-05 06:49:57 PDT Major FPC 5 LCPU Temp Sensor Access Failed
2017-05-05 06:49:57 PDT Major FPC 5 PE2 Temp Sensor Hot
2017-05-05 06:49:57 PDT Major FPC 5 PE1 Temp Sensor Hot
2017-05-05 06:49:57 PDT Major FPC 5 PEO Temp Sensor Hot
2017-05-05 06:49:57 PDT Major FPC 5 Exhaust-C Temp Sensor Hot
2017-05-05 06:49:57 PDT Major FPC 5 Exhaust-B Temp Sensor Hot
2017-05-05 06:49:57 PDT Major FPC 5 Exhaust-A Temp Sensor Hot
2017-05-05 06:49:57 PDT Major FPC 5 Intake-B Temp Sensor Access Failed
2017-05-05 06:49:57 PDT Major FPC 5 Intake-A Temp Sensor Access Failed
2017-05-05 06:49:57 PDT Major Fan Tray 0 Fan 5 running at lower speed
2017-05-05 06:49:57 PDT Major Fan Tray 0 Fan 4 running at lower speed
```

**show chassis alarms (T4000 Router)**

```
user@host> show chassis alarms
```

```
9 alarms currently active
Alarm time      Class Description
2007-06-02 01:41:10 UTC Minor RE 0 Not Supported
2007-06-02 01:41:10 UTC Minor CB 0 Not Supported
2007-06-02 01:41:10 UTC Minor Mixed Master and Backup RE types
2007-05-30 19:37:33 UTC Major SPMB 1 not online
2007-05-30 19:37:29 UTC Minor Front Bottom Fan Tray Absent
2007-05-30 19:37:13 UTC Major PEM 1 Input Failure
2007-05-30 19:37:13 UTC Major PEM 0 Not OK
2007-05-30 19:37:03 UTC Major PEM 0 Improper for Platform
2007-05-30 19:37:03 UTC Minor Backup RE Active
```

**show chassis alarms (Unreachable Destinations Present on a T Series Router)**

```

user@host> show chassis alarms

10 alarms currently active
Alarm time      Class  Description
2011-08-30 18:43:53 PDT Major FPC 7 has unreachable destinations
2011-08-30 18:43:53 PDT Major FPC 5 has unreachable destinations
2011-08-30 18:43:52 PDT Major FPC 3 has unreachable destinations
2011-08-30 18:43:52 PDT Major FPC 2 has unreachable destinations
2011-08-30 18:43:52 PDT Minor SIB 0 Not Online
2011-08-30 18:43:33 PDT Minor SIB 4 Not Online
2011-08-30 18:43:28 PDT Minor SIB 3 Not Online
2011-08-30 18:43:05 PDT Minor SIB 2 Not Online
2011-08-30 18:43:28 PDT Minor SIB 1 Not Online
2011-08-30 18:43:05 PDT Major PEM 1 Not Ok

```

**show chassis alarms (FPC Offline Due to Unreachable Destinations on a T Series Router)**

```

user@host> show chassis alarms

10 alarms currently active
Alarm time      Class  Description
2011-08-30 18:43:53 PDT Major FPC 7 offline due to unreachable destinations
2011-08-30 18:43:53 PDT Major FPC 5 offline due to unreachable destinations
2011-08-30 18:43:52 PDT Major FPC 3 offline due to unreachable destinations
2011-08-30 18:43:52 PDT Major FPC 2 offline due to unreachable destinations
2011-08-30 18:43:52 PDT Minor SIB 0 Not Online
2011-08-30 18:43:33 PDT Minor SIB 4 Not Online
2011-08-30 18:43:28 PDT Minor SIB 3 Not Online
2011-08-30 18:43:05 PDT Minor SIB 2 Not Online
2011-08-30 18:43:28 PDT Minor SIB 1 Not Online
2011-08-30 18:43:05 PDT Major PEM 1 Not Ok

```

**show chassis alarms (SCG Absent on a T Series Router)**

```

user@host> show chassis alarms

4 alarms currently active
Alarm time      Class  Description
2011-01-23 21:42:46 PST Major SCG 0 NO EXT CLK MEAS-BKUP SCG ABS

```

**show chassis alarms (Alarms Active on a TX Matrix Router)**

```

user@host> show chassis alarms

scc-re0:
-----
8 alarms currently active
Alarm time      Class  Description
2004-08-05 18:43:53 PDT Minor LCC 0 Minor Errors
2004-08-05 18:43:53 PDT Minor SIB 3 Not Online
2004-08-05 18:43:52 PDT Major SIB 2 Absent
2004-08-05 18:43:52 PDT Major SIB 1 Absent
2004-08-05 18:43:52 PDT Major SIB 0 Absent
2004-08-05 18:43:33 PDT Major LCC 2 Major Errors
2004-08-05 18:43:28 PDT Major LCC 0 Major Errors
2004-08-05 18:43:05 PDT Minor LCC 2 Minor Errors
lcc0-re0:
-----

```

```

5 alarms currently active
Alarm time      Class  Description
2004-08-05 18:43:53 PDT  Minor  SIB 3 Not Online
2004-08-05 18:43:49 PDT  Major  SIB 2 Absent
2004-08-05 18:43:49 PDT  Major  SIB 1 Absent
2004-08-05 18:43:49 PDT  Major  SIB 0 Absent
2004-08-05 18:43:28 PDT  Major  PEM 0 Not OK
lcc2-re0:

```

```

-----
5 alarms currently active
Alarm time      Class  Description
2004-08-05 18:43:35 PDT  Minor  SIB 3 Not Online
2004-08-05 18:43:33 PDT  Major  SIB 2 Absent
2004-08-05 18:43:33 PDT  Major  SIB 1 Absent
2004-08-05 18:43:33 PDT  Major  SIB 0 Absent
2004-08-05 18:43:05 PDT  Minor  PEM 1 Absent

```

### show chassis alarms (TX Matrix Plus router with 3D SIBs)

```
user@host> show chassis alarms
```

```

sfc0-re0:
-----
Alarm time      Class  Description
2014-04-08 14:35:13 IST  Minor  FPM 0 SFC Config Size Changed
2014-04-08 14:32:58 IST  Major  Fan Tray Failure
2014-04-08 14:31:53 IST  Major  SIB F13 6 Fault
2014-04-08 14:31:43 IST  Major  SIB F13 11 Fault
2014-04-08 14:31:08 IST  Minor  Check SIB F13 12 CXP 14 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  Check SIB F13 12 CXP 8 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  Check SIB F13 12 CXP 3 Fbr Cbl
2014-04-08 14:31:08 IST  Major  SIB F13 12 CXP 15 fault
2014-04-08 14:31:08 IST  Minor  SIB F13 12 CXP 14 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 12 CXP 14
2014-04-08 14:31:08 IST  Major  SIB F13 12 CXP 10 fault
2014-04-08 14:31:08 IST  Minor  SIB F13 12 CXP 8 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 12 CXP 8
2014-04-08 14:31:08 IST  Major  SIB F13 12 CXP 7 fault
2014-04-08 14:31:08 IST  Major  SIB F13 12 CXP 4 fault
2014-04-08 14:31:08 IST  Minor  SIB F13 12 CXP 3 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 12 CXP 3
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 14 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 12 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 8 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 6 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 4 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 2 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 0 Fbr Cbl
2014-04-08 14:31:08 IST  Minor  SIB F13 6 CXP 14 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 14
2014-04-08 14:31:08 IST  Minor  SIB F13 6 CXP 12 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 12
2014-04-08 14:31:08 IST  Major  SIB F13 6 CXP 10 fault
2014-04-08 14:31:08 IST  Minor  SIB F13 6 CXP 8 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 8
2014-04-08 14:31:08 IST  Minor  SIB F13 6 CXP 6 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 6
2014-04-08 14:31:08 IST  Minor  SIB F13 6 CXP 4 LOL
2014-04-08 14:31:08 IST  Minor  Check SIB F13 6 CXP 4

```

```

2014-04-08 14:31:08 IST Minor SIB F13 6 CXP 2 LOL
2014-04-08 14:31:08 IST Minor Check SIB F13 6 CXP 2
2014-04-08 14:31:08 IST Minor SIB F13 6 CXP 0 LOL
2014-04-08 14:31:08 IST Minor Check SIB F13 6 CXP 0
2014-04-08 14:31:08 IST Minor SIB F13 12 CXP 14 XC HSL Link Error
2014-04-08 14:29:27 IST Minor LCC 0 Minor Errors
2014-04-08 14:28:37 IST Major LCC 0 Major Errors
2014-04-08 14:28:37 IST Major LCC 2 Major Errors
2014-04-08 14:28:37 IST Minor LCC 2 Minor Errors
2014-04-08 14:28:24 IST Major SIB F2S 4/6 Absent
2014-04-08 14:28:24 IST Major SIB F2S 4/4 Absent
2014-04-08 14:28:24 IST Major SIB F2S 4/2 Absent
2014-04-08 14:28:24 IST Major SIB F2S 4/0 Absent
2014-04-08 14:28:24 IST Major SIB F2S 3/6 Absent
2014-04-08 14:28:24 IST Major SIB F2S 3/4 Absent
2014-04-08 14:28:24 IST Major SIB F2S 3/2 Absent
2014-04-08 14:28:24 IST Major SIB F2S 3/0 Absent
2014-04-08 14:28:24 IST Major SIB F13 9 Absent
2014-04-08 14:28:24 IST Major SIB F13 8 Absent
2014-04-08 14:28:24 IST Major SIB F13 7 Absent
2014-04-08 14:28:24 IST Major SIB F13 4 Absent
2014-04-08 14:28:24 IST Major SIB F13 1 Absent
2014-04-08 14:28:22 IST Major PEM 0 Input Failure
2014-04-08 14:28:22 IST Major PEM 0 Not OK

```

lcc0-re0:

-----

12 alarms currently active

Alarm time	Class	Description
2014-04-08 14:36:08 IST	Minor	CB 1 M/S Switch Changed
2014-04-08 14:36:08 IST	Minor	CB 1 CHASSIS ID Changed
2014-04-08 14:35:43 IST	Minor	CB 0 M/S Switch Changed
2014-04-08 14:35:43 IST	Minor	CB 0 CHASSIS ID Changed
2014-04-08 14:29:30 IST	Minor	SIB 4 Not Online
2014-04-08 14:29:30 IST	Minor	SIB 3 Not Online
2014-04-08 14:29:30 IST	Minor	SIB 2 Not Online
2014-04-08 14:29:24 IST	Major	Rear Fan Tray Failure
2014-04-08 14:29:24 IST	Major	Front Bottom Fan Tray Improper for Platform
2014-04-08 14:29:24 IST	Major	Front Top Fan Tray Improper for Platform
2014-04-08 14:28:37 IST	Major	SIB 4 Absent
2014-04-08 14:28:37 IST	Major	SIB 3 Absent

lcc2-re0:

-----

12 alarms currently active

Alarm time	Class	Description
2014-04-08 14:36:02 IST	Minor	CB 1 M/S Switch Changed
2014-04-08 14:36:02 IST	Minor	CB 1 CHASSIS ID Changed
2014-04-08 14:35:42 IST	Minor	CB 0 M/S Switch Changed
2014-04-08 14:34:42 IST	Minor	CB 0 CHASSIS ID Changed
2014-04-08 14:29:29 IST	Minor	SIB 0 CXP 7 Unsupported Optics
2014-04-08 14:29:27 IST	Major	Front Bottom Fan Tray Improper for Platform
2014-04-08 14:29:27 IST	Major	Front Top Fan Tray Improper for Platform
2014-04-08 14:29:25 IST	Minor	SIB 4 Not Online
2014-04-08 14:29:25 IST	Minor	SIB 3 Not Online
2014-04-08 14:28:47 IST	Major	PEM 0 Not OK
2014-04-08 14:28:36 IST	Major	SIB 2 Absent
2014-04-08 14:28:36 IST	Minor	Host 0 Boot from alternate media

lcc6-re0:

```
-----
2 alarms currently active
Alarm time          Class  Description
2013-11-06 04:03:56 PST  Minor SIB 1 CXP 0 XC HSL Link Error
2013-11-06 03:49:32 PST  Major PEM 1 Not OK
```

### show chassis alarms (Alarms on a T4000 Router After the enhanced-mode Statement is Enabled)

To enable improved virtual private LAN service (VPLS) MAC address learning on T4000 routers, you must include the **enhanced-mode** statement at the **[edit chassis network-services]** hierarchy level and reboot the router. When router reboots, only the T4000 Type 5 FPCs are required to be present on the router. If there are any other FPCs (apart from T4000 Type 5 FPCs) on the T4000 router, such FPCs become offline, and FPC misconfiguration alarms are generated. The **show chassis alarm** command output displays FPC misconfiguration (**FPC *fpc-slot* misconfig**) as the reason for the generation of the alarms.

```
user@host> show chassis alarms

2 alarms currently active
Alarm time          Class  Description
2011-10-22 10:10:47 PDT  Major FPC 1 misconfig
2011-10-22 10:10:46 PDT  Major FPC 0 misconfig
```

### show chassis alarms (Backup Routing Engine)

```
user@host> show chassis alarms

2 alarms are currently active
Alarm time          Class  Description
2005-04-07 10:12:22 PDT  Minor Host 1 Boot from alternate media
2005-04-07 10:11:54 PDT  Major Host 1 compact-flash missing in Boot List
```

### show chassis alarms (EX Series Switch)

```
user@switch> show chassis alarms

4 alarms currently active
Alarm time          Class  Description
2014-03-12 15:36:09 UTC  Minor Require a Fan Tray upgrade
2014-03-12 15:00:02 UTC  Major PEM 0 Input Failure
2014-03-12 15:00:02 UTC  Major PEM 0 Not OK
2014-03-12 14:59:51 UTC  Minor Host 1 Boot from alternate media
```

### show chassis alarms (Alarms Active on the QFX Series and OCX Series Switches)

```
user@switch> show chassis alarms

1 alarms currently active
Alarm time          Class  Description
2012-03-05 2:10:24 UTC  Major FPC 0 PEM 0 Airflow not matching Chassis Airflow
```

### show chassis alarms node-device (Alarms Active on the QFabric System)

```
user@switch> show chassis alarms node-device Test
```

```
node-device ED3694
3 alarms currently active
Alarm time          Class Description
2011-08-24 16:04:15 UTC Major Test:fte-0/1/2: Link down
2011-08-24 16:04:14 UTC Major Test:fte-0/1/0: Link down
2011-08-24 14:21:14 UTC Major Test PEM 0 is not supported/powerd
```

### show chassis alarms (Alarms Active on the QFabric System)

```
user@switch> show chassis alarms
```

```
IC-1:
```

```
-----
1 alarms currently active
Alarm time          Class Description
2011-08-24 16:04:15 UTC Minor Backup RE Active
```

```
Test:
```

```
-----
3 alarms currently active
Alarm time          Class Description
2011-08-24 16:04:15 UTC Major Test:fte-0/1/2: Link down
2011-08-24 16:04:14 UTC Major Test:fte-0/1/0: Link down
2011-08-24 14:21:14 UTC Major Test PEM 0 is not supported/powerd
```

```
SNG-0:
```

```
NW-NG-0:
```

```
-----
1 alarms currently active
Alarm time          Class Description
2011-08-24 15:49:27 UTC Major Test PEM 0 is not supported/powerd
```

### show chassis alarms (Alarms Active on an EX8200 Switch)

```
user@switch> show chassis alarms
```

```
6 alarms currently active
Alarm time          Class Description
2010-12-02 19:15:22 UTC Major Fan Tray Failure
2010-12-02 19:15:22 UTC Major Fan Tray Failure
2010-12-02 19:15:14 UTC Minor Check CB 0 Fabric Chip 1 on Plane/FPC/PFE: 1/5/0,
1/5/1, 1/5/2, 1/5/3, 1/7/0, 1/7/1, 1/7/2, 1/7/3, 2/5/0, 2/5/1, ...
2010-12-02 19:15:14 UTC Minor Check CB 0 Fabric Chip 0 on Plane/FPC/PFE: 1/5/0,
1/5/1, 1/5/2, 1/5/3, 1/7/0, 1/7/1, 1/7/2, 1/7/3, 2/5/0, 2/5/1, ...
2010-12-02 19:14:18 UTC Major PSU 1 Output Failure
2010-12-02 19:14:18 UTC Minor Loss of communication with Backup RE
```

### show chassis alarms (EX9251 Switch)

```
user@switch> show chassis alarms
```

```
2 alarms currently active
Alarm time          Class Description
2018-03-08 05:13:10 PST Major PEM 0 Not Powered
2018-03-08 05:13:10 PST Major Fan Tray 2 is not present
```

### show chassis alarms (EX9253 Switch)

```
user@switch> show chassis alarms
```

```
6 alarms currently active
```

Alarm time	Class	Description
2018-03-07 01:09:01 PST	Major	Power Budget:Insufficient Power
2018-03-06 23:56:34 PST	Minor	Loss of communication with Backup RE
2018-02-15 00:48:10 PST	Minor	PEM 3 Not Present
2018-02-15 00:48:10 PST	Minor	PEM 2 Not Present
2018-02-15 00:48:07 PST	Major	PEM 4 Not Powered
2018-02-15 00:48:07 PST	Major	PEM 1 Not Powered

### show chassis alarms (Alarms Active on a PTX5000 Packet Transport Router)

```
user@host> show chassis alarms
```

```
23 alarms currently active
```

Alarm time	Class	Description
2011-07-12 16:22:05 PDT	Minor	No Redundant Power for Rear Chassis
2011-07-12 16:22:05 PDT	Major	PDU 0 PSM 1 Not OK
2011-07-12 16:21:57 PDT	Minor	No Redundant Power for Fan 0-2
2011-07-12 16:21:57 PDT	Major	PDU 0 PSM 0 Not OK
2011-07-12 15:56:06 PDT	Major	PDU 1 PSM 2 Not OK
2011-07-12 15:56:06 PDT	Minor	No Redundant Power for FPC 0-7
2011-07-12 15:56:06 PDT	Major	PDU 0 PSM 3 Not OK
2011-07-12 15:28:20 PDT	Major	PDU 0 PSM 2 Not OK
2011-07-12 15:19:14 PDT	Minor	Backup RE Active

### show chassis alarms (Mix of PDUs Alarm on a PTX5000 Packet Transport Router with FPC2-PTX-PIA)

All PDUs installed on a PTX5000 router must be of the same type. The **Mix of PDUs** or **Power Manager Non Operational** alarm is raised when different types of PDUs are installed on a PTX5000 router.

```
user@host> show chassis alarms
```

```
15 alarms currently active
```

Alarm time	Class	Description
2013-03-19 23:03:53 PDT	Minor	No Redundant Power
<b>2013-03-19 23:03:48 PDT</b>	<b>Minor</b>	<b>Mix of PDUs</b>
2013-03-19 23:03:47 PDT	Minor	PDU 1 PSM 3 Absent
2013-03-19 23:03:47 PDT	Minor	PDU 1 PSM 2 Absent
2013-03-19 23:03:47 PDT	Minor	PDU 1 PSM 1 Absent
2013-03-19 23:03:47 PDT	Minor	PDU 1 PSM 0 Absent
2013-03-19 23:03:46 PDT	Major	No CG Online

### show chassis alarms (PDU Converter Failed Alarm on a PTX5000 Packet Transport Router with FPC2-PTX-PIA)

The **PDU Converter Failed** alarm is raised when one or more 36 V booster converter of a DC PDU fails. If two or more 36 V booster converter fails, fan trays fail and the router might get over heated. Therefore, when this alarm is raised, check the PDU and replace it, if required.

```
user@host> show chassis alarms
```

```

11 alarms currently active
Alarm time      Class Description
2013-12-11 22:14:13 PST Minor No Redundant Power for System
2013-12-11 22:14:10 PST Major PDU 0 PSM 7 Not OK
2013-12-11 22:14:10 PST Major PDU 0 PSM 6 Not OK
2013-12-11 22:14:10 PST Major PDU 0 PSM 5 Not OK
2013-12-11 22:14:10 PST Major PDU 0 PSM 4 Not OK
2013-12-11 22:14:10 PST Major PDU 0 PSM 3 Not OK
2013-12-11 22:14:10 PST Major PDU 0 PSM 2 Not OK
2013-12-11 22:14:10 PST Major PDU 0 PSM 1 Not OK
2013-12-11 22:14:10 PST Major PDU 0 PSM 0 Not OK
2013-12-11 22:14:10 PST Major PDU 0 Not OK
2013-12-11 22:14:01 PST Major PDU 0 Converter Failed

```

#### show chassis alarms (No Power for System Alarm on a PTX5000 Packet Transport Router with FPC2-PTX-PIA)

```

user@host> show chassis alarms

8 alarms currently active
Alarm time      Class Description
2013-11-19 01:58:41 PST Major No Power for System
2013-11-19 01:58:37 PST Major PDU 0 PSM 1 Not OK
2013-11-19 01:56:46 PST Major PDU 0 PSM 2 Not OK
2013-11-19 01:54:26 PST Major PDU 0 PSM 3 Not OK
2013-11-19 01:53:30 PST Major PDU 1 PSM 3 Not OK
2013-11-19 01:53:29 PST Major PDU 1 PSM 2 Not OK
2013-11-19 01:53:29 PST Major PDU 1 PSM 1 Not OK
2013-11-19 01:53:29 PST Major PDU 1 PSM 0 Not OK

```

#### show chassis alarms (Alarms Active on an ACX2000 Universal Metro Router)

```

user@host> show chassis alarms

7 alarms currently active
Alarm time      Class Description
2012-05-22 11:19:09 UTC Major xe-0/3/1: Link down
2012-05-22 11:19:09 UTC Major xe-0/3/0: Link down
2012-05-22 11:19:09 UTC Major ge-0/1/7: Link down
2012-05-22 11:19:09 UTC Major ge-0/1/6: Link down
2012-05-22 11:19:09 UTC Major ge-0/1/3: Link down
2012-05-22 11:19:09 UTC Major ge-0/1/2: Link down
2012-05-22 11:19:09 UTC Major ge-0/1/1: Link down

```

#### show chassis alarms (Active Alarm to Indicate Status of the Bad SCB Clock on MX Series)

```

user@host> show chassis alarms

1 alarm currently active
Alarm time      Class Description
2013-08-06 07:48:35 PDT Major CB 0 19.44 MHz clock failure

```

#### show chassis alarms (Alarms active on a PTX1000 Packet Transport Router)

```

user@host> show chassis alarms

2 alarms currently active
Alarm time      Class Description
2004-08-10 00:55:49 UTC Major PEM 1 Not Present
2004-08-10 00:55:49 UTC Major PEM 0 Not Present

```



### show chassis alarms (MX10003 Router)

If LCMD is down on the backup RE, then the following alarm is seen on the Master.

```
user@host> show chassis alarms
```

```
1 alarm currently active
Alarm time      Class  Description
2017-05-09 13:26:27 PDT Major  VMHost RE 1 host application failed
```

If LCMD is down on the master, then following alarms are displayed.

```
user@host> show chassis alarms
```

```
3 alarms currently active
Alarm time      Class  Description
2017-05-10 14:12:21 PDT Major  VMHost RE 0 host application failed
2017-05-10 14:12:16 PDT Minor  LCM Peer Absent
2017-05-09 13:26:27 PDT Major  VMHost RE 1 host application failed
```

If the LCMD process is crashing on the master, the system will switchover after one minute provided the backup RE LCMD connection is stable. The system will not switchover under the following conditions: if the backup RE LCMD connection is unstable or if the current master just gained mastership. When the master has just gained mastership, the switchover happens only after four minutes.

The LCM peer connection un-stable alarm is raised when the LCMD-CHASD IPC communication flaps three times within a small interval of two to three minutes. Once LCM peer connection un-stable alarm is raised, the connection status is monitored for two minutes.

```
user@host> show chassis alarms
```

```
7 alarms currently active
Alarm time      Class  Description
2017-05-29 10:12:17 PDT Minor  LCM Peer Connection un-stable
2017-05-29 09:04:17 PDT Minor  PEM 8 Not Powered
2017-05-29 09:04:17 PDT Minor  PEM 9 Not Powered
2017-05-29 09:04:17 PDT Minor  PEM 7 Not Powered
2017-05-29 09:04:17 PDT Minor  PEM 3 Not Powered
2017-05-29 09:04:17 PDT Minor  PEM 0 Not Powered
2017-05-29 09:04:08 PDT Minor  Loss of communication with Backup RE
```

If there are no more connection flaps within this two minutes time interval, the LCM peer connection un-stable alarm is cleared.

```
6 alarms currently active
Alarm time      Class  Description
2017-05-29 09:04:17 PDT Minor  PEM 8 Not Powered
2017-05-29 09:04:17 PDT Minor  PEM 9 Not Powered
2017-05-29 09:04:17 PDT Minor  PEM 7 Not Powered
2017-05-29 09:04:17 PDT Minor  PEM 3 Not Powered
2017-05-29 09:04:17 PDT Minor  PEM 0 Not Powered
2017-05-29 09:04:08 PDT Minor  Loss of communication with Backup RE
```

A major alarm is raised even if there is on one PLL lock error, and this alarm can be cleared only through an FPC restart.

```
user@host> show chassis alarms
```

```
4 alarms currently active
```

Alarm time	Class	Description
2017-02-16 09:06:06 PDT	Major	FPC 0 Major Errors
2017-02-16 09:08:40 PDT	Major	FPC 1 Major Errors
2017-02-16 09:11:47 PST	Minor	Fan Tray 3 Pair 1 Outer Fan running at over speed
2017-02-16 09:11:47 PST	Minor	Fan Tray 3 Pair 1 Inner Fan running at over speed

#### show chassis alarms (Alarms active on a MX10008 Router)

```
user@host> show chassis alarms
```

```
13 alarms currently active
```

Alarm time	Class	Description
2018-07-17 05:48:08 PDT	Major	FPC 2 I2C Failure
2018-07-17 05:47:02 PDT	Minor	Mixed Master and Backup RE types
2018-07-17 05:47:01 PDT	Major	Fan Tray 0 Fan 5 Failed
2018-07-17 05:47:01 PDT	Major	Fan Tray 0 Fan 4 Failed
2018-07-17 05:47:01 PDT	Minor	PEM 5 Not Powered
2018-07-17 05:47:01 PDT	Minor	PEM 5 Feed 2 has no input source
2018-07-17 05:47:01 PDT	Minor	PEM 5 Feed 1 has no input source
2018-07-17 05:47:01 PDT	Minor	PEM 4 Not Powered
2018-07-17 05:47:01 PDT	Minor	PEM 4 Feed 2 has no input source
2018-07-17 05:47:01 PDT	Minor	PEM 4 Feed 1 has no input source
2018-07-17 05:47:01 PDT	Minor	PEM 3 Not Powered
2018-07-17 05:47:01 PDT	Minor	PEM 3 Feed 2 has no input source
2018-07-17 05:47:01 PDT	Minor	PEM 3 Feed 1 has no input source

## show chassis cfeb

<b>Syntax</b>	show chassis cfeb
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	(M7i and M10i routers only) Display status information about the Compact Forwarding Engine Board (CFEB).
<b>Options</b>	This command has no options.
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">request chassis cfeb on page 845</a></li> <li>• <i>Configuring CFEB Redundancy on the M10i Router</i></li> <li>• <i>CFEB Overview</i></li> </ul>
<b>List of Sample Output</b>	<a href="#">show chassis cfeb (M7i) on page 946</a> <a href="#">show chassis cfeb (M10i) on page 946</a>
<b>Output Fields</b>	Table 94 on page 945 lists the output fields for the <b>show chassis cfeb</b> command. Output fields are listed in the approximate order in which they appear.

Table 94: show chassis cfeb Output Fields

Field Name	Field Description
<b>State</b>	Status of the CFEB: <ul style="list-style-type: none"> <li>• <b>Online</b>—CFEB is online and running.</li> <li>• <b>Offline</b>—CFEB is powered down.</li> </ul>
<b>Intake Temperature</b>	Temperature of the air before flowing past the CFEB.
<b>Exhaust Temperature</b>	Temperature of the air after flowing past the CFEB.
<b>CPU utilization</b>	Percentage of CPU being used by the CFEB processor.
<b>Interrupt utilization</b>	Of the total CPU being used by the CFEB processor, the percentage being used for interrupts
<b>Heap Utilization</b>	Percentage of heap space (dynamic memory) being used by the CFEB processor. If this number exceeds 80 percent, there may be a software problem (memory leak).

Table 94: show chassis cfep Output Fields (continued)

Field Name	Field Description
<b>Buffer Utilization</b>	Percentage of buffer space being used by the CFEB processor for buffering internal messages
<b>Total CPU DRAM</b>	Amount of DRAM available to the CFEB CPU.
<b>Internet Processor II</b>	Information about the CFEB processor.
<b>Start time</b>	Time when the Routing Engine detected that the CFEB was running.
<b>Uptime</b>	How long the Routing Engine has been connected to the CFEB and, therefore, how long the Flexible PIC Concentrator (FPC) has been up and running.

## Sample Output

### show chassis cfep (M7i)

```
user@host> show chassis cfep
```

```
CFEB status:
  State                Online
  Intake Temperature   27 degrees C / 80 degrees F
  Exhaust Temperature  33 degrees C / 91 degrees F
  CPU utilization       3 percent
  Interrupt utilization 0 percent
  Heap utilization      8 percent
  Buffer utilization     21 percent
  Total CPU DRAM       128 MB
  Internet Processor II Version 1, Foundry IBM, Part number 164
  Start time:          2003-06-11 11:41:22 PDT
  Uptime:               1 hour, 39 minutes, 31 seconds
```

### show chassis cfep (M10i)

```
user@host> show chassis cfep
```

```
CFEB status:
Slot 0 information:
  StateMaster
  Intake temperature   35 degrees C / 95 degrees F
  Exhaust temperature  43 degrees C / 109 degrees F
  CPU utilization       3 percent
  Interrupt utilization 0 percent
  Heap utilization      10 percent
  Buffer utilization     22 percent
  Total CPU DRAM       128 MB
  Internet Processor II Version 1, Foundry IBM, Part number 164
  Start time:          2004-11-01 03:24:15 PST
  Uptime:               12 hours, 56 minutes, 18 seconds
Slot 1 information:
  State                Backup
```

## show chassis cip

<b>Syntax (TX Matrix Plus Router)</b>	show chassis cip
<b>Release Information</b>	Command introduced in Junos OS Release 9.6.
<b>Description</b>	(TX Matrix Plus routers only) Display environmental information about the Connector Interface Panel (CIP) that provides Ethernet Control Plane connectivity to line-card chassis (LCCs), switch fabric chassis, and other devices.
<b>Options</b>	This command has no options.
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">request chassis cip on page 846</a></li> <li>• <i>Installing a T1600 CIP</i></li> <li>• <i>Installing a T640 CIP</i></li> <li>• <i>Installing a TX-CIP</i></li> <li>• <i>Installing an M320 CIP</i></li> <li>• <i>Installing an M320 CIP</i></li> <li>• <i>Installing the T320 CIP</i></li> <li>• <i>CIP Overview</i></li> </ul>
<b>Output Fields</b>	<a href="#">Table 95 on page 947</a> lists the output fields for the <b>show chassis cip</b> command. Output fields are listed in the approximate order in which they appear.

Table 95: show chassis cip Output Fields

Field Name	Field Description
Eswitch	Ethernet switch used to connect to the LCC or to a JCS1200: 0 or 1.

Table 95: show chassis cip Output Fields (continued)

Field Name	Field Description
Port	Physical port number of the Ethernet switch: <ul style="list-style-type: none"> <li>Port numbers: 4 to 8 on Ethernet switch 0 can be used to connect up to four (reserved for future use) other SFCs or optional JCS1200s.</li> <li><b>NOTE:</b> The current configuration of the routing matrix based on a TX Matrix Plus router supports only one SFC.</li> <li>Port numbers 0 to 15 on Ethernet switch 1 can be used to connect up to 16 LCCs.</li> <li><b>NOTE:</b> The current configuration of a routing matrix based on a TX Matrix Plus router supports only up to eight LCCs. You can connect LCCs to the port numbers corresponding to LCC0 to LCC7 (0 to 15) on the Ethernet switch 1.</li> </ul>
Type	Type of CIP: <ul style="list-style-type: none"> <li><b>XE</b>—Ethernet switch 0 ports used for connections to the SFC control plane or other devices such as JCS1200.</li> <li><b>GE</b>—Ethernet switch 1 ports used for connections to the LCC control plane.</li> </ul>
Connected-to	Show control plane connection to a specific LCC or SFC.
Link	State of the connection to an LCC control plane, SFC control plane, or other devices: <b>Up</b> or <b>Down</b> .
Speed	Ethernet link speed.
Duplex	Type of Ethernet link: <b>Full</b> or <b>Half Duplex</b> .
Auto-neg	Status of autonegotiation for the CIP connection to the LCC, SFC, or other devices: <b>On</b> or <b>Off</b> .

## show chassis cip (TX Matrix Plus Router)

user@host&gt; show chassis cip

sfc0-cip0

Eswitch	Port	Type	Connected-to	Link	Speed	Duplex	Auto-Neg
0	4	XE	SFC1	Down	0	Full	Off
0	5	XE	SFC0	Down	0	Full	Off
0	6	XE	SFC3	Down	0	Full	Off
0	7	XE	SFC2	Down	0	Full	Off
0	8	XE	SFC4	Down	0	Full	Off
1	0	GE	LCC0	Up	1000Mbps	Full	On
1	1	GE	LCC8	Down	0	Half	On
1	2	GE	LCC1	Up	1000Mbps	Full	On
1	3	GE	LCC9	Down	0	Half	On
1	4	GE	LCC2	Up	1000Mbps	Full	On
1	5	GE	LCC10	Down	0	Half	On
1	6	GE	LCC3	Up	1000Mbps	Full	On
1	7	GE	LCC11	Down	0	Half	On
1	8	GE	LCC4	Down	0	Half	On
1	9	GE	LCC12	Down	0	Half	On
1	10	GE	LCC5	Down	0	Half	On
1	11	GE	LCC13	Down	0	Half	On

1	12	GE	LCC6	Down	0	Half	On
1	13	GE	LCC14	Down	0	Half	On
1	14	GE	LCC7	Down	0	Half	On
1	15	GE	LCC15	Down	0	Half	On
1	16	GE	GE17	Up	1000Mbps	Full	On
1	17	GE	GE16	Down	0	Half	On

## show chassis craft-interface

<b>List of Syntax</b>	<a href="#">Syntax on page 950</a> <a href="#">Syntax (MX Series Routers) on page 950</a> <a href="#">Syntax (MX104, MX2010, MX2020, and MX2008 Universal Routing Platforms) on page 950</a> <a href="#">Syntax (TX Matrix Routers) on page 950</a> <a href="#">Syntax (TX Matrix Plus Routers) on page 950</a> <a href="#">Syntax (ACX Series Universal Metro Routers) on page 950</a>
<b>Syntax</b>	show chassis craft-interface
<b>Syntax (MX Series Routers)</b>	show chassis craft-interface <all-members> <local> <member <i>member-id</i> >
<b>Syntax (MX104, MX2010, MX2020, and MX2008 Universal Routing Platforms)</b>	show chassis craft-interface
<b>Syntax (TX Matrix Routers)</b>	show chassis craft-interface <lcc <i>number</i>   scc>
<b>Syntax (TX Matrix Plus Routers)</b>	show chassis craft-interface <lcc <i>number</i>   sfc <i>number</i> >
<b>Syntax (ACX Series Universal Metro Routers)</b>	show chassis craft-interface
<b>Release Information</b>	Command introduced before Junos OS Release 7.4. sfc option for the TX Matrix Plus router introduced in Junos OS Release 9.6. Command introduced in Junos OS Release 12.2 for ACX Series Universal Metro Routers. Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms. Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms. Command introduced in Junos OS Release 13.2 for MX104 Universal Routing Platforms. Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms. Command introduced in Junos OS Release 17.3 for MX150 Router Appliance.
<b>Description</b>	For routers or switches that have a display on the craft interface, show the messages that are currently displayed. On all routers except for the M20 router, you must enter this command on the master Routing Engine.



**Options** **none**—(TX Matrix, TX Matrix Plus routers, MX104, MX2010, MX2020, and MX2008 routers, and ACX Series routers only) On a TX Matrix router, show messages that are currently displayed on the craft interface on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, show messages that are currently displayed on the craft interface on the TX Matrix Plus router and its attached routers.

**all-members**—(MX Series routers only) (Optional) Display information currently on the craft interface for all members of the Virtual Chassis configuration.

**lcc *number***—(TX Matrix, TX Matrix Plus routers only) (Optional) On a TX Matrix router, show messages that are currently displayed on the craft interface for a specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, show messages that are currently displayed on the craft interface for a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers only) (Optional) Display information currently on the craft interface for the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Display information currently on the craft interface for the specified member of the Virtual Chassis configuration. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

**scc**—(TX Matrix router only) (Optional) Show messages that are currently displayed on the craft interface for the TX Matrix router (switch-card chassis).

**sfc *number***—(TX Matrix Plus router only) (Optional) Show messages that are currently displayed on the craft interface for the respective TX Matrix Plus router (switch-fabric chassis). Replace *number* variable with 0.

**Required Privilege Level** view

**Related Documentation**

- [clear chassis display message on page 833](#)
- [set chassis display message on page 914](#)

**List of Sample Output**

- [show chassis craft-interface \(M20 Router\) on page 953](#)
- [show chassis craft-interface \(M40 Router\) on page 954](#)
- [show chassis craft-interface \(M120 Router\) on page 954](#)
- [show chassis craft-interface \(M160 Router\) on page 955](#)
- [show chassis craft-interface \(MX150\) on page 955](#)
- [show chassis craft-interface \(MX104 Router\) on page 956](#)
- [show chassis craft-interface \(MX2010 Router\) on page 956](#)
- [show chassis craft-interface \(MX2020 Router\) on page 957](#)
- [show chassis craft-interface \(MX2008 Router\) on page 958](#)
- [show chassis craft-interface \(T4000 Router\) on page 959](#)
- [show chassis craft-interface \(TX Matrix Routing Matrix\) on page 960](#)
- [show chassis craft-interface \(TX Matrix Plus Routing Matrix\) on page 962](#)
- [show chassis craft-interface \(TX Matrix Plus router with 3D SIBs\) on page 965](#)
- [show chassis craft-interface \(ACX2000 Universal Metro Router\) on page 967](#)
- [show chassis craft-interface \(ACX500 Router\) on page 967](#)

**Output Fields** [Table 96 on page 952](#) lists the output fields for the **show chassis craft-interface** command. Output fields are listed in the approximate order in which they appear.

*Table 96: show chassis craft-interface Output Fields*

Field Name	Field Description
LCD screen or FPM Display Contents	<p>Contents of the Front Panel Module display:</p> <ul style="list-style-type: none"> <li>• <b>router-name</b>—Name of the router.</li> <li>• <b>Up</b>—How long the router has been operational, in days, hours, minutes, and seconds.</li> <li>• <b>message</b>—Information about the router traffic load, the power supply status, the fan status, and the temperature status. The display of this information changes every 2 seconds. If a text message has been created with the <b>set chassis display</b> command, this message appears on all four lines of the craft interface display. The display alternates between the text message and the standard system status messages every 2 seconds.</li> </ul>
SFC Front Panel Switch Settings	<p>(TX Matrix Plus Routers)—Display the SFC front panel switch settings:</p> <p><b>SFC Chassis Number</b> and <b>Config Size</b> are settings on physical switches located on the left side of the craft interface of the TX Matrix Plus router.</p> <ul style="list-style-type: none"> <li>• <b>SFC Chassis Number</b>—This field always displays the value <b>00</b>.</li> <li>• <b>Config Size</b>—The value of this field is <b>0</b> for the TX Matrix Plus router. The value of this field is <b>3</b> for TX Matrix Plus router with 3D SIBs.</li> </ul>
Front Panel System LEDs	<p>(MX104, MX2010, MX2020, and MX2008 Routers) Status of the Front Panel System LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.</p>
Front Panel Alarm Indicators	<p>(MX104, MX2010, MX2020, and MX2008 Routers) Status of the Front Panel Alarm indicators. A dot (.) indicates the relay is off. An asterisk (*) indicates the relay is active.</p>
Input Relay	<p>Status of the configured input relay ports—0 through 3. The mode is normally open or closed. The status is clear or raised.</p>
Output Relay	<p>Status of the configured output ports—0 or 1. The mode is normally open or closed. The status is clear or raised.</p>

Table 96: show chassis craft-interface Output Fields (continued)

Field Name	Field Description
<b>Front Panel FPC LEDs</b>	(MX2010, MX2020, and MX2008 Routers) Status of the Front Panel Flexible PIC Concentrator (FPC) LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit. On MX2010 and MX2008 routers, there are 10 (0-9) FPCs LEDs. On MX2020 routers, there are 20 (0-9 and 10-19) FPCs LEDs.
<b>CB LEDs</b>	Status of the Control Board (CB) LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.
<b>PS LEDs</b>	(MX2010, MX2020, and MX2008 Routers) Status of the Power Supply (PS) LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit. On MX2010 and MX2008 routers, there are 9 (0-8) PS LEDs. On MX2020 routers, there are 18 (0-8 and 9-17) PS LEDs.
<b>PS Status</b>	(MX104 Routers) Status of the Power Supply (PS). Green indicates that the power supply is functioning. Red indicates that the power supply is not functioning. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.
<b>FAN Tray LEDs</b>	(MX2010, MX2020, and MX2008 Routers) Status of the Fan Tray LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.
<b>Front Panel SFB LEDs</b>	(MX2010, MX2020, and MX2008 Routers) Status of the Front Panel Switch Fabric Boards (SFB) LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.
<b>Front Panel Chassis Info</b>	(MX2010, MX2020, and MX2008 Routers) Information about the chassis such as the chassis number and role. User can set the chassis number in multi-chassis configurations.
<b>MCS and SFM LEDs</b>	Status of the Miscellaneous Control Subsystem (MCS) and Switching and Forwarding Module (SFM) LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit. When neither a dot nor an asterisk is displayed, there is no board in that slot.
<b>SIB LEDs</b>	Status of the Switch Interface Board (SIB) LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.
<b>SCG LEDs</b>	Status of the SONET Clock Generator (SCG) LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.

## Sample Output

### show chassis craft-interface (M20 Router)

```
user@host> show chassis craft-interface
```

```
Red alarm:    LED off, relay off
Yellow alarm: LED on, relay on
Host OK LED:  On
Host fail LED: Off
FPCs         0  1  2  3
-----
Green  .  *  *.
Red    ...
LCD screen:
      +-----+
```

```

|host
|1 Alarm active
|Y: FERF
|
+-----+

```

### show chassis craft-interface (M40 Router)

```
user@host> show chassis craft-interface
```

```

Front Panel LCD Display: enabled
Red alarm:      LED off, relay off
Yellow alarm:   LED off, relay off
Host OK LED:    On
Host Fail LED:  Off
NICs    0  1  2  3  4  5  6  7
-----

```

```
Green  *.  *.  *.  *.

```

```
Red    .....

```

```
LCD Screen:
```

```

+-----+
|host
|Up: 27+18:52:37
|
|52.649kpps Load
|
+-----+

```

### show chassis craft-interface (M120 Router)

```
user@host> show chassis craft-interface
```

```
Front Panel System LEDs:
```

```
Routing Engine    0    1
-----
```

```
OK                *    .

```

```
Fail              .    .

```

```
Master            *    .

```

```
Front Panel Alarm Indicators:
```

```
Red LED           *
```

```
Yellow LED        .
```

```
Major relay       *
```

```
Minor relay        .
```

```
Front Panel FPC LEDs:
```

```
FPC    0    1    2    3    4    5
-----
```

```
Red    .    .    .    .    .    .

```

```
Green  .    *    .    *    *    *
```

```
CB LEDs:
```

```
CB    0    1
-----
```

```
Amber  .    .

```

```
Green  *    *
```

```
PS LEDs:
```

```
PS    0    1
```

```

-----
Red      .      .
Green    *      *

FEB LEDs:
  FEB    0      1      2      3      4      5
-----
Red      .      .      .      .      .      .
Green    .      .      .      *      *      *
Active   .      .      .      *      *      *

```

### show chassis craft-interface (M160 Router)

```
user@host> show chassis craft-interface
```

```
FPM Display contents:
```

```

+-----+
|hosts          |
|Up: 1+16:46    |
|               |
|Fans OK       |
+-----+

```

```
Front Panel System LEDs:
```

```
Host      0      1
```

```

-----
OK         .      *
Fail       .      .
Master     .      *

```

```
Front Panel Alarm Indicators:
```

```

-----
Red LED    .
Yellow LED .
Major relay.
Minor relay.

```

```
Front Panel FPC LEDs:
```

```
FPC      0      1      2      3      4      5      6      7
```

```

-----
Red      .      .      .      .      .      .      .
Green    *      *      .      .      .      .      .

```

```
MCS and SFM LEDs:
```

```
MCS      0      1      SFM      0      1      2      3
```

```

-----
Amber     .              .
Green     .              .
Blue      *              *      *

```

### show chassis craft-interface (MX150)

```
user@host > show chassis craft-interface
```

```
LED status for: FPC 0
```

```
LEDs status:
```

```

Alarm LED : Off
System LED: Green

```

Master LED: Green		
Interface	STATUS LED	LINK/ACTIVITY LED
ge-0/0/0	N/A	(null)
lc-0/0/0	(null)	(null)
ge-0/0/10	N/A	(null)
gr-0/0/10	N/A	(null)
ip-0/0/10	N/A	(null)
vt-0/0/10	N/A	(null)
ge-0/0/11	N/A	(null)

### show chassis craft-interface (MX104 Router)

```
user@host > show chassis craft-interface
```

Front Panel System LEDs:

Routing Engine    0    1

```
-----
OK                *   .
Fail              .   .
Master            *   .
```

Front Panel Alarm Indicators:

```
-----
Red LED           .
Yellow LED        *
Major relay       .
Minor relay       *
```

Input relay:

```
-----
Port  Mode  Status
0     Open  Clear
1     Open  Clear
2     Open  Clear
3     Open  Clear
```

Output relay:

```
-----
Port  Mode  Status
0     Open  Clear
1     Open  Clear
```

PS Status:

PS    0    1

```
-----
Red    .   .
Green  *   .
```

### show chassis craft-interface (MX2010 Router)

```
user@host > show chassis craft-interface
```

Front Panel System LEDs:

Routing Engine    0    1

```
-----
OK                *   .
Fail              .   *
```

```

Master          *      .

Front Panel Alarm Indicators:
-----
Red LED        .
Yellow LED     *
Major relay    .
Minor relay    *

Front Panel FPC LEDs:
FPC    0    1    2    3    4    5    6    7    8    9
-----
Red     .    .    .    .    .    .    .    .    .    .
Green  *    *    .    .    .    .    .    .    *    *

CB LEDs:
CB     0    1
-----
Amber   .    .
Green  *    *

PS LEDs:
PS     0    1    2    3    4    5    6    7    8
-----
Red     .    .    .    .    .    .    .    .    .
Green   .    .    .    .    *    *    *    *    *

Fan Tray LEDs:
FT     0    1    2    3
-----
Red     .    .    .    .
Green  *    *    *    *

Front Panel SFB LEDs:
SFB    0    1    2    3    4    5    6    7
-----
Red     .    .    .    .    .    .    .    .
Green  *    *    *    *    *    *    *    *

Front Panel Chassis Info:
Chassis Number    0x0
Chassis Role      S

```

### show chassis craft-interface (MX2020 Router)

```
user@host > show chassis craft-interface
```

```

Front Panel System LEDs:
Routing Engine 0 1
-----
OK * *
Fail . .
Master * .
Front Panel Alarm Indicators:
-----
Red LED .
Yellow LED .
Major relay .
Minor relay .

```

```

Front Panel FPC LEDs:
FPC 0 1 2 3 4 5 6 7 8 9
-----
Red . . . . .
Green * * * * *
Front Panel FPC LEDs:
FPC 10 11 12 13 14 15 16 17 18 19
-----
Red . . . . .
Green * * * * *
CB LEDs:
CB 0 1
-----
Amber . .
Green * *
PS LEDs:
PS 0 1 2 3 4 5 6 7 8
-----
Red . . . . .
Green * * * * * . * *
PS LEDs:
PS 9 10 11 12 13 14 15 16 17
-----
Red . . . . .
Green * * * * *
Fan Tray LEDs:
FT 0 1 2 3
-----
Red . . . .
Green * * * *
Front Panel SFB LEDs:
SFB 0 1 2 3 4 5 6 7
-----
Red . . . . .
Green * * * * *
Front Panel Chassis Info:
Chassis Number 0x57
Chassis Role M

```

### show chassis craft-interface (MX2008 Router)

```

user@host> show chassis craft-interface

Front Panel System LEDs:
Routing Engine    0    1
-----
OK                *    *
Fail              .    .
Master           *    .

Front Panel Alarm Indicators:
-----
Red LED          .
Yellow LED       .
Major relay      .
Minor relay      .

Front Panel FPC LEDs:
FPC  0    1    2    3    4    5    6    7    8    9
-----

```



```

Red      .      .      .      .      .      .      .      .      .      .
Green    *      *      .      .      .      .      .      *      .      .

CB LEDs:
  CB      0      1
-----
Amber     .      .
Green     *      *

PS LEDs:
  PS      0      1      2      3      4      5      6      7      8
-----
Red      .      .      .      .      .      .      .      .      .
Green     .      *      *      *      *      *      *      *      .

Fan Tray LEDs:
  FT      0      1
-----
Red      .      .
Green     *      *

Front Panel SFB LEDs:
SFB      0      1      2      3      4      5      6      7
-----
Red      .      .      .      .      .      .      .      .
Green     *      *      *      *      *      *      *      *

Front Panel Chassis Info:
Chassis Number    0x36
Chassis Role      M

```

### show chassis craft-interface (T4000 Router)

```
user@host> show chassis craft-interface
```

```

FPM Display contents:
+-----+
|stymphalian      |
|2 Alarms active  |
|R: Front Top Fan Tra|
|Y: PEM 1 Absent  |
+-----+

Front Panel System LEDs:
Routing Engine    0      1
-----
OK                *      *
Fail              .      .
Master            *      .

Front Panel Alarm Indicators:
-----
Red LED           *
Yellow LED        *
Major relay       *
Minor relay       *

Front Panel FPC LEDs:
FPC      0      1      2      3      4      5      6      7
-----

```

```

Red      .   .   .   .   .   .   .   .
Green    *   .   .   *   .   *   *   .

CB LEDs:
  CB    0   1
-----
Amber    .   .
Green    *   *
Blue     *   .

SCG LEDs:
  SCG   0   1
-----
Amber    .   .
Green    *   *
Blue     *   .

SIB LEDs:
  SIB   0   1   2   3   4
-----
Red      .   .   .   .   .
Green    *   *   *   *   *

```

#### show chassis craft-interface (TX Matrix Routing Matrix)

```
user@host> show chassis craft-interface
```

```
scc-re0:
```

```
-----
FPM Display contents:
```

```

+-----+
|bradley      |
|8 Alarms active|
|R: SIB 2 Absent|
|R: SIB 1 Absent|
+-----+

```

```
Front Panel System LEDs:
```

```
Routing Engine    0   1
```

```
-----
OK                  *   .
Fail                .   .
Master              *   .

```

```
Front Panel Alarm Indicators:
```

```
-----
Red LED            *
Yellow LED         *
Major relay        *
Minor relay        *

```

```
CB LEDs:
```

```
  CB    0   1
```

```
-----
Amber    .   .
Green    *   .
Blue     *   .

```

```
SIB LEDs:
```

```
  SIB   0   1   2   3   4
```

```

-----
Fail . . . . .
OK . . . . . *
Active . . . . . *

lcc0-re0:
-----
FPM Display contents:
+-----+
|hybrid          |
|5 Alarms active |
|R: SIB 2 Absent |
|R: SIB 1 Absent |
+-----+
Front Panel System LEDs:
Routing Engine    0    1
-----
OK                * .
Fail              . .
Master            * .

Front Panel Alarm Indicators:
-----
Red LED          *
Yellow LED       *
Major relay      *
Minor relay      *

Front Panel FPC LEDs:
FPC    0    1    2    3    4    5    6    7
-----
Red    . . . . .
Green  *  *  . . . .

CB LEDs:
CB    0    1
-----
Amber. .
Green * .
Blue  * .

SCG LEDs:
SCG   0    1
-----
Amber. .
Green * .
Blue  * .

SIB LEDs:
SIB   0    1    2    3    4
-----
Red   . . . . .
Green . . . . *

lcc2-re0:
-----
FPM Display contents:
+-----+
|prius           |
|5 Alarms active |
+-----+

```

```

|R: SIB 2 Absent      |
|R: SIB 1 Absent      |
+-----+

Front Panel System LEDs:
Routing Engine    0    1
-----
OK                *    .
Fail              .    .
Master           *    .

Front Panel Alarm Indicators:
-----
Red LED          *
Yellow LED       *
Major relay      *
Minor relay      *

Front Panel FPC LEDs:
FPC    0    1    2    3    4    5    6    7
-----
Red    .    .    .    .    .    .    .    .
Green  *    *    *    .    .    .    .    .

CB LEDs:
CB    0    1
-----
Amber. .
Green * .
Blue  * .

SCG LEDs:
SCG   0    1
-----
Amber. .
Green * .
Blue  * .

SIB LEDs:
SIB   0    1    2    3    4
-----
Red   .    .    .    .    .
Green .    .    .    *    .

```

### show chassis craft-interface (TX Matrix Plus Routing Matrix)

```
user@host> show chassis craft-interface
```

```
sfc0-re0:
```

```
-----
FPM Display Contents:
```

```

+-----+
|noname      |
|12 Alarms active |
|R: SIB F13 12 Absent|
|R: SIB F13 9 Absent |
+-----+

```

```

SFC Front Panel Switch Settings:
SFC Chassis Number : 00

```

```

Config Size           : 1

Front Panel System LEDs:
Routing Engine    0    1
-----
OK                *    *
Fail              .    .
Master            *    .

Front Panel Alarm Indicators:
-----
Red LED          *
Yellow LED       *
Major relay      *
Minor relay      *

Front Panel F13 SIB LEDs:
SIB    0    1    2    3    4    5    6    7    8    9    10   11   12   13   14   15
-----
Fail    .    .    .    .    .    .    .    .    .    .    .    .    .    .    .    .
OK       *    .    .    *    .    .    *    .    *    .    .    *    .    .    .    .
Active  .    .    .    *    .    .    *    .    *    .    .    *    .    .    .    .

PS LEDs:
PS      0    1
-----
Red     .    *
Green   *    .

Fan Tray LEDs:
FT      0    1    2    3    4    5
-----
Red     .    .    .    .    *    *
Green   *    *    *    *    .    .

CB LEDs:
CB      0    1
-----
Amber   .    .
Green   *    *
Blue    *    .

1cc0-re0:
-----
FPM Display contents:
+-----+
|noname1          |
|1 Alarm active    |
|R: PEM 1 Not OK   |
|                  |
+-----+

Front Panel System LEDs:
Routing Engine    0    1
-----
OK                *    *
Fail              .    .
Master            *    .

Front Panel Alarm Indicators:

```

```

-----
Red LED      *
Yellow LED   .
Major relay  *
Minor relay   .

Front Panel FPC LEDs:
FPC    0    1    2    3    4    5    6    7
-----
Red     .    .    .    .    .    .    .    .
Green   .    *    .    *    *    .    .    *

CB LEDs:
CB     0    1
-----
Amber   .    .
Green   *    *
Blue    *    .

SCG LEDs:
SCG    0    1
-----
Amber   .    .
Green   *    *
Blue    *    .

SIB LEDs:
SIB    0    1    2    3    4
-----
Red     .    .    .    .    .
Green   *    *    *    *    *

lcc1-re0:
-----
FPM Display contents:
+-----+
|noname2      |
|2 Alarms active|
|R: FPC 0 PIC 0 Failu|
|R: PEM 1 Not OK  |
+-----+

Front Panel System LEDs:
Routing Engine    0    1
-----
OK                *    *
Fail              .    .
Master            *    .

Front Panel Alarm Indicators:
-----
Red LED      *
Yellow LED   .
Major relay  *
Minor relay   .

Front Panel FPC LEDs:
FPC    0    1    2    3    4    5    6    7
-----
Red     .    .    .    .    .    .    .    .

```

```
Green * * * . . * . .
```

```
CB LEDs:
```

```
CB 0 1
```

```
Amber . .
```

```
Green * *
```

```
Blue * .
```

```
SCG LEDs:
```

```
SCG 0 1
```

```
Amber . .
```

```
Green * *
```

```
Blue * .
```

```
SIB LEDs:
```

```
SIB 0 1 2 3 4
```

```
Red . . . . .
```

```
Green * * * * *
```

### show chassis craft-interface (TX Matrix Plus router with 3D SIBs)

```
user@host> show chassis craft-interface
```

```
sfc0-re0:
```

```
-----  
FPM Display Contents:
```

```
+-----+  
|noname      |  
|48 Alarms active |  
|R: LCC 2 Major Error|  
|R: LCC 0 Major Error|  
+-----+
```

```
SFC Front Panel Switch Settings:
```

```
SFC Chassis Number : 00
```

```
Config Size : 3
```

```
Front Panel System LEDs:
```

```
Routing Engine 0 1
```

```
-----  
OK * *
```

```
Fail . .
```

```
Master * .
```

```
Front Panel Alarm Indicators:
```

```
-----  
Red LED *
```

```
Yellow LED *
```

```
Major relay *
```

```
Minor relay *
```

```
Front Panel F13 SIB LEDs:
```

```
SIB 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
```

```
-----  
Fail . . . . .
```

```
OK * . . * . . * . . . . . . . . . .
```

```
Active * . . * . . * . . . . . . . . . .
```

## PS LEDs:

PS	0	1
Red	*	.
Green	.	*

Red	*	.
Green	.	*

## Fan Tray LEDs:

FT	0	1	2	3	4	5
Red	.	.	.	.	.	*
Green	*	*	*	*	*	.

Red	.	.	.	.	.	*
Green	*	*	*	*	*	.

## CB LEDs:

CB	0	1
Amber	.	.
Green	*	*
Blue	*	.

Amber	.	.
Green	*	*
Blue	*	.

## lcc0-re0:

## FPM Display contents:

```

+-----+
|noname1      |
|14 Alarms active|
|R: PEM 1 Not OK|
|R: FPC 7 misconfig|
+-----+

```

## Front Panel System LEDs:

Routing Engine	0	1
OK	*	*
Fail	.	.
Master	*	.

OK	*	*
Fail	.	.
Master	*	.

## Front Panel Alarm Indicators:

Red LED	*
Yellow LED	*
Major relay	*
Minor relay	*

## Front Panel FPC LEDs:

FPC	0	1	2	3	4	5	6	7
Red	.	.	.	.	.	.	.	.
Green	.	.	.	.	*	.	.	.

Red	.	.	.	.	.	.	.	.
Green	.	.	.	.	*	.	.	.

## CB LEDs:

CB	0	1
Amber	.	.
Green	*	*
Blue	*	.

Amber	.	.
Green	*	*
Blue	*	.

## SCG LEDs:

SCG	0	1
-----	---	---



```

Amber . .
Green * *
Blue * .

SIB LEDs:
  SIB 0 1 2 3 4
-----
Red . . . . .
Green * * * . .

```

### show chassis craft-interface (ACX2000 Universal Metro Router)

```
user@host> show chassis craft-interface
```

```

Front Panel System LEDs:
Routing Engine
-----
OK .
Fail .

Front Panel Alarm Indicators:
-----
Red LED .
Yellow LED .
Major relay .
Minor relay .

Input relay:
-----
Port Mode Status
0 Open Clear
1 Open Clear
2 Open Clear
3 Open Clear

Output relay:
-----
Port Mode Status
0 Open Clear
1 Open Clear

PS Status:
PS 0 1
-----
Red . .
Green * *

```

### show chassis craft-interface (ACX500 Router)

```
user@host> show chassis craft-interface
```

```

Front Panel System LEDs:
Routing Engine
-----
OK .
Fail .

Front Panel Alarm Indicators:

```

```
-----
Red LED      .
Yellow LED   .
Major relay   .
Minor relay   .

Input relay:
-----
Port    Mode    Status
0       Open    Clear
1       Open    Clear
2       Open    Clear
3       Open    Clear

Output relay:
-----
Port    Mode    Status
0       Open    Clear
1       Open    Clear

PS Status:
PS      0      1
-----
Red      .      .
Green    *      *
```

## show chassis environment

<b>List of Syntax</b>	Syntax on page 969
	Syntax (T320, T640, T1600, and T4000 Routers) on page 969
	Syntax (TX Matrix Routers) on page 969
	Syntax (TX Matrix Plus Routers) on page 969
	Syntax (MX Series Routers) on page 970
	Syntax (MX104 Universal Routing Platforms) on page 970
	Syntax (MX150 Router Appliance) on page 970
	Syntax (MX2010, MX2020, and MX2008 Universal Routing Platforms) on page 970
	Syntax (MX10003 and MX204 Universal Routing Platforms) on page 970
	Syntax (EX8200 Switches) on page 970
	Syntax (EX Series Switches except EX8200) on page 971
	Syntax (QFX Series) on page 971
	Syntax (OCX Series) on page 971
	Syntax (PTX Series Packet Transport Routers) on page 971
	Syntax (ACX Series Universal Metro Routers) on page 971
	Syntax (ACX5048 and ACX5096 Routers) on page 971
	Syntax (ACX500 Routers) on page 971

<b>Syntax</b>	<b>show chassis environment</b>
---------------	---------------------------------

<b>Syntax (T320, T640, T1600, and T4000 Routers)</b>	show chassis environment <cb <i>cb-slot-number</i> > <fpc <i>fpc-slot-number</i> > <fpm> <pem <i>pem-slot-number</i> > <routing-engine <i>re-slot-number</i> > <scg <i>scg-slot-number</i> > <sib <i>sib-slot-number</i> >
--	---

<b>Syntax (TX Matrix Routers)</b>	show chassis environment <lcc <i>number</i>   scc>
-----------------------------------	---

<b>Syntax (TX Matrix Plus Routers)</b>	show chassis environment <cb <i>cb-slot-number</i> > <cip <i>cip-slot-number</i> > <fpc <i>fpc-slot-number</i> > <fpm> <lcc <i>number</i> > <pem <i>pem-slot-number</i> > <routing-engine <i>re-slot-number</i> > <scg <i>scg-slot-number</i> > < sfc <i>number</i> > <sib <i>sib-slot-number</i> >
--	---

Syntax (MX Series Routers)	<pre>show chassis environment &lt;all-members&gt; &lt;local&gt; &lt;member <i>member-id</i>&gt;</pre>
Syntax (MX104 Universal Routing Platforms)	<pre>show chassis environment &lt;cb&gt; &lt;pem <i>pem-slot-number</i>&gt; &lt;routing-engine <i>re-slot-number</i>&gt;</pre>
Syntax (MX150 Router Appliance)	<pre>show chassis environment &lt;pem <i>pem-slot-number</i>&gt; &lt;routing-engine <i>re-slot-number</i>&gt;</pre>
Syntax (MX2010, MX2020, and MX2008 Universal Routing Platforms)	<pre>show chassis environment &lt;adc <i>adc-slot-number</i>&gt; &lt;all-members&gt; &lt;cb <i>cb-slot-number</i>&gt; &lt;fan <i>fantray-slot-number</i>&gt; &lt;fpc <i>fpc-slot-number</i>&gt; &lt;fpm&gt; &lt;local&gt; &lt;member <i>member-id</i>&gt; &lt;monitored&gt; &lt;psm <i>psm-slot-number</i>&gt; &lt;routing-engine <i>re-slot-number</i>&gt; &lt;sfb <i>sfb-slot-number</i>&gt; &lt;satellite [<i>fpc-slot slot-id</i> [<i>device-alias alias-name</i>]]&gt;</pre>
Syntax (MX10003 and MX204 Universal Routing Platforms)	<pre>show chassis environment &lt;cb <i>cb-slot-number</i>&gt; &lt;fpc <i>fpc-slot-number</i>&gt; &lt;pem <i>pem-slot-number</i>&gt; &lt;routing-engine <i>re-slot-number</i>&gt;</pre>
Syntax (EX8200 Switches)	<pre>show chassis environment &lt;all-members&gt; &lt;cb <i>cb-slot-number</i>&gt; &lt;fpc <i>fpc-slot-number</i>&gt; &lt;local&gt; &lt;member <i>member-id</i>&gt; &lt;psu <i>psu-slot-number</i>&gt; &lt;routing-engine <i>re-slot-number</i>&gt;</pre>

Syntax (EX Series Switches except EX8200)	<pre> show chassis environment &lt;all-members&gt; &lt;fpc fpc-slot-number&gt; &lt;local&gt; &lt;member member-id&gt; &lt;power-supply-unit&gt; &lt;routing-engine&gt; &lt;satellite [fpc-slot slot-id  device-alias alias-name]&gt; </pre>
Syntax (QFX Series)	<pre> show chassis environment &lt;cb slot-number &lt;interconnect-device name&gt;&gt; &lt;fpc slot-number &lt;interconnect-device name&gt;&gt; &lt;interconnect-device name &lt;slot-number&gt; &lt;node-device name&gt; &lt;pem slot-number (interconnect-device name slot-number)   (node-device name)&gt; &lt;routing-engine name &lt;interconnect-device name slot-number&gt;&gt; </pre>
Syntax (OCX Series)	<pre> show chassis environment </pre>
Syntax (PTX Series Packet Transport Routers)	<pre> show chassis environment &lt;cb cb-slot-number&gt; &lt;ccg ccg-slot-number &gt; &lt;fpc fpc-slot-number&gt; &lt;fpm&gt; &lt;monitored&gt; &lt;pdu pdu-slot-number&gt; &lt;routing-engine re-slot-number&gt; &lt;sib sib-slot-number&gt; </pre>
Syntax (ACX Series Universal Metro Routers)	<pre> show chassis environment &lt;cb cb-slot-number&gt; &lt;pem pem-slot-number&gt; &lt;routing-engine re-slot-number&gt; </pre>
Syntax (ACX5048 and ACX5096 Routers)	<pre> show chassis environment &lt;fpc slot-number&gt; &lt;pem&gt; &lt;routing-engine&gt; </pre>
Syntax (ACX500 Routers)	<pre> show chassis environment &lt;cb cb-slot-number&gt; &lt;routing-engine re-slot-number&gt; </pre>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p>

**sfc** option introduced for the TX Matrix Plus router in Junos OS Release 9.6.  
Command introduced in Junos OS Release 11.1 for QFX Series.  
Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.  
**monitored** option added in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.  
Command introduced in Junos OS Release 12.1 for T4000 Core Routers.  
Command introduced in Junos OS Release 12.2 for ACX Series Universal Metro Routers.  
Command introduced in Junos OS Release 12.3 for MX 2020 and MX2010 Universal Routing Platforms.  
**pem** option introduced in Junos OS Release 12.3 for ACX4000 Universal Metro Routers.  
**satellite** option introduced in Junos OS Release 14.2R3.  
**all-members**, **local**, and **member** *member-id* options introduced in Junos OS Release 15.1 for MX2010 and MX2020 routers.  
Command introduced in Junos OS Release 15.1X54-D20 for ACX5048 and ACX5096 Routers.  
Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.  
Command introduced in Junos OS Release 17.3 for MX150 Router Appliance.  
Command introduced in Junos OS Release 17.2 for PTX10008 Routers.  
Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.  
Command introduced in Junos OS Release 17.4 for MX204 Universal Routing Platforms.  
Command introduced in Junos OS Release 18.1R1 for EX9251 Switches.  
Command introduced in Junos OS Release 18.2 for EX9253 Switches.  
Command introduced in Junos OS Release 18.2R1 for MX10008 Routers.

**Description** Display environmental information about the router or switch chassis, including the temperature and information about the fans, power supplies, and Routing Engine.

In addition, on ACX4000 routers, display temperature information about the different channels of a Modular Interface Card (MIC). The number of channels displayed depends on the type of MIC installed.

Starting with Junos OS Release 14.1, the **show chassis environment cb cb-slot-number | ccg ccg-slot-number | fpc fpc-slot-number | fpm | monitored | pdu pdu-slot-number | routing-engine re-slot-number | sib sib-slot-number** operational mode command output displays environmental information for the new DC power supply module (PSM) and power distribution unit (PDU) that are added to provide power to the high-density FPC (FPC2-PTX-PIA) and other components in a PTX5000 Packet Transport Router.

**Options** **none**—Display environmental information about the router or switch chassis. On a TX Matrix router, display environmental information about the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display environmental information about the TX Matrix Plus router and its attached routers.

**all-members**—(MX Series routers and EX Series switches only) (Optional) Display chassis environmental information for all the members of the Virtual Chassis configuration.

**adc adc-slot-number**—(MX2010, MX2020, and MX2008 routers only) (Optional) Display chassis environmental information for the adapter cards. For MX2020 routers, replace

**adc-slot-number** with a value from 0 through 19. For MX2010 and MX2008 routers, replace **adc-slot-number** with a value from 0 through 9.

**cb cb-slot-number**—(ACX Series Universal Metro Routers, EX Series switches, M120, M320, and M40e routers, MX Series routers, MX2020 routers, MX2010 routers, MX2008 routers, PTX Series Packet Transport Routers, QFX Series, and T Series routers, and TX Matrix Plus routers only) (Optional) Display chassis environmental information for the Control Board. On devices other than EX Series switches, replace **cb-slot** with 0 or 1.

**cip cip-slot-number**—(TX Matrix Plus routers only) (Optional) Display chassis environmental information for the Connection Interface Panel (CIP). Replace the **cip-slot-number** variable with a value of 0 or 1.

**cb interconnect-device name**—(QFabric systems only) (Optional) Display chassis environmental information for the Control Board on an Interconnect device.

**ccg ccg-slot-number**—(PTX Series only) (Optional) Display chassis environmental information for the Centralized Clock Generator. Replace **cb-slot** with a value of 0 or 1.

**fan fantray-slot-number**—(MX2010, MX2020, and MX2008 routers only) (Optional) Display chassis environmental information for the fan trays. Replace **fantray-slot-number** with a value from 0 through 3.

**fpc fpc-slot**—(EX Series switches, M120, M320, and M40e routers, MX Series routers, MX2010 routers, MX2020 routers, MX2008 routers, PTX Series Packet Transport Routers, QFX Series, QFX3500 switches, QFabric systems, T Series routers, and TX Matrix Plus routers) (Optional) Display chassis environmental information for a specified Flexible PIC Concentrator. For MX2010 and MX2008 routers, replace **fpc-slot** with a value from 0 through 9. For MX2020 routers, replace **fpc-slot** with a value from 0 through 19. For information about FPC numbering, see [show chassis environment fpc](#). On a QFabric system, display chassis environmental information for a specified Flexible PIC Concentrator on an Interconnect device. On an EX Series switch, display chassis environmental information for a specified Flexible PIC Concentrator; see the hardware documentation for your switch for information on FPC numbering. On a TX Matrix Plus router with 3D SIBs replace **fpc-slot** with a value from 0 through 63.

**fpm**—(M120, M320, and M40e routers, MX2010 routers, MX2020 routers, MX2008 routers, PTX Series, Packet Transport Routers, T Series routers, and TX Matrix Plus routers only) (Optional) Display chassis environmental information for the craft interface (FPM).

**interconnect-device name**—(QFabric systems only) (Optional) Display chassis environmental information for the Interconnect device.

**lcc number**—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers and EX Series switches only) (Optional) Display chassis environmental information for the local Virtual Chassis member.

**member *member-id***—(MX Series routers and EX Series switches only) (Optional) Display chassis environmental information for the specified member of the Virtual Chassis configuration. On MX Series routers, replace *member-id* with a value of **0** or **1**. For EX Series switches, see [member](#) for member ID values.

**monitored**—(MX2020 routers and PTX Series Packet Transport Routers only) (Optional) Display chassis environmental information for monitored temperatures only. Temperatures that are not included in temperature alarm computations are not displayed.

**node-device *name***—(QFabric systems only) (Optional) Display chassis environmental information for the Node device.

**pdu *pdu-slot-number***—(PTX Series only) (Optional) Display chassis environmental information for the specified power distribution unit.

**pem**—(QFX3500 switches and QFabric systems only) (Optional) Display chassis environmental information for the Power Entry Module on the specified Interconnect device or Node device.

**pem *pem-slot-number***—(ACX Series Universal Metro Routers, M120, M320, and M40e routers, MX Series routers, MX104 routers, QFX Series, and T Series routers only) (Optional) Display chassis environmental information for the Power Entry Module on the specified Power Entry Module. For information about the options, see [show chassis environment pem](#).

**psm *psm-slot-number***—(MX2010, MX2020, and MX2008 routers only) (Optional) Display chassis environmental information for the power supply module. For MX2020 routers, replace *psm-slot-number* with a value from **0** through **17**. For MX2010 and MX2008 routers, replace *psm-slot-number* with a value from **0** through **8**.

**psu *psu-slot-number***—(EX Series switches only) (Optional) Display chassis environmental information for a specified power supply.



**routing-engine**—(QFX3500 switches and QFabric systems only) (Optional) Display chassis environmental information for the Routing Engine on the specified Interconnect device.

**routing-engine *re-slot-number***—(Optional) Display chassis environmental information for the specified Routing Engine. For information about the options, see [show chassis environment routing-engine](#).

**satellite [*fpc-slot slot-id* | *device-alias alias-name*]**—(Junos Fusion only)(Optional) Display chassis environmental information for the specified satellite device in a Junos Fusion, or for all satellite devices in the Junos Fusion if no satellite devices are specified.

**scg**—(T Series routers only) (Optional) Display chassis environmental information about the SONET Clock Generator.

**scc**—(TX Matrix routers only) (Optional) Display chassis environmental information about the TX Matrix router (switch-card chassis).

**sfb *sfb-slot-number***—(MX2010, MX2020, and MX2008 routers only) (Optional) Display chassis environmental information for the switch fabric board. Replace *sfb-slot-number* with a value from 0 through 7.

**sfc *number***—(TX Matrix Plus routers only) (Optional) Display chassis environmental information about the respective TX Matrix Plus router ( switch-fabric chassis). Replace *number* variable with 0.

**sib *sib-slot-number***—(M320 routers, PTX Series Packet Transport Routers, and T Series routers only) (Optional) Display chassis environmental information about the specified switch interface board. For information about the options, see [show chassis environment sib](#).

**Required Privilege Level** view

**Related Documentation**

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- [show chassis environment cb on page 1066](#)
- [show chassis environment ccg on page 1093](#)
- [show chassis environment cip](#)
- [show chassis environment fpc on page 1099](#)
- [show chassis environment fpm on page 1150](#)
- [show chassis environment lcc](#)
- [show chassis environment mcs on page 1179](#)
- [show chassis environment monitored on page 1157](#)
- [show chassis environment pcg on page 1204](#)

- [show chassis environment pdu on page 1207](#)
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- [show chassis environment psu on page 1227](#)
- [show chassis environment routing-engine on page 1239](#)
- [show chassis environment scg on page 1248](#)
- [show chassis environment sfb on page 1253](#)
- [show chassis environment sib on page 1271](#)
- [\*show chassis environment sfc\*](#)

**List of Sample Output**

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**Output Fields** [Table 97 on page 978](#) lists the output fields for the **show chassis environment** command. Output fields are listed in the approximate order in which they appear.

Table 97: show chassis environment Output Fields

Field Name	Field Description
<b>Class</b>	<p>Information about the category or class of chassis component:</p> <ul style="list-style-type: none"> <li>• <b>Power:</b> Power information: <ul style="list-style-type: none"> <li>• (M5, M10, M20, and M40 routers and EX Series switches only) Power supply status: <b>OK</b>, <b>Testing</b>, (during initial power-on), <b>Failed</b>, or <b>Absent</b>.</li> <li>• (M7i, M10i, M40e, M120, M160, M320, and T Series routers and EX Series switches only) Power Entry Modules status: <b>OK</b>, <b>Testing</b>, (during initial power-on), <b>Check</b>, <b>Failed</b>, or <b>Absent</b>.</li> <li>• (PTX Series only) Power information is reported in PDU or PSM combinations. The status is: <b>OK</b>, <b>Testing</b>, (during initial power-on), <b>Check</b>, <b>Failed</b>, or <b>Absent</b>.</li> </ul> </li> <li>• <b>Temp:</b> Temperature of air flowing through the chassis in degrees Celsius (C) and Fahrenheit (F). <ul style="list-style-type: none"> <li>• On PTX Series Packet Transport Routers and MX2010, MX2020, and MX2008 Routers, multiple cooling zones are supported. FRU temperatures in each zone are coordinated with the fan speed of fan trays in those zones.</li> <li>• EX2200 switches have a side-to-rear cooling system. The <b>Local Intake</b> temperature is measured by the sensor on the right side of the chassis, and the <b>Remote Intake</b> temperature is measured by the sensor on the left side of the chassis.</li> </ul> </li> <li>• <b>Pic:</b> On ACX4000 routers, multiple temperature channels on a MIC. The status is: <b>OK</b> and the <b>Measurement</b> is in degrees Celsius (C) and Fahrenheit (F).</li> <li>• <b>Fan:</b> Fan status: <b>OK</b>, <b>Testing</b> (during initial power-on), <b>Failed</b>, or <b>Absent</b>. On PTX Series Packet Transport Routers and MX2010, MX2020, and MX2008 Routers, multiple fan trays are supported. Fan status is reported in Fan Tray or Fan combinations. <b>Measurement</b> indicates actual fan RPM (PTX and MX2010, MX2020, and MX2008 Routers only).</li> <li>• <b>Misc:</b> Information about other components of the chassis. <ul style="list-style-type: none"> <li>• On some routers, this field indicates the status of one or more additional components.</li> <li>• On the M40e, M160, and M320 router, <b>Misc</b> includes <b>CIP</b> (Connector Interface Panel). <b>OK</b> indicates that the CIP is present. <b>Absent</b> indicates that the CIP is not present.</li> <li>• On T Series routers, <b>Misc</b> includes <b>CIP</b> and <b>SPMB</b> (Switch Processor Mezzanine Board). <b>OK</b> indicates that the <b>CIP</b> or <b>SPMB</b> is present. <b>Absent</b> indicates that the <b>CIP</b> or <b>SPMB</b> is not present.</li> <li>• On PTX Series Packet Transport Routers, <b>Misc</b> includes the <b>SPMB</b> (Switch Processor Mezzanine Board). The SPMB is located on the control boards. <b>OK</b> indicates that the control board is present. <b>Absent</b> indicates that the control board is not present.</li> </ul> </li> </ul>
<b>Item</b>	<p>(MX2010, MX2020, and MX2008 Routers) Information about the chassis component: Routing Engines, Controls Boards (CBs), Switch Fabric Boards (SFBs), PICs, Flexible PIC Concentrators (FPCs), and Adapter Cards (ADCs).</p> <p>(MX104 Routers) Information about the chassis components: Routing Engines, Control Board (CB), Power Entry Module (PEM), and Compact Forwarding Engine Board (AFEB).</p> <p>(QFabric Systems) Information about the chassis component: Control Boards, Routing Engines, Flexible PIC Concentrators (FPCs), and Power Entry Modules (PEMs), Node Devices, and Interconnect Devices.</p> <p>(QFX Series) Information about the chassis component: Flexible PIC Concentrators (FPCs), and Power Entry Modules (PEMs).</p>

Table 97: show chassis environment Output Fields (continued)

Field Name	Field Description
<b>Status</b>	<p>(MX104, MX2010, MX2020, and MX2008 Routers) Status of the specified chassis component. For example, if the Class is Fan, the fan status can be:</p> <ul style="list-style-type: none"> <li>• <b>OK:</b> The fans are operational.</li> <li>• <b>Testing:</b> The fans are being tested during initial power-on.</li> <li>• <b>Failed:</b> The fans have failed or the fans are not spinning.</li> <li>• <b>Absent:</b> The fan tray is not installed.</li> </ul> <p>If the Class is Power, the power supply status can be:</p> <ul style="list-style-type: none"> <li>• <b>OK:</b> The power component is operational.</li> <li>• <b>Testing:</b> The power component is being tested during initial power-on.</li> <li>• <b>Check:</b> There is insufficient power---that is, fewer than the minimum required feeds are connected.</li> <li>• <b>Failed:</b> The inputs leads have failed.</li> <li>• <b>Absent:</b> The power component is not installed.</li> </ul>
<b>Measurement</b>	<p>(MX104, MX2010, MX2020, and MX2008 Routers) Dependant on the Class. For example, if the Class is Temp, indicates the temperature in degree Celsius and degrees Fahrenheit. If the Class is Fan, indicates actual fan RPM.</p>

## Sample Output

### show chassis environment (M5 Router)

```

user@host> show chassis environment

Class Item           Status Measurement
Power Power Supply A   OK
      Power Supply B   Absent
Temp  FPC 0            OK      30 degrees C / 86 degrees F
      FEB             OK      33 degrees C / 91 degrees F
      PS Intake        OK      27 degrees C / 80 degrees F
      PS Exhaust       OK      27 degrees C / 80 degrees F
      Routing Engine    OK      34 degrees C / 93 degrees F
Fans  Left Fan 1       OK      Spinning at normal speed
      Left Fan 2       OK      Spinning at normal speed
      Left Fan 3       OK      Spinning at normal speed
      Left Fan 4       OK      Spinning at normal speed
Misc  Craft Interface  OK

```

### show chassis environment (M7i Router)

```

user@host> show chassis environment

Class Item           Status Measurement
Power Power Supply 0   OK
      Power Supply 1   Absent
Temp  Intake           OK      22 degrees C / 71 degrees F
      FPC 0            OK      23 degrees C / 73 degrees F
      Power Supplies    OK      23 degrees C / 73 degrees F
      CFEB Intake       OK      24 degrees C / 75 degrees F
      CFEB Exhaust      OK      29 degrees C / 84 degrees F

```

	Routing Engine	OK	26 degrees C / 78 degrees F
Fans	Fan 1	OK	Spinning at normal speed
	Fan 2	OK	Spinning at normal speed
	Fan 3	OK	Spinning at normal speed
	Fan 4	OK	Spinning at normal speed

### show chassis environment (M10 Router)

```
user@host> show chassis environment
```

Class	Item	Status	Measurement
Power	Power Supply A	OK	
	Power Supply B	Failed	
Temp	FPC 0	OK	36 degrees C / 96 degrees F
	FPC 1	OK	35 degrees C / 95 degrees F
	FEB	OK	34 degrees C / 93 degrees F
	PS Intake	OK	31 degrees C / 87 degrees F
	PS Exhaust	OK	34 degrees C / 93 degrees F
	Routing Engine	OK	35 degrees C / 95 degrees F
Fans	Left Fan 1	OK	Spinning at normal speed
	Left Fan 2	OK	Spinning at normal speed
	Left Fan 3	OK	Spinning at normal speed
	Left Fan 4	OK	Spinning at normal speed
Misc	Craft Interface	OK	

### show chassis environment (M10i Router)

```
user@host> show chassis environment
```

Class	Item	Status	Measurement
Power	Power Supply 0	OK	
	Power Supply 1	OK	
	Power Supply 2	Absent	
	Power Supply 3	Absent	
Temp	Intake	OK	26 degrees C / 78 degrees F
	FPC 0	OK	27 degrees C / 80 degrees F
	FPC 1	OK	28 degrees C / 82 degrees F
	Lower Power Supplies	OK	29 degrees C / 84 degrees F
	Upper Power Supplies	OK	28 degrees C / 82 degrees F
	CFEB Intake	OK	27 degrees C / 80 degrees F
	CFEB Exhaust	OK	36 degrees C / 96 degrees F
	Routing Engine 0	OK	31 degrees C / 87 degrees F
	Routing Engine 1	OK	27 degrees C / 80 degrees F
Fans	Fan Tray 0 Fan 1	OK	Spinning at normal speed
	Fan Tray 0 Fan 2	OK	Spinning at normal speed
	Fan Tray 0 Fan 3	OK	Spinning at normal speed
	Fan Tray 0 Fan 4	OK	Spinning at normal speed
	Fan Tray 0 Fan 5	OK	Spinning at normal speed
	Fan Tray 0 Fan 6	OK	Spinning at normal speed
	Fan Tray 0 Fan 7	OK	Spinning at normal speed
	Fan Tray 0 Fan 8	OK	Spinning at normal speed
	Fan Tray 1 Fan 1	Absent	
	Fan Tray 1 Fan 2	Absent	
	Fan Tray 1 Fan 3	Absent	
	Fan Tray 1 Fan 4	Absent	
	Fan Tray 1 Fan 5	Absent	
	Fan Tray 1 Fan 6	Absent	

Fan Tray 1 Fan 7	Absent
Fan Tray 1 Fan 8	Absent

### show chassis environment (M20 Router)

```
user@host> show chassis environment
```

Class	Item	Status	Measurement
Power	Power Supply A	OK	
	Power Supply B	Absent	
Temp	FPC 0	OK	28 degrees C / 82 degrees F
	FPC 1	OK	27 degrees C / 80 degrees F
	Power Supply A	OK	22 degrees C / 71 degrees F
	Power Supply B	Absent	
	SSB 0	OK	30 degrees C / 86 degrees F
	Backplane	OK	22 degrees C / 71 degrees F
	Routing Engine 0	OK	26 degrees C / 78 degrees F
Fans	Routing Engine 1	Testing	
	Rear Fan	OK	Spinning at normal speed
	Front Upper Fan	OK	Spinning at normal speed
	Front Middle Fan	OK	Spinning at normal speed
	Front Bottom Fan	OK	Spinning at normal speed
Misc	Craft Interface	OK	

### show chassis environment (M40 Router)

```
user@host> show chassis environment
```

Class	Item	Status	Measurement
Power	Power Supply A	OK	
	Power Supply B	Absent	
Temp	FPC 3	OK	24 degrees C / 75 degrees F
	FPC 6	OK	26 degrees C / 78 degrees F
	SCB	OK	26 degrees C / 78 degrees F
	Backplane @ A1	OK	28 degrees C / 82 degrees F
	Backplane @ A2	OK	23 degrees C / 73 degrees F
	Routing Engine	OK	26 degrees C / 78 degrees F
Fans	Top Impeller	OK	Spinning at normal speed
	Bottom impeller	OK	Spinning at normal speed
	Rear Left Fan	OK	Spinning at normal speed
	Rear Center Fan	OK	Spinning at normal speed
	Rear Right Fan	OK	Spinning at normal speed
Misc	Craft Interface	OK	

### show chassis environment (M40e Router)

```
user@host> show chassis environment
```

Class	Item	Status	Measurement
Power	PEM 0	OK	
	PEM 1	Absent	
Temp	PCG 0	OK	44 degrees C / 111 degrees F
	PCG 1	OK	47 degrees C / 116 degrees F
	Routing Engine 0	OK	40 degrees C / 104 degrees F
	Routing Engine 1	OK	37 degrees C / 98 degrees F
	MCS 0	OK	45 degrees C / 113 degrees F

	MCS 1	OK	42 degrees C / 107 degrees F
	SFM 0 SPP	OK	40 degrees C / 104 degrees F
	SFM 0 SPR	OK	44 degrees C / 111 degrees F
	SFM 1 SPP	OK	43 degrees C / 109 degrees F
	SFM 1 SPR	OK	45 degrees C / 113 degrees F
	FPC 0	OK	38 degrees C / 100 degrees F
	FPC 1	OK	40 degrees C / 104 degrees F
	FPC 2	OK	38 degrees C / 100 degrees F
	FPC 4	OK	34 degrees C / 93 degrees F
	FPC 5	OK	43 degrees C / 109 degrees F
	FPC 6	OK	41 degrees C / 105 degrees F
	FPC 7	OK	43 degrees C / 109 degrees F
	FPM CMB	OK	28 degrees C / 82 degrees F
	FPM Display	OK	28 degrees C / 82 degrees F
Fans	Rear Bottom Blower	OK	Spinning at normal speed
	Rear Top Blower	OK	Spinning at normal speed
	Front Top Blower	OK	Spinning at normal speed
	Fan Tray Rear Left	OK	Spinning at normal speed
	Fan Tray Rear Right	OK	Spinning at normal speed
	Fan Tray Front Left	OK	Spinning at normal speed
	Fan Tray Front Right	OK	Spinning at normal speed
Misc	CIP	OK	

### show chassis environment (M120 Router)

user@host> show chassis environment

Class	Item	Status	Measurement
Temp	PEM 0	OK	
	PEM 1	OK	
	Routing Engine 0	OK	43 degrees C / 109 degrees F
	Routing Engine 1	OK	44 degrees C / 111 degrees F
	CB 0 Intake	OK	33 degrees C / 91 degrees F
	CB 0 Exhaust A	OK	36 degrees C / 96 degrees F
	CB 0 Exhaust B	OK	35 degrees C / 95 degrees F
	CB 1 Intake	OK	34 degrees C / 93 degrees F
	CB 1 Exhaust A	OK	38 degrees C / 100 degrees F
	CB 1 Exhaust B	OK	35 degrees C / 95 degrees F
	FEB 3 Intake	OK	35 degrees C / 95 degrees F
	FEB 3 Exhaust A	OK	37 degrees C / 98 degrees F
	FEB 3 Exhaust B	OK	39 degrees C / 102 degrees F
	FEB 4 Intake	OK	33 degrees C / 91 degrees F
	FEB 4 Exhaust A	OK	39 degrees C / 102 degrees F
	FEB 4 Exhaust B	OK	36 degrees C / 96 degrees F
	FPC 2 Exhaust A	OK	32 degrees C / 89 degrees F
	FPC 2 Exhaust B	OK	31 degrees C / 87 degrees F
	FPC 3 Exhaust A	OK	32 degrees C / 89 degrees F
	FPC 3 Exhaust B	OK	33 degrees C / 91 degrees F
	FPC 4 Exhaust A	OK	32 degrees C / 89 degrees F
	FPC 4 Exhaust B	OK	30 degrees C / 86 degrees F
Fans	Front Top Tray Fan 1	OK	Spinning at normal speed
	Front Top Tray Fan 2	OK	Spinning at normal speed
	Front Top Tray Fan 3	OK	Spinning at normal speed
	Front Top Tray Fan 4	OK	Spinning at normal speed
	Front Top Tray Fan 5	OK	Spinning at normal speed
	Front Top Tray Fan 6	OK	Spinning at normal speed
	Front Top Tray Fan 7	OK	Spinning at normal speed
	Front Top Tray Fan 8	OK	Spinning at normal speed
	Front Bottom Tray Fan 1	OK	Spinning at normal speed



Front Bottom Tray Fan 2	OK	Spinning at normal speed
Front Bottom Tray Fan 3	OK	Spinning at normal speed
Front Bottom Tray Fan 4	OK	Spinning at normal speed
Front Bottom Tray Fan 5	OK	Spinning at normal speed
Front Bottom Tray Fan 6	OK	Spinning at normal speed
Front Bottom Tray Fan 7	OK	Spinning at normal speed
Front Bottom Tray Fan 8	OK	Spinning at normal speed
Rear Top Tray Fan 1	OK	Spinning at normal speed
Rear Top Tray Fan 2	OK	Spinning at normal speed
Rear Top Tray Fan 3	OK	Spinning at normal speed
Rear Top Tray Fan 4	OK	Spinning at normal speed
Rear Top Tray Fan 5	OK	Spinning at normal speed
Rear Top Tray Fan 6	OK	Spinning at normal speed
Rear Top Tray Fan 7	OK	Spinning at normal speed
Rear Top Tray Fan 8	OK	Spinning at normal speed
Rear Bottom Tray Fan 1	OK	Spinning at normal speed
Rear Bottom Tray Fan 2	OK	Spinning at normal speed
Rear Bottom Tray Fan 3	OK	Spinning at normal speed
Rear Bottom Tray Fan 4	OK	Spinning at normal speed
Rear Bottom Tray Fan 5	OK	Spinning at normal speed
Rear Bottom Tray Fan 6	OK	Spinning at normal speed
Rear Bottom Tray Fan 7	OK	Spinning at normal speed
Rear Bottom Tray Fan 8	OK	Spinning at normal speed

### show chassis environment (M160 Router)

```
user@host> show chassis environment
```

Class	Item	Status	Measurement
Power	PEM 0	OK	PEM 1
Temp	PCG 0	OK	45 degrees C / 113 degrees F
	PCG 1	Absent	
	Routing Engine 0	OK	35 degrees C / 95 degrees F
	Routing Engine 1	Absent	
	MCS 0	OK	50 degrees C / 122 degrees F
	SFM 0 SPP	OK	47 degrees C / 116 degrees F
	SFM 0 SPR	OK	49 degrees C / 120 degrees F
	SFM 1 SPP	OK	50 degrees C / 122 degrees F
	SFM 1 SPR	OK	50 degrees C / 122 degrees F
	SFM 2 SPP	OK	51 degrees C / 123 degrees F
	SFM 2 SPR	OK	52 degrees C / 125 degrees F
	SFM 3 SPP	OK	52 degrees C / 125 degrees F
	SFM 3 SPR	OK	48 degrees C / 118 degrees F
	FPC 0	OK	45 degrees C / 113 degrees F
	FPC 6	OK	43 degrees C / 109 degrees F
	FPM CMB	OK	31 degrees C / 87 degrees F
	FPM Display	OK	33 degrees C / 91 degrees F
Fans	Rear Bottom Blower	OK	Spinning at normal speed
	Rear Top Blower	OK	Spinning at normal speed
	Front Top Blower	OK	Spinning at normal speed
	Fan Tray Rear Left	OK	Spinning at normal speed
	Fan Tray Rear Right	OK	Spinning at normal speed
	Fan Tray Front Left	OK	Spinning at normal speed
	Fan Tray Front Right	OK	Spinning at normal speed
Misc	CIP	OK	

## show chassis environment (M320 Router)

user@host&gt; show chassis environment

Class	Item	Status	Measurement
Temp	PEM 0	Absent	
	PEM 1	Absent	
	PEM 2	OK	
	PEM 3	OK	
	Routing Engine 0	OK	33 degrees C / 91 degrees F
	Routing Engine 1	OK	32 degrees C / 89 degrees F
	CB 0	OK	36 degrees C / 96 degrees F
	CB 1	OK	36 degrees C / 96 degrees F
	SIB 0	OK	38 degrees C / 100 degrees F
	SIB 1	OK	29 degrees C / 84 degrees F
	SIB 2	OK	38 degrees C / 100 degrees F
	SIB 3	OK	41 degrees C / 105 degrees F
	FPC 0 Intake	OK	28 degrees C / 82 degrees F
	FPC 0 Exhaust	OK	40 degrees C / 104 degrees F
	FPC 1 Intake	OK	29 degrees C / 84 degrees F
	FPC 1 Exhaust	OK	39 degrees C / 102 degrees F
	FPC 2 Intake	OK	28 degrees C / 82 degrees F
	FPC 2 Exhaust	OK	38 degrees C / 100 degrees F
	FPC 3 Intake	OK	28 degrees C / 82 degrees F
	FPC 3 Exhaust	OK	39 degrees C / 102 degrees F
	FPC 6 Intake	OK	27 degrees C / 80 degrees F
	FPC 6 Exhaust	OK	39 degrees C / 102 degrees F
	FPC 7 Intake	OK	27 degrees C / 80 degrees F
	FPC 7 Exhaust	OK	42 degrees C / 107 degrees F
	FPM GBUS	OK	30 degrees C / 86 degrees F
Fan	Top Left Front fan	OK	Spinning at normal speed
	Top Right Rear fan	OK	Spinning at normal speed
	Top Right Front fan	OK	Spinning at normal speed
	Top Left Rear fan	OK	Spinning at normal speed
	Bottom Left Front fan	OK	Spinning at normal speed
	Bottom Right Rear fan	OK	Spinning at normal speed
	Bottom Right Front fan	OK	Spinning at normal speed
	Bottom Left Rear fan	OK	Spinning at normal speed
	Rear Fan 1 (TOP)	OK	Spinning at normal speed
	Rear Fan 2	OK	Spinning at normal speed
	Rear Fan 3	OK	Spinning at normal speed
	Rear Fan 4	OK	Spinning at normal speed
	Rear Fan 5	OK	Spinning at normal speed
	Rear Fan 6	OK	Spinning at normal speed
	Rear Fan 7 (Bottom)	OK	Spinning at normal speed
Misc	CIP	OK	

## show chassis environment (MX150)

user@host&gt; show chassis environment

Class	Item	Status	Measurement
Power	FPC 0 Power Supply 0	OK	
Temp	FPC 0 Sensor 1	OK	42 degrees C / 107 degrees F
	FPC 0 Sensor 2	OK	39 degrees C / 102 degrees F
	FPC 0 Coretemp	OK	75 degrees C / 167 degrees F
Fans	FPC 0 Fan Tray 0	OK	Spinning at normal speed
	FPC 0 Fan Tray 1	OK	Spinning at normal speed

## show chassis environment (MX104 Router)

user@host&gt; show chassis environment

Class	Item	Status	Measurement
Temp	PEM 0	OK	34 degrees C / 93 degrees F
	PEM 1	Absent	
	ABB 0 Intake	OK	33 degrees C / 91 degrees F
	ABB 0 Exhaust A	OK	42 degrees C / 107 degrees F
	ABB 0 Exhaust B	OK	43 degrees C / 109 degrees F
	ABB 1 Intake	Absent	
	ABB 1 Exhaust A	Absent	
	ABB 1 Exhaust B	Absent	
	Routing Engine 0	OK	34 degrees C / 93 degrees F
	Routing Engine 0 CPU	OK	46 degrees C / 114 degrees F
	Routing Engine 1	Absent	
	Routing Engine 1 CPU	Absent	
	AFEB 0 AFEB Processor	OK	33 degrees C / 91 degrees F
	Fan 1	OK	Spinning at normal speed
Fans	Fan 2	OK	Spinning at normal speed
	Fan 3	OK	Spinning at normal speed
	Fan 4	OK	Spinning at normal speed
	Fan 5	OK	Spinning at normal speed

## show chassis environment (MX240 Router)

user@host&gt; show chassis environment

Class	Item	Status	Measurement
Temp	PEM 0	OK	40 degrees C / 104 degrees F
	PEM 1	OK	45 degrees C / 113 degrees F
	PEM 2	Absent	
	PEM 3	Absent	
	Routing Engine 0	OK	39 degrees C / 102 degrees F
	Routing Engine 1	OK	37 degrees C / 98 degrees F
	CB 0 Intake	OK	36 degrees C / 96 degrees F
	CB 0 Exhaust A	OK	34 degrees C / 93 degrees F
	CB 0 Exhaust B	OK	38 degrees C / 100 degrees F
	CB 0 ACBC	OK	37 degrees C / 98 degrees F
	CB 0 SF A	OK	49 degrees C / 120 degrees F
	CB 0 SF B	OK	41 degrees C / 105 degrees F
	CB 1 Intake	OK	37 degrees C / 98 degrees F
	CB 1 Exhaust A	OK	34 degrees C / 93 degrees F
	CB 1 Exhaust B	OK	39 degrees C / 102 degrees F
	CB 1 ACBC	OK	38 degrees C / 100 degrees F
	CB 1 SF A	OK	47 degrees C / 116 degrees F
	CB 1 SF B	OK	41 degrees C / 105 degrees F
	FPC 1 Intake	OK	33 degrees C / 91 degrees F
	FPC 1 Exhaust A	OK	38 degrees C / 100 degrees F
	FPC 1 Exhaust B	OK	53 degrees C / 127 degrees F
	FPC 1 I3 0 TSensor	OK	50 degrees C / 122 degrees F
	FPC 1 I3 0 Chip	OK	53 degrees C / 127 degrees F
	FPC 1 I3 1 TSensor	OK	49 degrees C / 120 degrees F
	FPC 1 I3 1 Chip	OK	52 degrees C / 125 degrees F
	FPC 1 I3 2 TSensor	OK	47 degrees C / 116 degrees F
	FPC 1 I3 2 Chip	OK	49 degrees C / 120 degrees F
	FPC 1 I3 3 TSensor	OK	44 degrees C / 111 degrees F
	FPC 1 I3 3 Chip	OK	46 degrees C / 114 degrees F
	FPC 1 IA 0 TSensor	OK	45 degrees C / 113 degrees F
	FPC 1 IA 0 Chip	OK	44 degrees C / 111 degrees F

	FPC 1 IA 1 TSensor	OK	44 degrees C / 111 degrees F
	FPC 1 IA 1 Chip	OK	48 degrees C / 118 degrees F
	FPC 2 Intake	OK	32 degrees C / 89 degrees F
	FPC 2 Exhaust A	OK	40 degrees C / 104 degrees F
	FPC 2 Exhaust B	OK	52 degrees C / 125 degrees F
	FPC 2 I3 0 TSensor	OK	52 degrees C / 125 degrees F
	FPC 2 I3 0 Chip	OK	56 degrees C / 132 degrees F
	FPC 2 I3 1 TSensor	OK	52 degrees C / 125 degrees F
	FPC 2 I3 1 Chip	OK	55 degrees C / 131 degrees F
	FPC 2 I3 2 TSensor	OK	49 degrees C / 120 degrees F
	FPC 2 I3 2 Chip	OK	52 degrees C / 125 degrees F
	FPC 2 I3 3 TSensor	OK	44 degrees C / 111 degrees F
	FPC 2 I3 3 Chip	OK	48 degrees C / 118 degrees F
	FPC 2 IA 0 TSensor	OK	50 degrees C / 122 degrees F
	FPC 2 IA 0 Chip	OK	48 degrees C / 118 degrees F
	FPC 2 IA 1 TSensor	OK	47 degrees C / 116 degrees F
	FPC 2 IA 1 Chip	OK	53 degrees C / 127 degrees F
Fans	Front Fan	OK	Spinning at normal speed
	Middle Fan	OK	Spinning at normal speed
	Rear Fan	OK	Spinning at normal speed

#### show chassis environment (MX240 Router with SCBE)

```
user@host> show chassis environment
```

Class	Item	Status	Measurement
Temp	PEM 0	OK	40 degrees C / 104 degrees F
	PEM 1	OK	45 degrees C / 113 degrees F
	PEM 2	Absent	
	PEM 3	Absent	
	Routing Engine 0	OK	39 degrees C / 102 degrees F
	Routing Engine 1	OK	37 degrees C / 98 degrees F
	CB 0 Intake	OK	36 degrees C / 96 degrees F
	CB 0 Exhaust A	OK	34 degrees C / 93 degrees F
	CB 0 Exhaust B	OK	38 degrees C / 100 degrees F
	CB 0 ACBC	OK	37 degrees C / 98 degrees F
	CB 0 XF A	OK	49 degrees C / 120 degrees F
	CB 0 XF B	OK	41 degrees C / 105 degrees F
	CB 1 Intake	OK	37 degrees C / 98 degrees F
	CB 1 Exhaust A	OK	34 degrees C / 93 degrees F
	CB 1 Exhaust B	OK	39 degrees C / 102 degrees F
	CB 1 ACBC	OK	38 degrees C / 100 degrees F
	CB 1 XF A	OK	47 degrees C / 116 degrees F
	CB 1 XF B	OK	41 degrees C / 105 degrees F
	FPC 1 Intake	OK	33 degrees C / 91 degrees F
	FPC 1 Exhaust A	OK	38 degrees C / 100 degrees F
	FPC 1 Exhaust B	OK	53 degrees C / 127 degrees F
	FPC 1 I3 0 TSensor	OK	50 degrees C / 122 degrees F
	FPC 1 I3 0 Chip	OK	53 degrees C / 127 degrees F
	FPC 1 I3 1 TSensor	OK	49 degrees C / 120 degrees F
	FPC 1 I3 1 Chip	OK	52 degrees C / 125 degrees F
	FPC 1 I3 2 TSensor	OK	47 degrees C / 116 degrees F
	FPC 1 I3 2 Chip	OK	49 degrees C / 120 degrees F
	FPC 1 I3 3 TSensor	OK	44 degrees C / 111 degrees F
	FPC 1 I3 3 Chip	OK	46 degrees C / 114 degrees F
	FPC 1 IA 0 TSensor	OK	45 degrees C / 113 degrees F
	FPC 1 IA 0 Chip	OK	44 degrees C / 111 degrees F
	FPC 1 IA 1 TSensor	OK	44 degrees C / 111 degrees F
	FPC 1 IA 1 Chip	OK	48 degrees C / 118 degrees F
	FPC 2 Intake	OK	32 degrees C / 89 degrees F

	FPC 2 Exhaust A	OK	40 degrees C / 104 degrees F
	FPC 2 Exhaust B	OK	52 degrees C / 125 degrees F
	FPC 2 I3 0 TSensor	OK	52 degrees C / 125 degrees F
	FPC 2 I3 0 Chip	OK	56 degrees C / 132 degrees F
	FPC 2 I3 1 TSensor	OK	52 degrees C / 125 degrees F
	FPC 2 I3 1 Chip	OK	55 degrees C / 131 degrees F
	FPC 2 I3 2 TSensor	OK	49 degrees C / 120 degrees F
	FPC 2 I3 2 Chip	OK	52 degrees C / 125 degrees F
	FPC 2 I3 3 TSensor	OK	44 degrees C / 111 degrees F
	FPC 2 I3 3 Chip	OK	48 degrees C / 118 degrees F
	FPC 2 IA 0 TSensor	OK	50 degrees C / 122 degrees F
	FPC 2 IA 0 Chip	OK	48 degrees C / 118 degrees F
	FPC 2 IA 1 TSensor	OK	47 degrees C / 116 degrees F
	FPC 2 IA 1 Chip	OK	53 degrees C / 127 degrees F
Fans	Front Fan	OK	Spinning at normal speed
	Middle Fan	OK	Spinning at normal speed
	Rear Fan	OK	Spinning at normal speed

### show chassis environment (MX480 Router)

user@host> show chassis environment

Class	Item	Status	Measurement
Temp	PEM 0	OK	35 degrees C / 95 degrees F
	PEM 1	OK	40 degrees C / 104 degrees F
	PEM 2	Absent	
	PEM 3	Absent	
	Routing Engine 0	OK	44 degrees C / 111 degrees F
	Routing Engine 1	OK	45 degrees C / 113 degrees F
	CB 0 Intake	OK	36 degrees C / 96 degrees F
	CB 0 Exhaust A	OK	38 degrees C / 100 degrees F
	CB 0 Exhaust B	OK	39 degrees C / 102 degrees F
	CB 0 ACBC	OK	37 degrees C / 98 degrees F
	CB 0 SF A	OK	51 degrees C / 123 degrees F
	CB 0 SF B	OK	44 degrees C / 111 degrees F
	CB 1 Intake	OK	36 degrees C / 96 degrees F
	CB 1 Exhaust A	OK	39 degrees C / 102 degrees F
	CB 1 Exhaust B	OK	40 degrees C / 104 degrees F
	CB 1 ACBC	OK	37 degrees C / 98 degrees F
	CB 1 SF A	OK	50 degrees C / 122 degrees F
	CB 1 SF B	OK	43 degrees C / 109 degrees F
	FPC 0 Intake	OK	36 degrees C / 96 degrees F
	FPC 0 Exhaust A	OK	39 degrees C / 102 degrees F
	FPC 0 Exhaust B	OK	51 degrees C / 123 degrees F
	FPC 0 I3 0 TSensor	OK	49 degrees C / 120 degrees F
	FPC 0 I3 0 Chip	OK	56 degrees C / 132 degrees F
	FPC 0 I3 1 TSensor	OK	47 degrees C / 116 degrees F
	FPC 0 I3 1 Chip	OK	52 degrees C / 125 degrees F
	FPC 0 I3 2 TSensor	OK	46 degrees C / 114 degrees F
	FPC 0 I3 2 Chip	OK	48 degrees C / 118 degrees F
	FPC 0 I3 3 TSensor	OK	42 degrees C / 107 degrees F
	FPC 0 I3 3 Chip	OK	45 degrees C / 113 degrees F
	FPC 0 IA 0 TSensor	OK	45 degrees C / 113 degrees F
	FPC 0 IA 0 Chip	OK	45 degrees C / 113 degrees F
	FPC 0 IA 1 TSensor	OK	44 degrees C / 111 degrees F
	FPC 0 IA 1 Chip	OK	48 degrees C / 118 degrees F
	FPC 1 Intake	OK	37 degrees C / 98 degrees F
	FPC 1 Exhaust A	OK	41 degrees C / 105 degrees F
	FPC 1 Exhaust B	OK	52 degrees C / 125 degrees F
	FPC 1 I3 0 TSensor	OK	51 degrees C / 123 degrees F

Fans	FPC 1 I3 0 Chip	OK	57 degrees C / 134 degrees F
	FPC 1 I3 1 TSensor	OK	48 degrees C / 118 degrees F
	FPC 1 I3 1 Chip	OK	52 degrees C / 125 degrees F
	FPC 1 I3 2 TSensor	OK	46 degrees C / 114 degrees F
	FPC 1 I3 2 Chip	OK	50 degrees C / 122 degrees F
	FPC 1 I3 3 TSensor	OK	42 degrees C / 107 degrees F
	FPC 1 I3 3 Chip	OK	46 degrees C / 114 degrees F
	FPC 1 IA 0 TSensor	OK	49 degrees C / 120 degrees F
	FPC 1 IA 0 Chip	OK	48 degrees C / 118 degrees F
	FPC 1 IA 1 TSensor	OK	46 degrees C / 114 degrees F
	FPC 1 IA 1 Chip	OK	50 degrees C / 122 degrees F
	Top Rear Fan	OK	Spinning at normal speed
	Bottom Rear Fan	OK	Spinning at normal speed
	Top Middle Fan	OK	Spinning at normal speed
	Bottom Middle Fan	OK	Spinning at normal speed
	Top Front Fan	OK	Spinning at normal speed
	Bottom Front Fan	OK	Spinning at normal speed

## show chassis environment (MX480 Router with SCBE)

user@host&gt; show chassis environment

Class	Item	Status	Measurement
Temp	PEM 0	OK	35 degrees C / 95 degrees F
	PEM 1	OK	40 degrees C / 104 degrees F
	PEM 2	Absent	
	PEM 3	Absent	
	Routing Engine 0	OK	44 degrees C / 111 degrees F
	Routing Engine 1	OK	45 degrees C / 113 degrees F
	CB 0 Intake	OK	36 degrees C / 96 degrees F
	CB 0 Exhaust A	OK	38 degrees C / 100 degrees F
	CB 0 Exhaust B	OK	39 degrees C / 102 degrees F
	CB 0 ACBC	OK	37 degrees C / 98 degrees F
	CB 0 XF A	OK	51 degrees C / 123 degrees F
	CB 0 XF B	OK	44 degrees C / 111 degrees F
	CB 1 Intake	OK	36 degrees C / 96 degrees F
	CB 1 Exhaust A	OK	39 degrees C / 102 degrees F
	CB 1 Exhaust B	OK	40 degrees C / 104 degrees F
	CB 1 ACBC	OK	37 degrees C / 98 degrees F
	CB 1 XF A	OK	50 degrees C / 122 degrees F
	CB 1 XF B	OK	43 degrees C / 109 degrees F
	FPC 0 Intake	OK	36 degrees C / 96 degrees F
	FPC 0 Exhaust A	OK	39 degrees C / 102 degrees F
	FPC 0 Exhaust B	OK	51 degrees C / 123 degrees F
	FPC 0 I3 0 TSensor	OK	49 degrees C / 120 degrees F
	FPC 0 I3 0 Chip	OK	56 degrees C / 132 degrees F
	FPC 0 I3 1 TSensor	OK	47 degrees C / 116 degrees F
	FPC 0 I3 1 Chip	OK	52 degrees C / 125 degrees F
	FPC 0 I3 2 TSensor	OK	46 degrees C / 114 degrees F
	FPC 0 I3 2 Chip	OK	48 degrees C / 118 degrees F
	FPC 0 I3 3 TSensor	OK	42 degrees C / 107 degrees F
	FPC 0 I3 3 Chip	OK	45 degrees C / 113 degrees F
	FPC 0 IA 0 TSensor	OK	45 degrees C / 113 degrees F
	FPC 0 IA 0 Chip	OK	45 degrees C / 113 degrees F
	FPC 0 IA 1 TSensor	OK	44 degrees C / 111 degrees F
	FPC 0 IA 1 Chip	OK	48 degrees C / 118 degrees F
	FPC 1 Intake	OK	37 degrees C / 98 degrees F
	FPC 1 Exhaust A	OK	41 degrees C / 105 degrees F
	FPC 1 Exhaust B	OK	52 degrees C / 125 degrees F
	FPC 1 I3 0 TSensor	OK	51 degrees C / 123 degrees F

	FPC 1 I3 0 Chip	OK	57 degrees C / 134 degrees F
	FPC 1 I3 1 TSensor	OK	48 degrees C / 118 degrees F
	FPC 1 I3 1 Chip	OK	52 degrees C / 125 degrees F
	FPC 1 I3 2 TSensor	OK	46 degrees C / 114 degrees F
	FPC 1 I3 2 Chip	OK	50 degrees C / 122 degrees F
	FPC 1 I3 3 TSensor	OK	42 degrees C / 107 degrees F
	FPC 1 I3 3 Chip	OK	46 degrees C / 114 degrees F
	FPC 1 IA 0 TSensor	OK	49 degrees C / 120 degrees F
	FPC 1 IA 0 Chip	OK	48 degrees C / 118 degrees F
	FPC 1 IA 1 TSensor	OK	46 degrees C / 114 degrees F
	FPC 1 IA 1 Chip	OK	50 degrees C / 122 degrees F
Fans	Top Rear Fan	OK	Spinning at normal speed
	Bottom Rear Fan	OK	Spinning at normal speed
	Top Middle Fan	OK	Spinning at normal speed
	Bottom Middle Fan	OK	Spinning at normal speed
	Top Front Fan	OK	Spinning at normal speed
	Bottom Front Fan	OK	Spinning at normal speed

### show chassis environment (MX960 Router)

user@host> show chassis environment

Class	Item	Status	Measurement
Temp	PEM 0	Absent	
	PEM 1	Absent	
	PEM 2	Check	
	PEM 3	OK	35 degrees C / 95 degrees F
	Routing Engine 0	OK	37 degrees C / 98 degrees F
	Routing Engine 1	Absent	
	CB 0 Intake	OK	24 degrees C / 75 degrees F
	CB 0 Exhaust A	OK	30 degrees C / 86 degrees F
	CB 0 Exhaust B	OK	27 degrees C / 80 degrees F
	CB 1 Intake	Absent	
	CB 1 Exhaust A	Absent	
	CB 1 Exhaust B	Absent	
	CB 1 ACBC	Absent	
	CB 1 SF A	Absent	
	CB 1 SF B	Absent	
	CB 2 Intake	Absent	
	CB 2 Exhaust A	Absent	
	CB 2 Exhaust B	Absent	
	CB 2 ACBC	Absent	
	CB 2 SF A	Absent	
	CB 2 SF B	Absent	
	FPC 4 Intake	OK	24 degrees C / 75 degrees F
	FPC 4 Exhaust A	OK	36 degrees C / 96 degrees F
	FPC 4 Exhaust B	OK	38 degrees C / 100 degrees F
	FPC 7 Intake	OK	24 degrees C / 75 degrees F
	FPC 7 Exhaust A	OK	36 degrees C / 96 degrees F
	FPC 7 Exhaust B	OK	42 degrees C / 107 degrees F
Fans	Top Fan Tray Temp	Failed	
	Top Tray Fan 1	OK	Spinning at normal speed
	Top Tray Fan 2	OK	Spinning at normal speed
	Top Tray Fan 3	OK	Spinning at normal speed
	Top Tray Fan 4	OK	Spinning at normal speed
	Top Tray Fan 5	OK	Spinning at normal speed
	Top Tray Fan 6	OK	Spinning at normal speed
	Bottom Fan Tray Temp	Failed	
	Bottom Tray Fan 1	OK	Spinning at normal speed
	Bottom Tray Fan 2	OK	Spinning at normal speed

Bottom Tray Fan 3	OK	Spinning at normal speed
Bottom Tray Fan 4	OK	Spinning at normal speed
Bottom Tray Fan 5	OK	Spinning at normal speed
Bottom Tray Fan 6	OK	Spinning at normal speed

### show chassis environment (MX960 Router with SCBE)

user@host> show chassis environment

Class	Item	Status	Measurement
Temp	PEM 0	Absent	
	PEM 1	OK	50 degrees C / 122 degrees F
	PEM 2	OK	50 degrees C / 122 degrees F
	PEM 3	OK	50 degrees C / 122 degrees F
	Routing Engine 0	OK	42 degrees C / 107 degrees F
	Routing Engine 0 CPU	OK	51 degrees C / 123 degrees F
	Routing Engine 1	OK	39 degrees C / 102 degrees F
	Routing Engine 1 CPU	OK	44 degrees C / 111 degrees F
	CB 0 Intake	OK	35 degrees C / 95 degrees F
	CB 0 Exhaust A	OK	36 degrees C / 96 degrees F
	CB 0 Exhaust B	OK	43 degrees C / 109 degrees F
	CB 0 ACBC	OK	38 degrees C / 100 degrees F
	CB 0 XF A	OK	53 degrees C / 127 degrees F
	CB 0 XF B	OK	47 degrees C / 116 degrees F
	CB 1 Intake	OK	35 degrees C / 95 degrees F
	CB 1 Exhaust A	OK	35 degrees C / 95 degrees F
	CB 1 Exhaust B	OK	41 degrees C / 105 degrees F
	CB 1 ACBC	OK	38 degrees C / 100 degrees F
	CB 1 XF A	OK	52 degrees C / 125 degrees F
	CB 1 XF B	OK	47 degrees C / 116 degrees F
	CB 2 Intake	OK	32 degrees C / 89 degrees F
	CB 2 Exhaust A	OK	30 degrees C / 86 degrees F
	CB 2 Exhaust B	OK	35 degrees C / 95 degrees F
	CB 2 ACBC	OK	33 degrees C / 91 degrees F
	CB 2 XF A	OK	51 degrees C / 123 degrees F
	CB 2 XF B	OK	50 degrees C / 122 degrees F
	FPC 0 Intake	OK	35 degrees C / 95 degrees F
	FPC 0 Exhaust A	OK	39 degrees C / 102 degrees F
	FPC 0 Exhaust B	OK	50 degrees C / 122 degrees F
	FPC 0 I3 0 TSensor	OK	50 degrees C / 122 degrees F
	FPC 0 I3 0 Chip	OK	56 degrees C / 132 degrees F
	FPC 0 I3 1 TSensor	OK	47 degrees C / 116 degrees F
	FPC 0 I3 1 Chip	OK	50 degrees C / 122 degrees F
	FPC 0 I3 2 TSensor	OK	45 degrees C / 113 degrees F
	FPC 0 I3 2 Chip	OK	48 degrees C / 118 degrees F
	FPC 0 I3 3 TSensor	OK	41 degrees C / 105 degrees F
	FPC 0 I3 3 Chip	OK	44 degrees C / 111 degrees F
	FPC 0 IA 0 TSensor	OK	45 degrees C / 113 degrees F
	FPC 0 IA 0 Chip	OK	45 degrees C / 113 degrees F
	FPC 0 IA 1 TSensor	OK	44 degrees C / 111 degrees F
	FPC 0 IA 1 Chip	OK	48 degrees C / 118 degrees F
	FPC 1 Intake	OK	36 degrees C / 96 degrees F
	FPC 1 Exhaust A	OK	47 degrees C / 116 degrees F
	FPC 1 Exhaust B	OK	43 degrees C / 109 degrees F
	FPC 1 LU 0 TCAM TSensor	OK	53 degrees C / 127 degrees F
	FPC 1 LU 0 TCAM Chip	OK	57 degrees C / 134 degrees F
	FPC 1 LU 0 TSensor	OK	53 degrees C / 127 degrees F
	FPC 1 LU 0 Chip	OK	60 degrees C / 140 degrees F
	FPC 1 MQ 0 TSensor	OK	53 degrees C / 127 degrees F
	FPC 1 MQ 0 Chip	OK	56 degrees C / 132 degrees F



FPC 1 LU 1 TCAM TSensor	OK	51 degrees C / 123 degrees F
FPC 1 LU 1 TCAM Chip	OK	52 degrees C / 125 degrees F
FPC 1 LU 1 TSensor	OK	51 degrees C / 123 degrees F
FPC 1 LU 1 Chip	OK	53 degrees C / 127 degrees F
FPC 1 MQ 1 TSensor	OK	51 degrees C / 123 degrees F
FPC 1 MQ 1 Chip	OK	58 degrees C / 136 degrees F
FPC 2 Intake	OK	35 degrees C / 95 degrees F
FPC 2 Exhaust A	OK	39 degrees C / 102 degrees F
FPC 2 Exhaust B	OK	54 degrees C / 129 degrees F
FPC 2 I3 0 TSensor	OK	52 degrees C / 125 degrees F
FPC 2 I3 0 Chip	OK	59 degrees C / 138 degrees F
FPC 2 I3 1 TSensor	OK	48 degrees C / 118 degrees F
FPC 2 I3 1 Chip	OK	52 degrees C / 125 degrees F
FPC 2 I3 2 TSensor	OK	47 degrees C / 116 degrees F
FPC 2 I3 2 Chip	OK	49 degrees C / 120 degrees F
FPC 2 I3 3 TSensor	OK	41 degrees C / 105 degrees F
FPC 2 I3 3 Chip	OK	44 degrees C / 111 degrees F
FPC 2 IA 0 TSensor	OK	47 degrees C / 116 degrees F
FPC 2 IA 0 Chip	OK	46 degrees C / 114 degrees F
FPC 2 IA 1 TSensor	OK	45 degrees C / 113 degrees F
FPC 2 IA 1 Chip	OK	49 degrees C / 120 degrees F
FPC 3 Intake	OK	34 degrees C / 93 degrees F
FPC 3 Exhaust A	OK	34 degrees C / 93 degrees F
FPC 3 Exhaust B	OK	47 degrees C / 116 degrees F
FPC 3 I3 0 TSensor	OK	48 degrees C / 118 degrees F
FPC 3 I3 0 Chip	OK	52 degrees C / 125 degrees F
FPC 3 I3 1 TSensor	OK	46 degrees C / 114 degrees F
FPC 3 I3 1 Chip	OK	48 degrees C / 118 degrees F
FPC 3 IA 0 TSensor	OK	41 degrees C / 105 degrees F
FPC 3 IA 0 Chip	OK	40 degrees C / 104 degrees F
FPC 5 Intake	OK	42 degrees C / 107 degrees F
FPC 5 Exhaust A	OK	42 degrees C / 107 degrees F
FPC 5 Exhaust B	OK	53 degrees C / 127 degrees F
FPC 5 LU 0 TSensor	OK	53 degrees C / 127 degrees F
FPC 5 LU 0 Chip	OK	54 degrees C / 129 degrees F
FPC 5 LU 1 TSensor	OK	53 degrees C / 127 degrees F
FPC 5 LU 1 Chip	OK	61 degrees C / 141 degrees F
FPC 5 LU 2 TSensor	OK	53 degrees C / 127 degrees F
FPC 5 LU 2 Chip	OK	51 degrees C / 123 degrees F
FPC 5 LU 3 TSensor	OK	53 degrees C / 127 degrees F
FPC 5 LU 3 Chip	OK	53 degrees C / 127 degrees F
FPC 5 MQ 0 TSensor	OK	47 degrees C / 116 degrees F
FPC 5 MQ 0 Chip	OK	52 degrees C / 125 degrees F
FPC 5 MQ 1 TSensor	OK	47 degrees C / 116 degrees F
FPC 5 MQ 1 Chip	OK	52 degrees C / 125 degrees F
FPC 5 MQ 2 TSensor	OK	47 degrees C / 116 degrees F
FPC 5 MQ 2 Chip	OK	46 degrees C / 114 degrees F
FPC 5 MQ 3 TSensor	OK	47 degrees C / 116 degrees F
FPC 5 MQ 3 Chip	OK	45 degrees C / 113 degrees F
FPC 7 Intake	OK	36 degrees C / 96 degrees F
FPC 7 Exhaust A	OK	35 degrees C / 95 degrees F
FPC 7 Exhaust B	OK	33 degrees C / 91 degrees F
FPC 7 QX 0 TSensor	OK	42 degrees C / 107 degrees F
FPC 7 QX 0 Chip	OK	47 degrees C / 116 degrees F
FPC 7 LU 0 TCAM TSensor	OK	42 degrees C / 107 degrees F
FPC 7 LU 0 TCAM Chip	OK	44 degrees C / 111 degrees F
FPC 7 LU 0 TSensor	OK	42 degrees C / 107 degrees F
FPC 7 LU 0 Chip	OK	46 degrees C / 114 degrees F
FPC 7 MQ 0 TSensor	OK	42 degrees C / 107 degrees F
FPC 7 MQ 0 Chip	OK	45 degrees C / 113 degrees F

	FPC 8 Intake	OK	33 degrees C / 91 degrees F
	FPC 8 Exhaust A	OK	33 degrees C / 91 degrees F
	FPC 8 Exhaust B	OK	36 degrees C / 96 degrees F
	FPC 8 I3 0 TSensor	OK	38 degrees C / 100 degrees F
	FPC 8 I3 0 Chip	OK	43 degrees C / 109 degrees F
	FPC 8 BDS 0 TSensor	OK	37 degrees C / 98 degrees F
	FPC 8 BDS 0 Chip	OK	36 degrees C / 96 degrees F
	FPC 8 IA 0 TSensor	OK	37 degrees C / 98 degrees F
	FPC 8 IA 0 Chip	OK	37 degrees C / 98 degrees F
	FPC 10 Intake	OK	38 degrees C / 100 degrees F
	FPC 10 Exhaust A	OK	36 degrees C / 96 degrees F
	FPC 10 Exhaust B	OK	41 degrees C / 105 degrees F
	FPC 10 I3 0 TSensor	OK	40 degrees C / 104 degrees F
	FPC 10 I3 0 Chip	OK	42 degrees C / 107 degrees F
	FPC 10 I3 1 TSensor	OK	40 degrees C / 104 degrees F
	FPC 10 I3 1 Chip	OK	44 degrees C / 111 degrees F
	FPC 10 I3 2 TSensor	OK	42 degrees C / 107 degrees F
	FPC 10 I3 2 Chip	OK	43 degrees C / 109 degrees F
	FPC 10 I3 3 TSensor	OK	39 degrees C / 102 degrees F
	FPC 10 I3 3 Chip	OK	44 degrees C / 111 degrees F
	FPC 10 IA 0 TSensor	OK	36 degrees C / 96 degrees F
	FPC 10 IA 0 Chip	OK	36 degrees C / 96 degrees F
	FPC 10 IA 1 TSensor	OK	43 degrees C / 109 degrees F
	FPC 10 IA 1 Chip	OK	42 degrees C / 107 degrees F
Fans	Top Fan Tray Temp	OK	37 degrees C / 98 degrees F
	Top Tray Fan 1	OK	Spinning at normal speed
	Top Tray Fan 2	OK	Spinning at normal speed
	Top Tray Fan 3	OK	Spinning at normal speed
	Top Tray Fan 4	OK	Spinning at normal speed
	Top Tray Fan 5	OK	Spinning at normal speed
	Top Tray Fan 6	OK	Spinning at normal speed
	Bottom Fan Tray Temp	OK	28 degrees C / 82 degrees F
	Bottom Tray Fan 1	OK	Spinning at normal speed
	Bottom Tray Fan 2	OK	Spinning at normal speed
	Bottom Tray Fan 3	OK	Spinning at normal speed
	Bottom Tray Fan 4	OK	Spinning at normal speed
	Bottom Tray Fan 5	OK	Spinning at normal speed
	Bottom Tray Fan 6	OK	Spinning at normal speed

### show chassis environment (MX960 Router with MPC5EQ)

```
user@host> show chassis environment
```

Class	Item	Status	Measurement
Temp	PEM 0	OK	50 degrees C / 122 degrees F
	PEM 1	OK	45 degrees C / 113 degrees F
	PEM 2	OK	45 degrees C / 113 degrees F
	PEM 3	Absent	
	Routing Engine 0	OK	31 degrees C / 87 degrees F
	Routing Engine 0 CPU	OK	30 degrees C / 86 degrees F
	Routing Engine 1	Present	
	Routing Engine 1 CPU	Present	
	CB 0 Intake	OK	29 degrees C / 84 degrees F
	CB 0 Exhaust A	OK	29 degrees C / 84 degrees F
	CB 0 Exhaust B	OK	34 degrees C / 93 degrees F
	CB 0 ACBC	OK	32 degrees C / 89 degrees F
	CB 0 XF A	OK	49 degrees C / 120 degrees F
	CB 0 XF B	OK	45 degrees C / 113 degrees F
	CB 1 Intake	OK	26 degrees C / 78 degrees F
	CB 1 Exhaust A	OK	26 degrees C / 78 degrees F

CB 1 Exhaust B	OK	27 degrees C / 80 degrees F
CB 1 ACBC	OK	26 degrees C / 78 degrees F
CB 1 XF A	OK	32 degrees C / 89 degrees F
CB 1 XF B	OK	32 degrees C / 89 degrees F
CB 2 Intake	OK	28 degrees C / 82 degrees F
CB 2 Exhaust A	OK	27 degrees C / 80 degrees F
CB 2 Exhaust B	OK	33 degrees C / 91 degrees F
CB 2 ACBC	OK	30 degrees C / 86 degrees F
CB 2 XF A	OK	48 degrees C / 118 degrees F
CB 2 XF B	OK	46 degrees C / 114 degrees F
FPC 0 Intake	OK	38 degrees C / 100 degrees F
FPC 0 Exhaust A	OK	48 degrees C / 118 degrees F
FPC 0 Exhaust B	OK	49 degrees C / 120 degrees F
FPC 0 XL TSen	OK	48 degrees C / 118 degrees F
FPC 0 XL Chip	OK	50 degrees C / 122 degrees F
FPC 0 XL_XR0 TSen	OK	48 degrees C / 118 degrees F
FPC 0 XL_XR0 Chip	OK	53 degrees C / 127 degrees F
FPC 0 XL_XR1 TSen	OK	48 degrees C / 118 degrees F
FPC 0 XL_XR1 Chip	OK	54 degrees C / 129 degrees F
FPC 0 XQ TSen	OK	48 degrees C / 118 degrees F
FPC 0 XQ Chip	OK	52 degrees C / 125 degrees F
FPC 0 XQ_XR0 TSen	OK	48 degrees C / 118 degrees F
FPC 0 XQ_XR0 Chip	OK	62 degrees C / 143 degrees F
FPC 0 XQ_XR1 TSen	OK	48 degrees C / 118 degrees F
FPC 0 XQ_XR1 Chip	OK	62 degrees C / 143 degrees F
FPC 0 XM 0 TSen	OK	53 degrees C / 127 degrees F
FPC 0 XM 0 Chip	OK	63 degrees C / 145 degrees F
FPC 0 XM 1 TSen	OK	53 degrees C / 127 degrees F
FPC 0 XM 1 Chip	OK	46 degrees C / 114 degrees F
FPC 0 PLX PCIe Switch TSe	OK	53 degrees C / 127 degrees F
FPC 0 PLX PCIe Switch Chi	OK	66 degrees C / 150 degrees F
FPC 1 Intake	OK	31 degrees C / 87 degrees F
FPC 1 Exhaust A	OK	38 degrees C / 100 degrees F
FPC 1 Exhaust B	OK	49 degrees C / 120 degrees F
FPC 1 LU 0 TSen	OK	41 degrees C / 105 degrees F
FPC 1 LU 0 Chip	OK	47 degrees C / 116 degrees F
FPC 1 LU 1 TSen	OK	41 degrees C / 105 degrees F
FPC 1 LU 1 Chip	OK	42 degrees C / 107 degrees F
FPC 1 LU 2 TSen	OK	41 degrees C / 105 degrees F
FPC 1 LU 2 Chip	OK	46 degrees C / 114 degrees F
FPC 1 LU 3 TSen	OK	41 degrees C / 105 degrees F
FPC 1 LU 3 Chip	OK	51 degrees C / 123 degrees F
FPC 1 XM 0 TSen	OK	41 degrees C / 105 degrees F
FPC 1 XM 0 Chip	OK	49 degrees C / 120 degrees F
FPC 1 XF 0 TSen	OK	41 degrees C / 105 degrees F
FPC 1 XF 0 Chip	OK	63 degrees C / 145 degrees F
FPC 1 PLX Switch TSen	OK	41 degrees C / 105 degrees F
FPC 1 PLX Switch Chip	OK	43 degrees C / 109 degrees F
FPC 3 Intake	OK	31 degrees C / 87 degrees F
FPC 3 Exhaust A	OK	37 degrees C / 98 degrees F
FPC 3 Exhaust B	OK	43 degrees C / 109 degrees F
FPC 3 LU 0 TSen	OK	42 degrees C / 107 degrees F
FPC 3 LU 0 Chip	OK	43 degrees C / 109 degrees F
FPC 3 LU 1 TSen	OK	42 degrees C / 107 degrees F
FPC 3 LU 1 Chip	OK	46 degrees C / 114 degrees F
FPC 3 LU 2 TSen	OK	42 degrees C / 107 degrees F
FPC 3 LU 2 Chip	OK	40 degrees C / 104 degrees F
FPC 3 LU 3 TSen	OK	42 degrees C / 107 degrees F
FPC 3 LU 3 Chip	OK	41 degrees C / 105 degrees F
FPC 3 MQ 0 TSen	OK	37 degrees C / 98 degrees F

FPC 3 MQ 0 Chip	OK	37 degrees C / 98 degrees F
FPC 3 MQ 1 TSen	OK	37 degrees C / 98 degrees F
FPC 3 MQ 1 Chip	OK	40 degrees C / 104 degrees F
FPC 3 MQ 2 TSen	OK	37 degrees C / 98 degrees F
FPC 3 MQ 2 Chip	OK	36 degrees C / 96 degrees F
FPC 3 MQ 3 TSen	OK	37 degrees C / 98 degrees F
FPC 3 MQ 3 Chip	OK	38 degrees C / 100 degrees F
FPC 4 Intake	OK	34 degrees C / 93 degrees F
FPC 4 Exhaust A	OK	45 degrees C / 113 degrees F
FPC 4 Exhaust B	OK	47 degrees C / 116 degrees F
FPC 4 XL TSen	OK	44 degrees C / 111 degrees F
FPC 4 XL Chip	OK	47 degrees C / 116 degrees F
FPC 4 XL_XR0 TSen	OK	44 degrees C / 111 degrees F
FPC 4 XL_XR0 Chip	OK	48 degrees C / 118 degrees F
FPC 4 XL_XR1 TSen	OK	44 degrees C / 111 degrees F
FPC 4 XL_XR1 Chip	OK	47 degrees C / 116 degrees F
FPC 4 XQ TSen	OK	44 degrees C / 111 degrees F
FPC 4 XQ Chip	OK	47 degrees C / 116 degrees F
FPC 4 XQ_XR0 TSen	OK	44 degrees C / 111 degrees F
FPC 4 XQ_XR0 Chip	OK	57 degrees C / 134 degrees F
FPC 4 XQ_XR1 TSen	OK	44 degrees C / 111 degrees F
FPC 4 XQ_XR1 Chip	OK	58 degrees C / 136 degrees F
FPC 4 XM 0 TSen	OK	51 degrees C / 123 degrees F
FPC 4 XM 0 Chip	OK	61 degrees C / 141 degrees F
FPC 4 XM 1 TSen	OK	51 degrees C / 123 degrees F
FPC 4 XM 1 Chip	OK	47 degrees C / 116 degrees F
FPC 4 PLX PCIe Switch TSe	OK	51 degrees C / 123 degrees F
FPC 4 PLX PCIe Switch Chi	OK	60 degrees C / 140 degrees F
FPC 5 Intake	OK	34 degrees C / 93 degrees F
FPC 5 Exhaust A	OK	45 degrees C / 113 degrees F
FPC 5 Exhaust B	OK	47 degrees C / 116 degrees F
FPC 5 XL TSen	OK	45 degrees C / 113 degrees F
FPC 5 XL Chip	OK	47 degrees C / 116 degrees F
FPC 5 XL_XR0 TSen	OK	45 degrees C / 113 degrees F
FPC 5 XL_XR0 Chip	OK	49 degrees C / 120 degrees F
FPC 5 XL_XR1 TSen	OK	45 degrees C / 113 degrees F
FPC 5 XL_XR1 Chip	OK	49 degrees C / 120 degrees F
FPC 5 XQ TSen	OK	45 degrees C / 113 degrees F
FPC 5 XQ Chip	OK	48 degrees C / 118 degrees F
FPC 5 XQ_XR0 TSen	OK	45 degrees C / 113 degrees F
FPC 5 XQ_XR0 Chip	OK	60 degrees C / 140 degrees F
FPC 5 XQ_XR1 TSen	OK	45 degrees C / 113 degrees F
FPC 5 XQ_XR1 Chip	OK	58 degrees C / 136 degrees F
FPC 5 XM 0 TSen	OK	50 degrees C / 122 degrees F
FPC 5 XM 0 Chip	OK	48 degrees C / 118 degrees F
FPC 5 XM 1 TSen	OK	50 degrees C / 122 degrees F
FPC 5 XM 1 Chip	OK	47 degrees C / 116 degrees F
FPC 5 PLX PCIe Switch TSe	OK	50 degrees C / 122 degrees F
FPC 5 PLX PCIe Switch Chi	OK	59 degrees C / 138 degrees F
FPC 7 Intake	OK	32 degrees C / 89 degrees F
FPC 7 Exhaust A	OK	32 degrees C / 89 degrees F
FPC 7 Exhaust B	OK	33 degrees C / 91 degrees F
FPC 7 LU 0 TSen	OK	49 degrees C / 120 degrees F
FPC 7 LU 0 Chip	OK	44 degrees C / 111 degrees F
FPC 7 LU 1 TSen	OK	49 degrees C / 120 degrees F
FPC 7 LU 1 Chip	OK	47 degrees C / 116 degrees F
FPC 7 LU 2 TSen	OK	49 degrees C / 120 degrees F
FPC 7 LU 2 Chip	OK	39 degrees C / 102 degrees F
FPC 7 LU 3 TSen	OK	49 degrees C / 120 degrees F
FPC 7 LU 3 Chip	OK	43 degrees C / 109 degrees F

FPC 7 XM 0 TSen	OK	49 degrees C / 120 degrees F
FPC 7 XM 0 Chip	OK	57 degrees C / 134 degrees F
FPC 7 XM 1 TSen	OK	49 degrees C / 120 degrees F
FPC 7 XM 1 Chip	OK	48 degrees C / 118 degrees F
FPC 7 PLX Switch TSen	OK	49 degrees C / 120 degrees F
FPC 7 PLX Switch Chip	OK	45 degrees C / 113 degrees F
FPC 8 Intake	OK	36 degrees C / 96 degrees F
FPC 8 Exhaust A	OK	51 degrees C / 123 degrees F
FPC 8 Exhaust B	OK	46 degrees C / 114 degrees F
FPC 8 XL TSen	OK	46 degrees C / 114 degrees F
FPC 8 XL Chip	OK	47 degrees C / 116 degrees F
FPC 8 XL_XR0 TSen	OK	46 degrees C / 114 degrees F
FPC 8 XL_XR0 Chip	OK	53 degrees C / 127 degrees F
FPC 8 XL_XR1 TSen	OK	46 degrees C / 114 degrees F
FPC 8 XL_XR1 Chip	OK	52 degrees C / 125 degrees F
FPC 8 XQ TSen	OK	46 degrees C / 114 degrees F
FPC 8 XQ Chip	OK	46 degrees C / 114 degrees F
FPC 8 XQ_XR0 TSen	OK	46 degrees C / 114 degrees F
FPC 8 XQ_XR0 Chip	OK	59 degrees C / 138 degrees F
FPC 8 XQ_XR1 TSen	OK	46 degrees C / 114 degrees F
FPC 8 XQ_XR1 Chip	OK	57 degrees C / 134 degrees F
FPC 8 XM 0 TSen	OK	52 degrees C / 125 degrees F
FPC 8 XM 0 Chip	OK	61 degrees C / 141 degrees F
FPC 8 XM 1 TSen	OK	52 degrees C / 125 degrees F
FPC 8 XM 1 Chip	OK	47 degrees C / 116 degrees F
FPC 8 PLX PCIe Switch TSe	OK	52 degrees C / 125 degrees F
FPC 8 PLX PCIe Switch Chi	OK	63 degrees C / 145 degrees F
FPC 9 Intake	OK	31 degrees C / 87 degrees F
FPC 9 Exhaust A	OK	34 degrees C / 93 degrees F
FPC 9 Exhaust B	OK	35 degrees C / 95 degrees F
FPC 9 QX 0 TSen	OK	42 degrees C / 107 degrees F
FPC 9 QX 0 Chip	OK	45 degrees C / 113 degrees F
FPC 9 LU 0 TCAM TSen	OK	42 degrees C / 107 degrees F
FPC 9 LU 0 TCAM Chip	OK	41 degrees C / 105 degrees F
FPC 9 LU 0 TSen	OK	42 degrees C / 107 degrees F
FPC 9 LU 0 Chip	OK	43 degrees C / 109 degrees F
FPC 9 MQ 0 TSen	OK	42 degrees C / 107 degrees F
FPC 9 MQ 0 Chip	OK	43 degrees C / 109 degrees F
FPC 9 QX 1 TSen	OK	38 degrees C / 100 degrees F
FPC 9 QX 1 Chip	OK	40 degrees C / 104 degrees F
FPC 9 LU 1 TCAM TSen	OK	38 degrees C / 100 degrees F
FPC 9 LU 1 TCAM Chip	OK	38 degrees C / 100 degrees F
FPC 9 LU 1 TSen	OK	38 degrees C / 100 degrees F
FPC 9 LU 1 Chip	OK	41 degrees C / 105 degrees F
FPC 9 MQ 1 TSen	OK	38 degrees C / 100 degrees F
FPC 9 MQ 1 Chip	OK	41 degrees C / 105 degrees F
FPC 10 Intake	OK	35 degrees C / 95 degrees F
FPC 10 Exhaust A	OK	51 degrees C / 123 degrees F
FPC 10 Exhaust B	OK	46 degrees C / 114 degrees F
FPC 10 XL TSen	OK	42 degrees C / 107 degrees F
FPC 10 XL Chip	OK	44 degrees C / 111 degrees F
FPC 10 XL_XR0 TSen	OK	42 degrees C / 107 degrees F
FPC 10 XL_XR0 Chip	OK	47 degrees C / 116 degrees F
FPC 10 XL_XR1 TSen	OK	42 degrees C / 107 degrees F
FPC 10 XL_XR1 Chip	OK	48 degrees C / 118 degrees F
FPC 10 XQ TSen	OK	42 degrees C / 107 degrees F
FPC 10 XQ Chip	OK	46 degrees C / 114 degrees F
FPC 10 XQ_XR0 TSen	OK	42 degrees C / 107 degrees F
FPC 10 XQ_XR0 Chip	OK	57 degrees C / 134 degrees F
FPC 10 XQ_XR1 TSen	OK	42 degrees C / 107 degrees F

	FPC 10 XQ_XR1 Chip	OK	53 degrees C / 127 degrees F
	FPC 10 XM 0 TSen	OK	51 degrees C / 123 degrees F
	FPC 10 XM 0 Chip	OK	61 degrees C / 141 degrees F
	FPC 10 XM 1 TSen	OK	51 degrees C / 123 degrees F
	FPC 10 XM 1 Chip	OK	49 degrees C / 120 degrees F
	FPC 10 PLX PCIe Switch TSe	OK	51 degrees C / 123 degrees F
	FPC 10 PLX PCIe Switch Chi	OK	61 degrees C / 141 degrees F
	FPC 11 Intake	OK	33 degrees C / 91 degrees F
	FPC 11 Exhaust A	OK	33 degrees C / 91 degrees F
	FPC 11 Exhaust B	OK	34 degrees C / 93 degrees F
	FPC 11 LU 0 TSen	OK	50 degrees C / 122 degrees F
	FPC 11 LU 0 Chip	OK	48 degrees C / 118 degrees F
	FPC 11 LU 1 TSen	OK	50 degrees C / 122 degrees F
	FPC 11 LU 1 Chip	OK	50 degrees C / 122 degrees F
	FPC 11 LU 2 TSen	OK	50 degrees C / 122 degrees F
	FPC 11 LU 2 Chip	OK	41 degrees C / 105 degrees F
	FPC 11 LU 3 TSen	OK	50 degrees C / 122 degrees F
	FPC 11 LU 3 Chip	OK	48 degrees C / 118 degrees F
	FPC 11 XM 0 TSen	OK	50 degrees C / 122 degrees F
	FPC 11 XM 0 Chip	OK	57 degrees C / 134 degrees F
	FPC 11 XM 1 TSen	OK	50 degrees C / 122 degrees F
	FPC 11 XM 1 Chip	OK	52 degrees C / 125 degrees F
	FPC 11 PLX Switch TSen	OK	50 degrees C / 122 degrees F
	FPC 11 PLX Switch Chip	OK	45 degrees C / 113 degrees F
Fans	Top Fan Tray Temp	OK	42 degrees C / 107 degrees F
	Top Tray Fan 1	OK	Spinning at high speed
Top Tray Fan 2		OK	Spinning at high speed
	Top Tray Fan 3	OK	Spinning at high speed
	Top Tray Fan 4	OK	Spinning at high speed
	Top Tray Fan 5	OK	Spinning at high speed
	Top Tray Fan 6	OK	Spinning at high speed
	Top Tray Fan 7	OK	Spinning at high speed
	Top Tray Fan 8	OK	Spinning at high speed
	Top Tray Fan 9	OK	Spinning at high speed
	Top Tray Fan 10	OK	Spinning at high speed
	Top Tray Fan 11	OK	Spinning at high speed
	Top Tray Fan 12	OK	Spinning at high speed
	Bottom Fan Tray Temp	OK	33 degrees C / 91 degrees F
	Bottom Tray Fan 1	OK	Spinning at high speed
	Bottom Tray Fan 2	OK	Spinning at high speed
	Bottom Tray Fan 3	OK	Spinning at high speed
	Bottom Tray Fan 4	OK	Spinning at high speed
	Bottom Tray Fan 5	OK	Spinning at high speed
	Bottom Tray Fan 6	OK	Spinning at high speed
	Bottom Tray Fan 7	OK	Spinning at high speed
	Bottom Tray Fan 8	OK	Spinning at high speed
	Bottom Tray Fan 9	OK	Spinning at high speed
	Bottom Tray Fan 10	OK	Spinning at high speed
	Bottom Tray Fan 11	OK	Spinning at high speed
	Bottom Tray Fan 12	OK	Spinning at high speed

## show chassis environment (MX2020 Router)

user@host&gt; show chassis environment

Class	Item	Status	Measurement
Temp	PSM 0	Absent	
	PSM 1	Absent	
	PSM 2	OK	41 degrees C / 105 degrees F
	PSM 3	OK	39 degrees C / 102 degrees F

PSM 4	OK	39 degrees C / 102 degrees F
PSM 5	OK	38 degrees C / 100 degrees F
PSM 6	OK	38 degrees C / 100 degrees F
PSM 7	OK	38 degrees C / 100 degrees F
PSM 8	OK	37 degrees C / 98 degrees F
PSM 9	Absent	
PSM 10	Absent	
PSM 11	OK	47 degrees C / 116 degrees F
PSM 12	OK	45 degrees C / 113 degrees F
PSM 13	OK	44 degrees C / 111 degrees F
PSM 14	OK	44 degrees C / 111 degrees F
PSM 15	OK	43 degrees C / 109 degrees F
PSM 16	OK	42 degrees C / 107 degrees F
PSM 17	OK	41 degrees C / 105 degrees F
PDM 0	OK	
PDM 1	Absent	
PDM 2	Absent	
PDM 3	OK	
CB 0 IntakeA-Zone0	OK	45 degrees C / 113 degrees F
CB 0 IntakeB-Zone1	OK	34 degrees C / 93 degrees F
CB 0 IntakeC-Zone0	OK	48 degrees C / 118 degrees F
CB 0 ExhaustA-Zone0	OK	45 degrees C / 113 degrees F
CB 0 ExhaustB-Zone1	OK	37 degrees C / 98 degrees F
CB 0 TCBC-Zone0	OK	41 degrees C / 105 degrees F
CB 1 IntakeA-Zone0	OK	46 degrees C / 114 degrees F
CB 1 IntakeB-Zone1	OK	42 degrees C / 107 degrees F
CB 1 IntakeC-Zone0	OK	49 degrees C / 120 degrees F
CB 1 ExhaustA-Zone0	OK	46 degrees C / 114 degrees F
CB 1 ExhaustB-Zone1	OK	41 degrees C / 105 degrees F
CB 1 TCBC-Zone0	OK	46 degrees C / 114 degrees F
SPMB 0 Intake	OK	33 degrees C / 91 degrees F
SPMB 1 Intake	OK	42 degrees C / 107 degrees F
Routing Engine 0	OK	35 degrees C / 95 degrees F
Routing Engine 0 CPU	OK	34 degrees C / 93 degrees F
Routing Engine 1	OK	44 degrees C / 111 degrees F
Routing Engine 1 CPU	OK	42 degrees C / 107 degrees F
SFB 0 Intake-Zone0	OK	55 degrees C / 131 degrees F
SFB 0 Exhaust-Zone1	OK	48 degrees C / 118 degrees F
SFB 0 IntakeA-Zone0	OK	50 degrees C / 122 degrees F
SFB 0 IntakeB-Zone1	OK	40 degrees C / 104 degrees F
SFB 0 Exhaust-Zone0	OK	52 degrees C / 125 degrees F
SFB 0 SFB-XF2-Zone1	OK	61 degrees C / 141 degrees F
SFB 0 SFB-XF1-Zone0	OK	69 degrees C / 156 degrees F
SFB 0 SFB-XF0-Zone0	OK	68 degrees C / 154 degrees F
SFB 1 Intake-Zone0	OK	56 degrees C / 132 degrees F
SFB 1 Exhaust-Zone1	OK	47 degrees C / 116 degrees F
SFB 1 IntakeA-Zone0	OK	51 degrees C / 123 degrees F
SFB 1 IntakeB-Zone1	OK	40 degrees C / 104 degrees F
SFB 1 Exhaust-Zone0	OK	51 degrees C / 123 degrees F
SFB 1 SFB-XF2-Zone1	OK	62 degrees C / 143 degrees F
SFB 1 SFB-XF1-Zone0	OK	67 degrees C / 152 degrees F
SFB 1 SFB-XF0-Zone0	OK	69 degrees C / 156 degrees F
SFB 2 Intake-Zone0	OK	56 degrees C / 132 degrees F
SFB 2 Exhaust-Zone1	OK	47 degrees C / 116 degrees F
SFB 2 IntakeA-Zone0	OK	51 degrees C / 123 degrees F
SFB 2 IntakeB-Zone1	OK	40 degrees C / 104 degrees F
SFB 2 Exhaust-Zone0	OK	53 degrees C / 127 degrees F
SFB 2 SFB-XF2-Zone1	OK	65 degrees C / 149 degrees F
SFB 2 SFB-XF1-Zone0	OK	69 degrees C / 156 degrees F
SFB 2 SFB-XF0-Zone0	OK	70 degrees C / 158 degrees F

SFB 3 Intake-Zone0	OK	57 degrees C / 134 degrees F
SFB 3 Exhaust-Zone1	OK	48 degrees C / 118 degrees F
SFB 3 IntakeA-Zone0	OK	52 degrees C / 125 degrees F
SFB 3 IntakeB-Zone1	OK	41 degrees C / 105 degrees F
SFB 3 Exhaust-Zone0	OK	53 degrees C / 127 degrees F
SFB 3 SFB-XF2-Zone1	OK	66 degrees C / 150 degrees F
SFB 3 SFB-XF1-Zone0	OK	69 degrees C / 156 degrees F
SFB 3 SFB-XF0-Zone0	OK	71 degrees C / 159 degrees F
SFB 4 Intake-Zone0	OK	58 degrees C / 136 degrees F
SFB 4 Exhaust-Zone1	OK	49 degrees C / 120 degrees F
SFB 4 IntakeA-Zone0	OK	54 degrees C / 129 degrees F
SFB 4 IntakeB-Zone1	OK	42 degrees C / 107 degrees F
SFB 4 Exhaust-Zone0	OK	53 degrees C / 127 degrees F
SFB 4 SFB-XF2-Zone1	OK	64 degrees C / 147 degrees F
SFB 4 SFB-XF1-Zone0	OK	68 degrees C / 154 degrees F
SFB 4 SFB-XF0-Zone0	OK	71 degrees C / 159 degrees F
SFB 5 Intake-Zone0	OK	58 degrees C / 136 degrees F
SFB 5 Exhaust-Zone1	OK	50 degrees C / 122 degrees F
SFB 5 IntakeA-Zone0	OK	53 degrees C / 127 degrees F
SFB 5 IntakeB-Zone1	OK	43 degrees C / 109 degrees F
SFB 5 Exhaust-Zone0	OK	54 degrees C / 129 degrees F
SFB 5 SFB-XF2-Zone1	OK	66 degrees C / 150 degrees F
SFB 5 SFB-XF1-Zone0	OK	69 degrees C / 156 degrees F
SFB 5 SFB-XF0-Zone0	OK	74 degrees C / 165 degrees F
SFB 6 Intake-Zone0	OK	58 degrees C / 136 degrees F
SFB 6 Exhaust-Zone1	OK	49 degrees C / 120 degrees F
SFB 6 IntakeA-Zone0	OK	53 degrees C / 127 degrees F
SFB 6 IntakeB-Zone1	OK	43 degrees C / 109 degrees F
SFB 6 Exhaust-Zone0	OK	53 degrees C / 127 degrees F
SFB 6 SFB-XF2-Zone1	OK	65 degrees C / 149 degrees F
SFB 6 SFB-XF1-Zone0	OK	68 degrees C / 154 degrees F
SFB 6 SFB-XF0-Zone0	OK	72 degrees C / 161 degrees F
SFB 7 Intake-Zone0	OK	57 degrees C / 134 degrees F
SFB 7 Exhaust-Zone1	OK	50 degrees C / 122 degrees F
SFB 7 IntakeA-Zone0	OK	53 degrees C / 127 degrees F
SFB 7 IntakeB-Zone1	OK	43 degrees C / 109 degrees F
SFB 7 Exhaust-Zone0	OK	54 degrees C / 129 degrees F
SFB 7 SFB-XF2-Zone1	OK	68 degrees C / 154 degrees F
SFB 7 SFB-XF1-Zone0	OK	69 degrees C / 156 degrees F
SFB 7 SFB-XF0-Zone0	OK	73 degrees C / 163 degrees F
FPC 0 Intake	OK	41 degrees C / 105 degrees F
FPC 0 Exhaust A	OK	48 degrees C / 118 degrees F
FPC 0 Exhaust B	OK	62 degrees C / 143 degrees F
FPC 0 LU 0 TSen	OK	59 degrees C / 138 degrees F
FPC 0 LU 0 Chip	OK	62 degrees C / 143 degrees F
FPC 0 LU 1 TSen	OK	59 degrees C / 138 degrees F
FPC 0 LU 1 Chip	OK	64 degrees C / 147 degrees F
FPC 0 LU 2 TSen	OK	59 degrees C / 138 degrees F
FPC 0 LU 2 Chip	OK	53 degrees C / 127 degrees F
FPC 0 LU 3 TSen	OK	59 degrees C / 138 degrees F
FPC 0 LU 3 Chip	OK	53 degrees C / 127 degrees F
FPC 0 MQ 0 TSen	OK	47 degrees C / 116 degrees F
FPC 0 MQ 0 Chip	OK	49 degrees C / 120 degrees F
FPC 0 MQ 1 TSen	OK	47 degrees C / 116 degrees F
FPC 0 MQ 1 Chip	OK	51 degrees C / 123 degrees F
FPC 0 MQ 2 TSen	OK	47 degrees C / 116 degrees F
FPC 0 MQ 2 Chip	OK	44 degrees C / 111 degrees F
FPC 0 MQ 3 TSen	OK	47 degrees C / 116 degrees F
FPC 0 MQ 3 Chip	OK	45 degrees C / 113 degrees F
FPC 1 Intake	OK	40 degrees C / 104 degrees F



FPC 1 Exhaust A	OK	49 degrees C / 120 degrees F
FPC 1 Exhaust B	OK	58 degrees C / 136 degrees F
FPC 1 LU 0 TSen	OK	55 degrees C / 131 degrees F
FPC 1 LU 0 Chip	OK	56 degrees C / 132 degrees F
FPC 1 LU 1 TSen	OK	55 degrees C / 131 degrees F
FPC 1 LU 1 Chip	OK	58 degrees C / 136 degrees F
FPC 1 LU 2 TSen	OK	55 degrees C / 131 degrees F
FPC 1 LU 2 Chip	OK	49 degrees C / 120 degrees F
FPC 1 LU 3 TSen	OK	55 degrees C / 131 degrees F
FPC 1 LU 3 Chip	OK	51 degrees C / 123 degrees F
FPC 1 MQ 0 TSen	OK	47 degrees C / 116 degrees F
FPC 1 MQ 0 Chip	OK	48 degrees C / 118 degrees F
FPC 1 MQ 1 TSen	OK	47 degrees C / 116 degrees F
FPC 1 MQ 1 Chip	OK	50 degrees C / 122 degrees F
FPC 1 MQ 2 TSen	OK	47 degrees C / 116 degrees F
FPC 1 MQ 2 Chip	OK	44 degrees C / 111 degrees F
FPC 1 MQ 3 TSen	OK	47 degrees C / 116 degrees F
FPC 1 MQ 3 Chip	OK	44 degrees C / 111 degrees F
FPC 2 Intake	OK	39 degrees C / 102 degrees F
FPC 2 Exhaust A	OK	49 degrees C / 120 degrees F
FPC 2 Exhaust B	OK	61 degrees C / 141 degrees F
FPC 2 LU 0 TSen	OK	58 degrees C / 136 degrees F
FPC 2 LU 0 Chip	OK	60 degrees C / 140 degrees F
FPC 2 LU 1 TSen	OK	58 degrees C / 136 degrees F
FPC 2 LU 1 Chip	OK	65 degrees C / 149 degrees F
FPC 2 LU 2 TSen	OK	58 degrees C / 136 degrees F
FPC 2 LU 2 Chip	OK	51 degrees C / 123 degrees F
FPC 2 LU 3 TSen	OK	58 degrees C / 136 degrees F
FPC 2 LU 3 Chip	OK	53 degrees C / 127 degrees F
FPC 2 MQ 0 TSen	OK	47 degrees C / 116 degrees F
FPC 2 MQ 0 Chip	OK	50 degrees C / 122 degrees F
FPC 2 MQ 1 TSen	OK	47 degrees C / 116 degrees F
FPC 2 MQ 1 Chip	OK	52 degrees C / 125 degrees F
FPC 2 MQ 2 TSen	OK	47 degrees C / 116 degrees F
FPC 2 MQ 2 Chip	OK	45 degrees C / 113 degrees F
FPC 2 MQ 3 TSen	OK	47 degrees C / 116 degrees F
FPC 2 MQ 3 Chip	OK	46 degrees C / 114 degrees F
FPC 3 Intake	OK	40 degrees C / 104 degrees F
FPC 3 Exhaust A	OK	49 degrees C / 120 degrees F
FPC 3 Exhaust B	OK	61 degrees C / 141 degrees F
FPC 3 LU 0 TSen	OK	58 degrees C / 136 degrees F
FPC 3 LU 0 Chip	OK	61 degrees C / 141 degrees F
FPC 3 LU 1 TSen	OK	58 degrees C / 136 degrees F
FPC 3 LU 1 Chip	OK	62 degrees C / 143 degrees F
FPC 3 LU 2 TSen	OK	58 degrees C / 136 degrees F
FPC 3 LU 2 Chip	OK	51 degrees C / 123 degrees F
FPC 3 LU 3 TSen	OK	58 degrees C / 136 degrees F
FPC 3 LU 3 Chip	OK	53 degrees C / 127 degrees F
FPC 3 MQ 0 TSen	OK	48 degrees C / 118 degrees F
FPC 3 MQ 0 Chip	OK	50 degrees C / 122 degrees F
FPC 3 MQ 1 TSen	OK	48 degrees C / 118 degrees F
FPC 3 MQ 1 Chip	OK	54 degrees C / 129 degrees F
FPC 3 MQ 2 TSen	OK	48 degrees C / 118 degrees F
FPC 3 MQ 2 Chip	OK	45 degrees C / 113 degrees F
FPC 3 MQ 3 TSen	OK	48 degrees C / 118 degrees F
FPC 3 MQ 3 Chip	OK	48 degrees C / 118 degrees F
FPC 4 Intake	OK	40 degrees C / 104 degrees F
FPC 4 Exhaust A	OK	49 degrees C / 120 degrees F
FPC 4 Exhaust B	OK	62 degrees C / 143 degrees F
FPC 4 LU 0 TSen	OK	59 degrees C / 138 degrees F

FPC 4 LU 0 Chip	OK	62 degrees C / 143 degrees F
FPC 4 LU 1 TSen	OK	59 degrees C / 138 degrees F
FPC 4 LU 1 Chip	OK	65 degrees C / 149 degrees F
FPC 4 LU 2 TSen	OK	59 degrees C / 138 degrees F
FPC 4 LU 2 Chip	OK	51 degrees C / 123 degrees F
FPC 4 LU 3 TSen	OK	59 degrees C / 138 degrees F
FPC 4 LU 3 Chip	OK	53 degrees C / 127 degrees F
FPC 4 MQ 0 TSen	OK	48 degrees C / 118 degrees F
FPC 4 MQ 0 Chip	OK	52 degrees C / 125 degrees F
FPC 4 MQ 1 TSen	OK	48 degrees C / 118 degrees F
FPC 4 MQ 1 Chip	OK	53 degrees C / 127 degrees F
FPC 4 MQ 2 TSen	OK	48 degrees C / 118 degrees F
FPC 4 MQ 2 Chip	OK	46 degrees C / 114 degrees F
FPC 4 MQ 3 TSen	OK	48 degrees C / 118 degrees F
FPC 4 MQ 3 Chip	OK	47 degrees C / 116 degrees F
FPC 5 Intake	OK	41 degrees C / 105 degrees F
FPC 5 Exhaust A	OK	50 degrees C / 122 degrees F
FPC 5 Exhaust B	OK	63 degrees C / 145 degrees F
FPC 5 LU 0 TSen	OK	60 degrees C / 140 degrees F
FPC 5 LU 0 Chip	OK	63 degrees C / 145 degrees F
FPC 5 LU 1 TSen	OK	60 degrees C / 140 degrees F
FPC 5 LU 1 Chip	OK	66 degrees C / 150 degrees F
FPC 5 LU 2 TSen	OK	60 degrees C / 140 degrees F
FPC 5 LU 2 Chip	OK	56 degrees C / 132 degrees F
FPC 5 LU 3 TSen	OK	60 degrees C / 140 degrees F
FPC 5 LU 3 Chip	OK	54 degrees C / 129 degrees F
FPC 5 MQ 0 TSen	OK	49 degrees C / 120 degrees F
FPC 5 MQ 0 Chip	OK	52 degrees C / 125 degrees F
FPC 5 MQ 1 TSen	OK	49 degrees C / 120 degrees F
FPC 5 MQ 1 Chip	OK	53 degrees C / 127 degrees F
FPC 5 MQ 2 TSen	OK	49 degrees C / 120 degrees F
FPC 5 MQ 2 Chip	OK	48 degrees C / 118 degrees F
FPC 5 MQ 3 TSen	OK	49 degrees C / 120 degrees F
FPC 5 MQ 3 Chip	OK	47 degrees C / 116 degrees F
FPC 6 Intake	OK	42 degrees C / 107 degrees F
FPC 6 Exhaust A	OK	51 degrees C / 123 degrees F
FPC 6 Exhaust B	OK	63 degrees C / 145 degrees F
FPC 6 LU 0 TSen	OK	61 degrees C / 141 degrees F
FPC 6 LU 0 Chip	OK	64 degrees C / 147 degrees F
FPC 6 LU 1 TSen	OK	61 degrees C / 141 degrees F
FPC 6 LU 1 Chip	OK	66 degrees C / 150 degrees F
FPC 6 LU 2 TSen	OK	61 degrees C / 141 degrees F
FPC 6 LU 2 Chip	OK	56 degrees C / 132 degrees F
FPC 6 LU 3 TSen	OK	61 degrees C / 141 degrees F
FPC 6 LU 3 Chip	OK	56 degrees C / 132 degrees F
FPC 6 MQ 0 TSen	OK	50 degrees C / 122 degrees F
FPC 6 MQ 0 Chip	OK	56 degrees C / 132 degrees F
FPC 6 MQ 1 TSen	OK	50 degrees C / 122 degrees F
FPC 6 MQ 1 Chip	OK	59 degrees C / 138 degrees F
FPC 6 MQ 2 TSen	OK	50 degrees C / 122 degrees F
FPC 6 MQ 2 Chip	OK	49 degrees C / 120 degrees F
FPC 6 MQ 3 TSen	OK	50 degrees C / 122 degrees F
FPC 6 MQ 3 Chip	OK	49 degrees C / 120 degrees F
FPC 7 Intake	OK	41 degrees C / 105 degrees F
FPC 7 Exhaust A	OK	51 degrees C / 123 degrees F
FPC 7 Exhaust B	OK	63 degrees C / 145 degrees F
FPC 7 LU 0 TSen	OK	60 degrees C / 140 degrees F
FPC 7 LU 0 Chip	OK	61 degrees C / 141 degrees F
FPC 7 LU 1 TSen	OK	60 degrees C / 140 degrees F
FPC 7 LU 1 Chip	OK	65 degrees C / 149 degrees F

FPC 7 LU 2 TSen	OK	60 degrees C / 140 degrees F
FPC 7 LU 2 Chip	OK	54 degrees C / 129 degrees F
FPC 7 LU 3 TSen	OK	60 degrees C / 140 degrees F
FPC 7 LU 3 Chip	OK	53 degrees C / 127 degrees F
FPC 7 MQ 0 TSen	OK	50 degrees C / 122 degrees F
FPC 7 MQ 0 Chip	OK	53 degrees C / 127 degrees F
FPC 7 MQ 1 TSen	OK	50 degrees C / 122 degrees F
FPC 7 MQ 1 Chip	OK	54 degrees C / 129 degrees F
FPC 7 MQ 2 TSen	OK	50 degrees C / 122 degrees F
FPC 7 MQ 2 Chip	OK	47 degrees C / 116 degrees F
FPC 7 MQ 3 TSen	OK	50 degrees C / 122 degrees F
FPC 7 MQ 3 Chip	OK	47 degrees C / 116 degrees F
FPC 8 Intake	OK	41 degrees C / 105 degrees F
FPC 8 Exhaust A	OK	50 degrees C / 122 degrees F
FPC 8 Exhaust B	OK	62 degrees C / 143 degrees F
FPC 8 LU 0 TSen	OK	59 degrees C / 138 degrees F
FPC 8 LU 0 Chip	OK	62 degrees C / 143 degrees F
FPC 8 LU 1 TSen	OK	59 degrees C / 138 degrees F
FPC 8 LU 1 Chip	OK	64 degrees C / 147 degrees F
FPC 8 LU 2 TSen	OK	59 degrees C / 138 degrees F
FPC 8 LU 2 Chip	OK	55 degrees C / 131 degrees F
FPC 8 LU 3 TSen	OK	59 degrees C / 138 degrees F
FPC 8 LU 3 Chip	OK	54 degrees C / 129 degrees F
FPC 8 MQ 0 TSen	OK	49 degrees C / 120 degrees F
FPC 8 MQ 0 Chip	OK	51 degrees C / 123 degrees F
FPC 8 MQ 1 TSen	OK	49 degrees C / 120 degrees F
FPC 8 MQ 1 Chip	OK	52 degrees C / 125 degrees F
FPC 8 MQ 2 TSen	OK	49 degrees C / 120 degrees F
FPC 8 MQ 2 Chip	OK	46 degrees C / 114 degrees F
FPC 8 MQ 3 TSen	OK	49 degrees C / 120 degrees F
FPC 8 MQ 3 Chip	OK	47 degrees C / 116 degrees F
FPC 9 Intake	OK	42 degrees C / 107 degrees F
FPC 9 Exhaust A	OK	51 degrees C / 123 degrees F
FPC 9 Exhaust B	OK	63 degrees C / 145 degrees F
FPC 9 LU 0 TSen	OK	60 degrees C / 140 degrees F
FPC 9 LU 0 Chip	OK	65 degrees C / 149 degrees F
FPC 9 LU 1 TSen	OK	60 degrees C / 140 degrees F
FPC 9 LU 1 Chip	OK	67 degrees C / 152 degrees F
FPC 9 LU 2 TSen	OK	60 degrees C / 140 degrees F
FPC 9 LU 2 Chip	OK	54 degrees C / 129 degrees F
FPC 9 LU 3 TSen	OK	60 degrees C / 140 degrees F
FPC 9 LU 3 Chip	OK	54 degrees C / 129 degrees F
FPC 9 MQ 0 TSen	OK	51 degrees C / 123 degrees F
FPC 9 MQ 0 Chip	OK	55 degrees C / 131 degrees F
FPC 9 MQ 1 TSen	OK	51 degrees C / 123 degrees F
FPC 9 MQ 1 Chip	OK	59 degrees C / 138 degrees F
FPC 9 MQ 2 TSen	OK	51 degrees C / 123 degrees F
FPC 9 MQ 2 Chip	OK	49 degrees C / 120 degrees F
FPC 9 MQ 3 TSen	OK	51 degrees C / 123 degrees F
FPC 9 MQ 3 Chip	OK	49 degrees C / 120 degrees F
FPC 10 Intake	OK	44 degrees C / 111 degrees F
FPC 10 Exhaust A	OK	49 degrees C / 120 degrees F
FPC 10 Exhaust B	OK	55 degrees C / 131 degrees F
FPC 10 LU 0 TSen	OK	54 degrees C / 129 degrees F
FPC 10 LU 0 Chip	OK	55 degrees C / 131 degrees F
FPC 10 LU 1 TSen	OK	54 degrees C / 129 degrees F
FPC 10 LU 1 Chip	OK	59 degrees C / 138 degrees F
FPC 10 LU 2 TSen	OK	54 degrees C / 129 degrees F
FPC 10 LU 2 Chip	OK	52 degrees C / 125 degrees F
FPC 10 LU 3 TSen	OK	54 degrees C / 129 degrees F

FPC 10 LU 3 Chip	OK	51 degrees C / 123 degrees F
FPC 10 MQ 0 TSen	OK	48 degrees C / 118 degrees F
FPC 10 MQ 0 Chip	OK	49 degrees C / 120 degrees F
FPC 10 MQ 1 TSen	OK	48 degrees C / 118 degrees F
FPC 10 MQ 1 Chip	OK	52 degrees C / 125 degrees F
FPC 10 MQ 2 TSen	OK	48 degrees C / 118 degrees F
FPC 10 MQ 2 Chip	OK	47 degrees C / 116 degrees F
FPC 10 MQ 3 TSen	OK	48 degrees C / 118 degrees F
FPC 10 MQ 3 Chip	OK	47 degrees C / 116 degrees F
FPC 11 Intake	OK	30 degrees C / 86 degrees F
FPC 11 Exhaust A	OK	35 degrees C / 95 degrees F
FPC 11 Exhaust B	OK	30 degrees C / 86 degrees F
FPC 11 LU 0 TSen	OK	57 degrees C / 134 degrees F
FPC 11 LU 0 Chip	OK	58 degrees C / 136 degrees F
FPC 11 LU 1 TSen	OK	57 degrees C / 134 degrees F
FPC 11 LU 1 Chip	OK	62 degrees C / 143 degrees F
FPC 11 LU 2 TSen	OK	57 degrees C / 134 degrees F
FPC 11 LU 2 Chip	OK	53 degrees C / 127 degrees F
FPC 11 LU 3 TSen	OK	57 degrees C / 134 degrees F
FPC 11 LU 3 Chip	OK	54 degrees C / 129 degrees F
FPC 11 MQ 0 TSen	OK	52 degrees C / 125 degrees F
FPC 11 MQ 0 Chip	OK	52 degrees C / 125 degrees F
FPC 11 MQ 1 TSen	OK	52 degrees C / 125 degrees F
FPC 11 MQ 1 Chip	OK	57 degrees C / 134 degrees F
FPC 11 MQ 2 TSen	OK	52 degrees C / 125 degrees F
FPC 11 MQ 2 Chip	OK	48 degrees C / 118 degrees F
FPC 11 MQ 3 TSen	OK	52 degrees C / 125 degrees F
FPC 11 MQ 3 Chip	OK	52 degrees C / 125 degrees F
FPC 12 Intake	OK	40 degrees C / 104 degrees F
FPC 12 Exhaust A	OK	47 degrees C / 116 degrees F
FPC 12 Exhaust B	OK	52 degrees C / 125 degrees F
FPC 12 LU 0 TSen	OK	51 degrees C / 123 degrees F
FPC 12 LU 0 Chip	OK	52 degrees C / 125 degrees F
FPC 12 LU 1 TSen	OK	51 degrees C / 123 degrees F
FPC 12 LU 1 Chip	OK	55 degrees C / 131 degrees F
FPC 12 LU 2 TSen	OK	51 degrees C / 123 degrees F
FPC 12 LU 2 Chip	OK	47 degrees C / 116 degrees F
FPC 12 LU 3 TSen	OK	51 degrees C / 123 degrees F
FPC 12 LU 3 Chip	OK	50 degrees C / 122 degrees F
FPC 12 MQ 0 TSen	OK	46 degrees C / 114 degrees F
FPC 12 MQ 0 Chip	OK	46 degrees C / 114 degrees F
FPC 12 MQ 1 TSen	OK	46 degrees C / 114 degrees F
FPC 12 MQ 1 Chip	OK	50 degrees C / 122 degrees F
FPC 12 MQ 2 TSen	OK	46 degrees C / 114 degrees F
FPC 12 MQ 2 Chip	OK	44 degrees C / 111 degrees F
FPC 12 MQ 3 TSen	OK	46 degrees C / 114 degrees F
FPC 12 MQ 3 Chip	OK	46 degrees C / 114 degrees F
FPC 13 Intake	OK	40 degrees C / 104 degrees F
FPC 13 Exhaust A	OK	48 degrees C / 118 degrees F
FPC 13 Exhaust B	OK	52 degrees C / 125 degrees F
FPC 13 LU 0 TSen	OK	51 degrees C / 123 degrees F
FPC 13 LU 0 Chip	OK	52 degrees C / 125 degrees F
FPC 13 LU 1 TSen	OK	51 degrees C / 123 degrees F
FPC 13 LU 1 Chip	OK	55 degrees C / 131 degrees F
FPC 13 LU 2 TSen	OK	51 degrees C / 123 degrees F
FPC 13 LU 2 Chip	OK	48 degrees C / 118 degrees F
FPC 13 LU 3 TSen	OK	51 degrees C / 123 degrees F
FPC 13 LU 3 Chip	OK	48 degrees C / 118 degrees F
FPC 13 MQ 0 TSen	OK	46 degrees C / 114 degrees F
FPC 13 MQ 0 Chip	OK	46 degrees C / 114 degrees F

FPC 13 MQ 1 TSen	OK	46 degrees C / 114 degrees F
FPC 13 MQ 1 Chip	OK	50 degrees C / 122 degrees F
FPC 13 MQ 2 TSen	OK	46 degrees C / 114 degrees F
FPC 13 MQ 2 Chip	OK	44 degrees C / 111 degrees F
FPC 13 MQ 3 TSen	OK	46 degrees C / 114 degrees F
FPC 13 MQ 3 Chip	OK	46 degrees C / 114 degrees F
FPC 14 Intake	OK	40 degrees C / 104 degrees F
FPC 14 Exhaust A	OK	50 degrees C / 122 degrees F
FPC 14 Exhaust B	OK	51 degrees C / 123 degrees F
FPC 14 LU 0 TSen	OK	50 degrees C / 122 degrees F
FPC 14 LU 0 Chip	OK	50 degrees C / 122 degrees F
FPC 14 LU 1 TSen	OK	50 degrees C / 122 degrees F
FPC 14 LU 1 Chip	OK	54 degrees C / 129 degrees F
FPC 14 LU 2 TSen	OK	50 degrees C / 122 degrees F
FPC 14 LU 2 Chip	OK	47 degrees C / 116 degrees F
FPC 14 LU 3 TSen	OK	50 degrees C / 122 degrees F
FPC 14 LU 3 Chip	OK	49 degrees C / 120 degrees F
FPC 14 MQ 0 TSen	OK	47 degrees C / 116 degrees F
FPC 14 MQ 0 Chip	OK	46 degrees C / 114 degrees F
FPC 14 MQ 1 TSen	OK	47 degrees C / 116 degrees F
FPC 14 MQ 1 Chip	OK	51 degrees C / 123 degrees F
FPC 14 MQ 2 TSen	OK	47 degrees C / 116 degrees F
FPC 14 MQ 2 Chip	OK	45 degrees C / 113 degrees F
FPC 14 MQ 3 TSen	OK	47 degrees C / 116 degrees F
FPC 14 MQ 3 Chip	OK	48 degrees C / 118 degrees F
FPC 15 Intake	OK	44 degrees C / 111 degrees F
FPC 15 Exhaust A	OK	49 degrees C / 120 degrees F
FPC 15 Exhaust B	OK	60 degrees C / 140 degrees F
FPC 15 LU 0 TSen	OK	50 degrees C / 122 degrees F
FPC 15 LU 0 Chip	OK	56 degrees C / 132 degrees F
FPC 15 LU 1 TSen	OK	50 degrees C / 122 degrees F
FPC 15 LU 1 Chip	OK	50 degrees C / 122 degrees F
FPC 15 LU 2 TSen	OK	50 degrees C / 122 degrees F
FPC 15 LU 2 Chip	OK	58 degrees C / 136 degrees F
FPC 15 LU 3 TSen	OK	50 degrees C / 122 degrees F
FPC 15 LU 3 Chip	OK	63 degrees C / 145 degrees F
FPC 15 XM 0 TSen	OK	50 degrees C / 122 degrees F
FPC 15 XM 0 Chip	OK	56 degrees C / 132 degrees F
FPC 15 XF 0 TSen	OK	50 degrees C / 122 degrees F
FPC 15 XF 0 Chip	OK	68 degrees C / 154 degrees F
FPC 15 PLX Switch TSen	OK	50 degrees C / 122 degrees F
FPC 15 PLX Switch Chip	OK	56 degrees C / 132 degrees F
FPC 16 Intake	OK	42 degrees C / 107 degrees F
FPC 16 Exhaust A	OK	51 degrees C / 123 degrees F
FPC 16 Exhaust B	OK	53 degrees C / 127 degrees F
FPC 16 LU 0 TSen	OK	51 degrees C / 123 degrees F
FPC 16 LU 0 Chip	OK	52 degrees C / 125 degrees F
FPC 16 LU 1 TSen	OK	51 degrees C / 123 degrees F
FPC 16 LU 1 Chip	OK	55 degrees C / 131 degrees F
FPC 16 LU 2 TSen	OK	51 degrees C / 123 degrees F
FPC 16 LU 2 Chip	OK	48 degrees C / 118 degrees F
FPC 16 LU 3 TSen	OK	51 degrees C / 123 degrees F
FPC 16 LU 3 Chip	OK	49 degrees C / 120 degrees F
FPC 16 MQ 0 TSen	OK	49 degrees C / 120 degrees F
FPC 16 MQ 0 Chip	OK	48 degrees C / 118 degrees F
FPC 16 MQ 1 TSen	OK	49 degrees C / 120 degrees F
FPC 16 MQ 1 Chip	OK	53 degrees C / 127 degrees F
FPC 16 MQ 2 TSen	OK	49 degrees C / 120 degrees F
FPC 16 MQ 2 Chip	OK	46 degrees C / 114 degrees F
FPC 16 MQ 3 TSen	OK	49 degrees C / 120 degrees F

FPC 16 MQ 3 Chip	OK	49 degrees C / 120 degrees F
FPC 17 Intake	OK	43 degrees C / 109 degrees F
FPC 17 Exhaust A	OK	51 degrees C / 123 degrees F
FPC 17 Exhaust B	OK	55 degrees C / 131 degrees F
FPC 17 LU 0 TSen	OK	54 degrees C / 129 degrees F
FPC 17 LU 0 Chip	OK	57 degrees C / 134 degrees F
FPC 17 LU 1 TSen	OK	54 degrees C / 129 degrees F
FPC 17 LU 1 Chip	OK	60 degrees C / 140 degrees F
FPC 17 LU 2 TSen	OK	54 degrees C / 129 degrees F
FPC 17 LU 2 Chip	OK	53 degrees C / 127 degrees F
FPC 17 LU 3 TSen	OK	54 degrees C / 129 degrees F
FPC 17 LU 3 Chip	OK	53 degrees C / 127 degrees F
FPC 17 MQ 0 TSen	OK	49 degrees C / 120 degrees F
FPC 17 MQ 0 Chip	OK	50 degrees C / 122 degrees F
FPC 17 MQ 1 TSen	OK	49 degrees C / 120 degrees F
FPC 17 MQ 1 Chip	OK	54 degrees C / 129 degrees F
FPC 17 MQ 2 TSen	OK	49 degrees C / 120 degrees F
FPC 17 MQ 2 Chip	OK	47 degrees C / 116 degrees F
FPC 17 MQ 3 TSen	OK	49 degrees C / 120 degrees F
FPC 17 MQ 3 Chip	OK	51 degrees C / 123 degrees F
FPC 18 Intake	OK	44 degrees C / 111 degrees F
FPC 18 Exhaust A	OK	53 degrees C / 127 degrees F
FPC 18 Exhaust B	OK	57 degrees C / 134 degrees F
FPC 18 LU 0 TSen	OK	56 degrees C / 132 degrees F
FPC 18 LU 0 Chip	OK	57 degrees C / 134 degrees F
FPC 18 LU 1 TSen	OK	56 degrees C / 132 degrees F
FPC 18 LU 1 Chip	OK	62 degrees C / 143 degrees F
FPC 18 LU 2 TSen	OK	56 degrees C / 132 degrees F
FPC 18 LU 2 Chip	OK	53 degrees C / 127 degrees F
FPC 18 LU 3 TSen	OK	56 degrees C / 132 degrees F
FPC 18 LU 3 Chip	OK	55 degrees C / 131 degrees F
FPC 18 MQ 0 TSen	OK	51 degrees C / 123 degrees F
FPC 18 MQ 0 Chip	OK	54 degrees C / 129 degrees F
FPC 18 MQ 1 TSen	OK	51 degrees C / 123 degrees F
FPC 18 MQ 1 Chip	OK	58 degrees C / 136 degrees F
FPC 18 MQ 2 TSen	OK	51 degrees C / 123 degrees F
FPC 18 MQ 2 Chip	OK	50 degrees C / 122 degrees F
FPC 18 MQ 3 TSen	OK	51 degrees C / 123 degrees F
FPC 18 MQ 3 Chip	OK	53 degrees C / 127 degrees F
FPC 19 Intake	OK	48 degrees C / 118 degrees F
FPC 19 Exhaust A	OK	56 degrees C / 132 degrees F
FPC 19 Exhaust B	OK	64 degrees C / 147 degrees F
FPC 19 LU 0 TSen	OK	63 degrees C / 145 degrees F
FPC 19 LU 0 Chip	OK	64 degrees C / 147 degrees F
FPC 19 LU 1 TSen	OK	63 degrees C / 145 degrees F
FPC 19 LU 1 Chip	OK	70 degrees C / 158 degrees F
FPC 19 LU 2 TSen	OK	63 degrees C / 145 degrees F
FPC 19 LU 2 Chip	OK	61 degrees C / 141 degrees F
FPC 19 LU 3 TSen	OK	63 degrees C / 145 degrees F
FPC 19 LU 3 Chip	OK	62 degrees C / 143 degrees F
FPC 19 MQ 0 TSen	OK	56 degrees C / 132 degrees F
FPC 19 MQ 0 Chip	OK	60 degrees C / 140 degrees F
FPC 19 MQ 1 TSen	OK	56 degrees C / 132 degrees F
FPC 19 MQ 1 Chip	OK	62 degrees C / 143 degrees F
FPC 19 MQ 2 TSen	OK	56 degrees C / 132 degrees F
FPC 19 MQ 2 Chip	OK	56 degrees C / 132 degrees F
FPC 19 MQ 3 TSen	OK	56 degrees C / 132 degrees F
FPC 19 MQ 3 Chip	OK	57 degrees C / 134 degrees F
ADC 0 Intake	OK	40 degrees C / 104 degrees F
ADC 0 Exhaust	OK	52 degrees C / 125 degrees F

ADC 0 ADC-XF1	OK	59 degrees C / 138 degrees F
ADC 0 ADC-XF0	OK	66 degrees C / 150 degrees F
ADC 1 Intake	OK	38 degrees C / 100 degrees F
ADC 1 Exhaust	OK	50 degrees C / 122 degrees F
ADC 1 ADC-XF1	OK	59 degrees C / 138 degrees F
ADC 1 ADC-XF0	OK	63 degrees C / 145 degrees F
ADC 2 Intake	OK	37 degrees C / 98 degrees F
ADC 2 Exhaust	OK	52 degrees C / 125 degrees F
ADC 2 ADC-XF1	OK	53 degrees C / 127 degrees F
ADC 2 ADC-XF0	OK	61 degrees C / 141 degrees F
ADC 3 Intake	OK	40 degrees C / 104 degrees F
ADC 3 Exhaust	OK	51 degrees C / 123 degrees F
ADC 3 ADC-XF1	OK	61 degrees C / 141 degrees F
ADC 3 ADC-XF0	OK	64 degrees C / 147 degrees F
ADC 4 Intake	OK	39 degrees C / 102 degrees F
ADC 4 Exhaust	OK	51 degrees C / 123 degrees F
ADC 4 ADC-XF1	OK	60 degrees C / 140 degrees F
ADC 4 ADC-XF0	OK	63 degrees C / 145 degrees F
ADC 5 Intake	OK	38 degrees C / 100 degrees F
ADC 5 Exhaust	OK	54 degrees C / 129 degrees F
ADC 5 ADC-XF1	OK	56 degrees C / 132 degrees F
ADC 5 ADC-XF0	OK	67 degrees C / 152 degrees F
ADC 6 Intake	OK	39 degrees C / 102 degrees F
ADC 6 Exhaust	OK	52 degrees C / 125 degrees F
ADC 6 ADC-XF1	OK	59 degrees C / 138 degrees F
ADC 6 ADC-XF0	OK	66 degrees C / 150 degrees F
ADC 7 Intake	OK	39 degrees C / 102 degrees F
ADC 7 Exhaust	OK	54 degrees C / 129 degrees F
ADC 7 ADC-XF1	OK	62 degrees C / 143 degrees F
ADC 7 ADC-XF0	OK	70 degrees C / 158 degrees F
ADC 8 Intake	OK	39 degrees C / 102 degrees F
ADC 8 Exhaust	OK	52 degrees C / 125 degrees F
ADC 8 ADC-XF1	OK	61 degrees C / 141 degrees F
ADC 8 ADC-XF0	OK	65 degrees C / 149 degrees F
ADC 9 Intake	OK	41 degrees C / 105 degrees F
ADC 9 Exhaust	OK	51 degrees C / 123 degrees F
ADC 9 ADC-XF1	OK	63 degrees C / 145 degrees F
ADC 9 ADC-XF0	OK	63 degrees C / 145 degrees F
ADC 10 Intake	OK	48 degrees C / 118 degrees F
ADC 10 Exhaust	OK	53 degrees C / 127 degrees F
ADC 10 ADC-XF1	OK	67 degrees C / 152 degrees F
ADC 10 ADC-XF0	OK	66 degrees C / 150 degrees F
ADC 12 Intake	OK	49 degrees C / 120 degrees F
ADC 12 Exhaust	OK	54 degrees C / 129 degrees F
ADC 12 ADC-XF1	OK	67 degrees C / 152 degrees F
ADC 12 ADC-XF0	OK	67 degrees C / 152 degrees F
ADC 13 Intake	OK	49 degrees C / 120 degrees F
ADC 13 Exhaust	OK	57 degrees C / 134 degrees F
ADC 13 ADC-XF1	OK	66 degrees C / 150 degrees F
ADC 13 ADC-XF0	OK	69 degrees C / 156 degrees F
ADC 14 Intake	OK	51 degrees C / 123 degrees F
ADC 14 Exhaust	OK	59 degrees C / 138 degrees F
ADC 14 ADC-XF1	OK	69 degrees C / 156 degrees F
ADC 14 ADC-XF0	OK	74 degrees C / 165 degrees F
ADC 15 Intake	OK	50 degrees C / 122 degrees F
ADC 15 Exhaust	OK	59 degrees C / 138 degrees F
ADC 15 ADC-XF1	OK	68 degrees C / 154 degrees F
ADC 15 ADC-XF0	OK	69 degrees C / 156 degrees F
ADC 16 Intake	OK	52 degrees C / 125 degrees F
ADC 16 Exhaust	OK	58 degrees C / 136 degrees F

Fans	ADC 16 ADC-XF1	OK	68 degrees C / 154 degrees F
	ADC 16 ADC-XF0	OK	70 degrees C / 158 degrees F
	ADC 17 Intake	OK	52 degrees C / 125 degrees F
	ADC 17 Exhaust	OK	59 degrees C / 138 degrees F
	ADC 17 ADC-XF1	OK	69 degrees C / 156 degrees F
	ADC 17 ADC-XF0	OK	71 degrees C / 159 degrees F
	ADC 18 Intake	OK	53 degrees C / 127 degrees F
	ADC 18 Exhaust	OK	59 degrees C / 138 degrees F
	ADC 18 ADC-XF1	OK	68 degrees C / 154 degrees F
	ADC 18 ADC-XF0	OK	73 degrees C / 163 degrees F
	ADC 19 Intake	OK	50 degrees C / 122 degrees F
	ADC 19 Exhaust	OK	59 degrees C / 138 degrees F
	ADC 19 ADC-XF1	OK	68 degrees C / 154 degrees F
	ADC 19 ADC-XF0	OK	72 degrees C / 161 degrees F
	Fan Tray 0 Fan 1	OK	7440 RPM
	Fan Tray 0 Fan 2	OK	7200 RPM
	Fan Tray 0 Fan 3	OK	6960 RPM
	Fan Tray 0 Fan 4	OK	7200 RPM
	Fan Tray 0 Fan 5	OK	7080 RPM
	Fan Tray 0 Fan 6	OK	6840 RPM
	Fan Tray 1 Fan 1	OK	6840 RPM
	Fan Tray 1 Fan 2	OK	6960 RPM
	Fan Tray 1 Fan 3	OK	6960 RPM
	Fan Tray 1 Fan 4	OK	7080 RPM
	Fan Tray 1 Fan 5	OK	6960 RPM
	Fan Tray 1 Fan 6	OK	6960 RPM
	Fan Tray 2 Fan 1	OK	8640 RPM
	Fan Tray 2 Fan 2	OK	8640 RPM
	Fan Tray 2 Fan 3	OK	8760 RPM
	Fan Tray 2 Fan 4	OK	8760 RPM
	Fan Tray 2 Fan 5	OK	8640 RPM
	Fan Tray 2 Fan 6	OK	8640 RPM
	Fan Tray 3 Fan 1	OK	8520 RPM
	Fan Tray 3 Fan 2	OK	8520 RPM
	Fan Tray 3 Fan 3	OK	8640 RPM
	Fan Tray 3 Fan 4	OK	8640 RPM
	Fan Tray 3 Fan 5	OK	8520 RPM
	Fan Tray 3 Fan 6	OK	8520 RPM

## show chassis environment (MX2020 Router with MPC5EQ and MPC6E)

Class	Item	Status	Measurement
Temp	PSM 0	OK	32 degrees C / 89 degrees F
	PSM 1	OK	32 degrees C / 89 degrees F
	PSM 2	OK	32 degrees C / 89 degrees F
	PSM 3	OK	32 degrees C / 89 degrees F
	PSM 4	OK	32 degrees C / 89 degrees F
	PSM 5	OK	33 degrees C / 91 degrees F
	PSM 6	OK	32 degrees C / 89 degrees F
	PSM 7	OK	32 degrees C / 89 degrees F
	PSM 8	OK	32 degrees C / 89 degrees F
	PSM 9	Absent	
	PSM 10	Absent	
	PSM 11	Absent	
	PSM 12	OK	33 degrees C / 91 degrees F
	PSM 13	OK	33 degrees C / 91 degrees F
	PSM 14	OK	34 degrees C / 93 degrees F
	PSM 15	OK	34 degrees C / 93 degrees F
	PSM 16	OK	33 degrees C / 91 degrees F



PSM 17	OK	33 degrees C / 91 degrees F
PDM 0	OK	
PDM 1	OK	
PDM 2	OK	
PDM 3	OK	
CB 0 IntakeA-Zone0	OK	34 degrees C / 93 degrees F
CB 0 IntakeB-Zone1	OK	26 degrees C / 78 degrees F
CB 0 IntakeC-Zone0	OK	38 degrees C / 100 degrees F
CB 0 ExhaustA-Zone0	OK	34 degrees C / 93 degrees F
CB 0 ExhaustB-Zone1	OK	27 degrees C / 80 degrees F
CB 0 TCBC-Zone0	OK	32 degrees C / 89 degrees F
CB 1 IntakeA-Zone0	OK	24 degrees C / 75 degrees F
CB 1 IntakeB-Zone1	OK	22 degrees C / 71 degrees F
CB 1 IntakeC-Zone0	OK	34 degrees C / 93 degrees F
CB 1 ExhaustA-Zone0	OK	31 degrees C / 87 degrees F
CB 1 ExhaustB-Zone1	OK	24 degrees C / 75 degrees F
CB 1 TCBC-Zone0	OK	27 degrees C / 80 degrees F
SPMB 0 Intake	OK	25 degrees C / 77 degrees F
SPMB 1 Intake	OK	23 degrees C / 73 degrees F
Routing Engine 0	OK	28 degrees C / 82 degrees F
Routing Engine 0 CPU	OK	25 degrees C / 77 degrees F
Routing Engine 1	OK	25 degrees C / 77 degrees F
Routing Engine 1 CPU	OK	24 degrees C / 75 degrees F
SFB 0 Intake-Zone0	OK	45 degrees C / 113 degrees F
SFB 0 Exhaust-Zone1	OK	34 degrees C / 93 degrees F
SFB 0 IntakeA-Zone0	OK	32 degrees C / 89 degrees F
SFB 0 IntakeB-Zone1	OK	28 degrees C / 82 degrees F
SFB 0 Exhaust-Zone0	OK	36 degrees C / 96 degrees F
SFB 0 SFB-XF2-Zone1	OK	46 degrees C / 114 degrees F
SFB 0 SFB-XF1-Zone0	OK	48 degrees C / 118 degrees F
SFB 0 SFB-XF0-Zone0	OK	60 degrees C / 140 degrees F
SFB 1 Intake-Zone0	OK	44 degrees C / 111 degrees F
SFB 1 Exhaust-Zone1	OK	34 degrees C / 93 degrees F
SFB 1 IntakeA-Zone0	OK	35 degrees C / 95 degrees F
SFB 1 IntakeB-Zone1	OK	27 degrees C / 80 degrees F
SFB 1 Exhaust-Zone0	OK	37 degrees C / 98 degrees F
SFB 1 SFB-XF2-Zone1	OK	47 degrees C / 116 degrees F
SFB 1 SFB-XF1-Zone0	OK	49 degrees C / 120 degrees F
SFB 1 SFB-XF0-Zone0	OK	56 degrees C / 132 degrees F
SFB 2 Intake-Zone0	OK	41 degrees C / 105 degrees F
SFB 2 Exhaust-Zone1	OK	34 degrees C / 93 degrees F
SFB 2 IntakeA-Zone0	OK	35 degrees C / 95 degrees F
SFB 2 IntakeB-Zone1	OK	28 degrees C / 82 degrees F
SFB 2 Exhaust-Zone0	OK	37 degrees C / 98 degrees F
SFB 2 SFB-XF2-Zone1	OK	47 degrees C / 116 degrees F
SFB 2 SFB-XF1-Zone0	OK	55 degrees C / 131 degrees F
SFB 2 SFB-XF0-Zone0	OK	55 degrees C / 131 degrees F
SFB 3 Intake-Zone0	OK	43 degrees C / 109 degrees F
SFB 3 Exhaust-Zone1	OK	33 degrees C / 91 degrees F
SFB 3 IntakeA-Zone0	OK	35 degrees C / 95 degrees F
SFB 3 IntakeB-Zone1	OK	27 degrees C / 80 degrees F
SFB 3 Exhaust-Zone0	OK	36 degrees C / 96 degrees F
SFB 3 SFB-XF2-Zone1	OK	46 degrees C / 114 degrees F
SFB 3 SFB-XF1-Zone0	OK	46 degrees C / 114 degrees F
SFB 3 SFB-XF0-Zone0	OK	57 degrees C / 134 degrees F
SFB 4 Intake-Zone0	OK	36 degrees C / 96 degrees F
SFB 4 Exhaust-Zone1	OK	32 degrees C / 89 degrees F
SFB 4 IntakeA-Zone0	OK	31 degrees C / 87 degrees F
SFB 4 IntakeB-Zone1	OK	26 degrees C / 78 degrees F
SFB 4 Exhaust-Zone0	OK	32 degrees C / 89 degrees F

SFB 4 SFB-XF2-Zone1	OK	44 degrees C / 111 degrees F
SFB 4 SFB-XF1-Zone0	OK	45 degrees C / 113 degrees F
SFB 4 SFB-XF0-Zone0	OK	52 degrees C / 125 degrees F
SFB 5 Intake-Zone0	OK	31 degrees C / 87 degrees F
SFB 5 Exhaust-Zone1	OK	30 degrees C / 86 degrees F
SFB 5 IntakeA-Zone0	OK	26 degrees C / 78 degrees F
SFB 5 IntakeB-Zone1	OK	24 degrees C / 75 degrees F
SFB 5 Exhaust-Zone0	OK	29 degrees C / 84 degrees F
SFB 5 SFB-XF2-Zone1	OK	43 degrees C / 109 degrees F
SFB 5 SFB-XF1-Zone0	OK	47 degrees C / 116 degrees F
SFB 5 SFB-XF0-Zone0	OK	49 degrees C / 120 degrees F
SFB 6 Intake-Zone0	OK	30 degrees C / 86 degrees F
SFB 6 Exhaust-Zone1	OK	29 degrees C / 84 degrees F
SFB 6 IntakeA-Zone0	OK	25 degrees C / 77 degrees F
SFB 6 IntakeB-Zone1	OK	24 degrees C / 75 degrees F
SFB 6 Exhaust-Zone0	OK	29 degrees C / 84 degrees F
SFB 6 SFB-XF2-Zone1	OK	43 degrees C / 109 degrees F
SFB 6 SFB-XF1-Zone0	OK	44 degrees C / 111 degrees F
SFB 6 SFB-XF0-Zone0	OK	45 degrees C / 113 degrees F
SFB 7 Intake-Zone0	OK	31 degrees C / 87 degrees F
SFB 7 Exhaust-Zone1	OK	30 degrees C / 86 degrees F
SFB 7 IntakeA-Zone0	OK	26 degrees C / 78 degrees F
SFB 7 IntakeB-Zone1	OK	24 degrees C / 75 degrees F
SFB 7 Exhaust-Zone0	OK	28 degrees C / 82 degrees F
SFB 7 SFB-XF2-Zone1	OK	50 degrees C / 122 degrees F
SFB 7 SFB-XF1-Zone0	OK	43 degrees C / 109 degrees F
SFB 7 SFB-XF0-Zone0	OK	47 degrees C / 116 degrees F
FPC 0 Intake	OK	31 degrees C / 87 degrees F
FPC 0 Exhaust A	OK	49 degrees C / 120 degrees F
FPC 0 Exhaust B	OK	43 degrees C / 109 degrees F
FPC 0 XL TSen	OK	42 degrees C / 107 degrees F
FPC 0 XL Chip	OK	46 degrees C / 114 degrees F
FPC 0 XL_XR0 TSen	OK	42 degrees C / 107 degrees F
FPC 0 XL_XR0 Chip	OK	48 degrees C / 118 degrees F
FPC 0 XL_XR1 TSen	OK	42 degrees C / 107 degrees F
FPC 0 XL_XR1 Chip	OK	48 degrees C / 118 degrees F
FPC 0 XQ TSen	OK	42 degrees C / 107 degrees F
FPC 0 XQ Chip	OK	44 degrees C / 111 degrees F
FPC 0 XQ_XR0 TSen	OK	42 degrees C / 107 degrees F
FPC 0 XQ_XR0 Chip	OK	57 degrees C / 134 degrees F
FPC 0 XQ_XR1 TSen	OK	42 degrees C / 107 degrees F
FPC 0 XQ_XR1 Chip	OK	55 degrees C / 131 degrees F
FPC 0 XM 0 TSen	OK	48 degrees C / 118 degrees F
FPC 0 XM 0 Chip	OK	62 degrees C / 143 degrees F
FPC 0 XM 1 TSen	OK	48 degrees C / 118 degrees F
FPC 0 XM 1 Chip	OK	44 degrees C / 111 degrees F
FPC 0 PLX PCIe Switch TSe	OK	48 degrees C / 118 degrees F
FPC 0 PLX PCIe Switch Chi	OK	57 degrees C / 134 degrees F
FPC 1 Intake	OK	29 degrees C / 84 degrees F
FPC 1 Exhaust A	OK	36 degrees C / 96 degrees F
FPC 1 Exhaust B	OK	44 degrees C / 111 degrees F
FPC 1 LU 0 TSen	OK	38 degrees C / 100 degrees F
FPC 1 LU 0 Chip	OK	45 degrees C / 113 degrees F
FPC 1 LU 1 TSen	OK	38 degrees C / 100 degrees F
FPC 1 LU 1 Chip	OK	38 degrees C / 100 degrees F
FPC 1 LU 2 TSen	OK	38 degrees C / 100 degrees F
FPC 1 LU 2 Chip	OK	42 degrees C / 107 degrees F
FPC 1 LU 3 TSen	OK	38 degrees C / 100 degrees F
FPC 1 LU 3 Chip	OK	47 degrees C / 116 degrees F
FPC 1 XM 0 TSen	OK	38 degrees C / 100 degrees F

FPC 1 XM 0 Chip	OK	44 degrees C / 111 degrees F
FPC 1 XF 0 TSen	OK	38 degrees C / 100 degrees F
FPC 1 XF 0 Chip	OK	54 degrees C / 129 degrees F
FPC 1 PLX Switch TSen	OK	38 degrees C / 100 degrees F
FPC 1 PLX Switch Chip	OK	41 degrees C / 105 degrees F
FPC 2 Intake	OK	28 degrees C / 82 degrees F
FPC 2 Exhaust A	OK	28 degrees C / 82 degrees F
FPC 2 Exhaust B	OK	28 degrees C / 82 degrees F
FPC 2 LU 0 TSen	OK	40 degrees C / 104 degrees F
FPC 2 LU 0 Chip	OK	40 degrees C / 104 degrees F
FPC 2 LU 1 TSen	OK	40 degrees C / 104 degrees F
FPC 2 LU 1 Chip	OK	41 degrees C / 105 degrees F
FPC 2 LU 2 TSen	OK	40 degrees C / 104 degrees F
FPC 2 LU 2 Chip	OK	34 degrees C / 93 degrees F
FPC 2 LU 3 TSen	OK	40 degrees C / 104 degrees F
FPC 2 LU 3 Chip	OK	38 degrees C / 100 degrees F
FPC 2 XM 0 TSen	OK	40 degrees C / 104 degrees F
FPC 2 XM 0 Chip	OK	47 degrees C / 116 degrees F
FPC 2 XM 1 TSen	OK	40 degrees C / 104 degrees F
FPC 2 XM 1 Chip	OK	42 degrees C / 107 degrees F
FPC 2 PLX Switch TSen	OK	40 degrees C / 104 degrees F
FPC 2 PLX Switch Chip	OK	39 degrees C / 102 degrees F
FPC 3 Intake	OK	27 degrees C / 80 degrees F
FPC 3 Exhaust A	OK	38 degrees C / 100 degrees F
FPC 3 Exhaust B	OK	31 degrees C / 87 degrees F
FPC 3 QX 0 TSen	OK	38 degrees C / 100 degrees F
FPC 3 QX 0 Chip	OK	42 degrees C / 107 degrees F
FPC 3 LU 0 TCAM TSen	OK	38 degrees C / 100 degrees F
FPC 3 LU 0 TCAM Chip	OK	43 degrees C / 109 degrees F
FPC 3 LU 0 TSen	OK	38 degrees C / 100 degrees F
FPC 3 LU 0 Chip	OK	42 degrees C / 107 degrees F
FPC 3 MQ 0 TSen	OK	38 degrees C / 100 degrees F
FPC 3 MQ 0 Chip	OK	39 degrees C / 102 degrees F
FPC 3 QX 1 TSen	OK	32 degrees C / 89 degrees F
FPC 3 QX 1 Chip	OK	36 degrees C / 96 degrees F
FPC 3 LU 1 TCAM TSen	OK	32 degrees C / 89 degrees F
FPC 3 LU 1 TCAM Chip	OK	35 degrees C / 95 degrees F
FPC 3 LU 1 TSen	OK	32 degrees C / 89 degrees F
FPC 3 LU 1 Chip	OK	37 degrees C / 98 degrees F
FPC 3 MQ 1 TSen	OK	32 degrees C / 89 degrees F
FPC 3 MQ 1 Chip	OK	36 degrees C / 96 degrees F
FPC 4 Intake	OK	29 degrees C / 84 degrees F
FPC 4 Exhaust A	OK	36 degrees C / 96 degrees F
FPC 4 Exhaust B	OK	40 degrees C / 104 degrees F
FPC 4 XL TSen	OK	39 degrees C / 102 degrees F
FPC 4 XL Chip	OK	42 degrees C / 107 degrees F
FPC 4 XL_XR0 TSen	OK	39 degrees C / 102 degrees F
FPC 4 XL_XR0 Chip	OK	45 degrees C / 113 degrees F
FPC 4 XL_XR1 TSen	OK	39 degrees C / 102 degrees F
FPC 4 XL_XR1 Chip	OK	46 degrees C / 114 degrees F
FPC 4 XQ TSen	OK	39 degrees C / 102 degrees F
FPC 4 XQ Chip	OK	42 degrees C / 107 degrees F
FPC 4 XQ_XR0 TSen	OK	39 degrees C / 102 degrees F
FPC 4 XQ_XR0 Chip	OK	54 degrees C / 129 degrees F
FPC 4 XQ_XR1 TSen	OK	39 degrees C / 102 degrees F
FPC 4 XQ_XR1 Chip	OK	53 degrees C / 127 degrees F
FPC 4 XM 0 TSen	OK	45 degrees C / 113 degrees F
FPC 4 XM 0 Chip	OK	59 degrees C / 138 degrees F
FPC 4 XM 1 TSen	OK	45 degrees C / 113 degrees F
FPC 4 XM 1 Chip	OK	41 degrees C / 105 degrees F

FPC 4 PLX PCIe Switch TSe	OK	45 degrees C / 113 degrees F
FPC 4 PLX PCIe Switch Chi	OK	58 degrees C / 136 degrees F
FPC 5 Intake	OK	29 degrees C / 84 degrees F
FPC 5 Exhaust A	OK	33 degrees C / 91 degrees F
FPC 5 Exhaust B	OK	39 degrees C / 102 degrees F
FPC 5 LU 0 TSen	OK	40 degrees C / 104 degrees F
FPC 5 LU 0 Chip	OK	40 degrees C / 104 degrees F
FPC 5 LU 1 TSen	OK	40 degrees C / 104 degrees F
FPC 5 LU 1 Chip	OK	45 degrees C / 113 degrees F
FPC 5 LU 2 TSen	OK	40 degrees C / 104 degrees F
FPC 5 LU 2 Chip	OK	40 degrees C / 104 degrees F
FPC 5 LU 3 TSen	OK	40 degrees C / 104 degrees F
FPC 5 LU 3 Chip	OK	46 degrees C / 114 degrees F
FPC 5 MQ 0 TSen	OK	32 degrees C / 89 degrees F
FPC 5 MQ 0 Chip	OK	33 degrees C / 91 degrees F
FPC 5 MQ 1 TSen	OK	32 degrees C / 89 degrees F
FPC 5 MQ 1 Chip	OK	35 degrees C / 95 degrees F
FPC 5 MQ 2 TSen	OK	32 degrees C / 89 degrees F
FPC 5 MQ 2 Chip	OK	32 degrees C / 89 degrees F
FPC 5 MQ 3 TSen	OK	32 degrees C / 89 degrees F
FPC 5 MQ 3 Chip	OK	32 degrees C / 89 degrees F
FPC 9 Intake	OK	25 degrees C / 77 degrees F
FPC 9 Exhaust A	OK	37 degrees C / 98 degrees F
FPC 9 Exhaust B	OK	40 degrees C / 104 degrees F
FPC 9 XL 0 TSen	OK	40 degrees C / 104 degrees F
...		

### show chassis environment (MX2010 Router)

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user@host> show chassis environment
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Class	Item	Status	Measurement
Temp	PSM 0	OK	7 degrees C / 44 degrees F
	PSM 1	OK	7 degrees C / 44 degrees F
	PSM 2	OK	7 degrees C / 44 degrees F
	PSM 3	OK	6 degrees C / 42 degrees F
	PSM 4	OK	6 degrees C / 42 degrees F
	PSM 5	OK	6 degrees C / 42 degrees F
	PSM 6	OK	6 degrees C / 42 degrees F
	PSM 7	OK	7 degrees C / 44 degrees F
	PSM 8	OK	7 degrees C / 44 degrees F
	PDM 0	OK	
	PDM 1	Absent	
	CB 0 IntakeA-Zone0	OK	14 degrees C / 57 degrees F
	CB 0 IntakeB-Zone1	OK	7 degrees C / 44 degrees F
	CB 0 IntakeC-Zone0	OK	22 degrees C / 71 degrees F
	CB 0 ExhaustA-Zone0	OK	14 degrees C / 57 degrees F
	CB 0 ExhaustB-Zone1	OK	9 degrees C / 48 degrees F
	CB 0 TCBC-Zone0	OK	11 degrees C / 51 degrees F
	CB 1 IntakeA-Zone0	OK	9 degrees C / 48 degrees F
	CB 1 IntakeB-Zone1	OK	5 degrees C / 41 degrees F
	CB 1 IntakeC-Zone0	OK	20 degrees C / 68 degrees F
	CB 1 ExhaustA-Zone0	OK	12 degrees C / 53 degrees F
	CB 1 ExhaustB-Zone1	OK	7 degrees C / 44 degrees F
	CB 1 TCBC-Zone0	OK	10 degrees C / 50 degrees F
	SPMB 0 Intake	OK	5 degrees C / 41 degrees F
	SPMB 1 Intake	OK	4 degrees C / 39 degrees F
	Routing Engine 0	OK	9 degrees C / 48 degrees F
	Routing Engine 0 CPU	OK	9 degrees C / 48 degrees F
	Routing Engine 1	OK	6 degrees C / 42 degrees F

Routing Engine 1 CPU	OK	6 degrees C / 42 degrees F
SFB 0 Intake-Zone0	OK	26 degrees C / 78 degrees F
SFB 0 Exhaust-Zone1	OK	17 degrees C / 62 degrees F
SFB 0 IntakeA-Zone0	OK	16 degrees C / 60 degrees F
SFB 0 IntakeB-Zone1	OK	11 degrees C / 51 degrees F
SFB 0 Exhaust-Zone0	OK	18 degrees C / 64 degrees F
SFB 0 SFB-XF2-Zone1	OK	25 degrees C / 77 degrees F
SFB 0 SFB-XF1-Zone0	OK	23 degrees C / 73 degrees F
SFB 0 SFB-XF0-Zone0	OK	33 degrees C / 91 degrees F
SFB 1 Intake-Zone0	OK	27 degrees C / 80 degrees F
SFB 1 Exhaust-Zone1	OK	15 degrees C / 59 degrees F
SFB 1 IntakeA-Zone0	OK	20 degrees C / 68 degrees F
SFB 1 IntakeB-Zone1	OK	10 degrees C / 50 degrees F
SFB 1 Exhaust-Zone0	OK	19 degrees C / 66 degrees F
SFB 1 SFB-XF2-Zone1	OK	26 degrees C / 78 degrees F
SFB 1 SFB-XF1-Zone0	OK	27 degrees C / 80 degrees F
SFB 1 SFB-XF0-Zone0	OK	32 degrees C / 89 degrees F
SFB 2 Intake-Zone0	OK	21 degrees C / 69 degrees F
SFB 2 Exhaust-Zone1	OK	13 degrees C / 55 degrees F
SFB 2 IntakeA-Zone0	OK	18 degrees C / 64 degrees F
SFB 2 IntakeB-Zone1	OK	9 degrees C / 48 degrees F
SFB 2 Exhaust-Zone0	OK	16 degrees C / 60 degrees F
SFB 2 SFB-XF2-Zone1	OK	24 degrees C / 75 degrees F
SFB 2 SFB-XF1-Zone0	OK	21 degrees C / 69 degrees F
SFB 2 SFB-XF0-Zone0	OK	26 degrees C / 78 degrees F
SFB 4 Intake-Zone0	OK	28 degrees C / 82 degrees F
SFB 4 Exhaust-Zone1	OK	16 degrees C / 60 degrees F
SFB 4 IntakeA-Zone0	OK	18 degrees C / 64 degrees F
SFB 4 IntakeB-Zone1	OK	11 degrees C / 51 degrees F
SFB 4 Exhaust-Zone0	OK	19 degrees C / 66 degrees F
SFB 4 SFB-XF2-Zone1	OK	27 degrees C / 80 degrees F
SFB 4 SFB-XF1-Zone0	OK	27 degrees C / 80 degrees F
SFB 4 SFB-XF0-Zone0	OK	32 degrees C / 89 degrees F
SFB 5 Intake-Zone0	OK	22 degrees C / 71 degrees F
SFB 5 Exhaust-Zone1	OK	14 degrees C / 57 degrees F
SFB 5 IntakeA-Zone0	OK	18 degrees C / 64 degrees F
SFB 5 IntakeB-Zone1	OK	10 degrees C / 50 degrees F
SFB 5 Exhaust-Zone0	OK	17 degrees C / 62 degrees F
SFB 5 SFB-XF2-Zone1	OK	22 degrees C / 71 degrees F
SFB 5 SFB-XF1-Zone0	OK	29 degrees C / 84 degrees F
SFB 5 SFB-XF0-Zone0	OK	27 degrees C / 80 degrees F
SFB 6 Intake-Zone0	OK	27 degrees C / 80 degrees F
SFB 6 Exhaust-Zone1	OK	13 degrees C / 55 degrees F
SFB 6 IntakeA-Zone0	OK	19 degrees C / 66 degrees F
SFB 6 IntakeB-Zone1	OK	10 degrees C / 50 degrees F
SFB 6 Exhaust-Zone0	OK	20 degrees C / 68 degrees F
SFB 6 SFB-XF2-Zone1	OK	24 degrees C / 75 degrees F
SFB 6 SFB-XF1-Zone0	OK	32 degrees C / 89 degrees F
SFB 6 SFB-XF0-Zone0	OK	33 degrees C / 91 degrees F
SFB 7 Intake-Zone0	OK	25 degrees C / 77 degrees F
SFB 7 Exhaust-Zone1	OK	13 degrees C / 55 degrees F
SFB 7 IntakeA-Zone0	OK	14 degrees C / 57 degrees F
SFB 7 IntakeB-Zone1	OK	8 degrees C / 46 degrees F
SFB 7 Exhaust-Zone0	OK	17 degrees C / 62 degrees F
SFB 7 SFB-XF2-Zone1	OK	21 degrees C / 69 degrees F
SFB 7 SFB-XF1-Zone0	OK	21 degrees C / 69 degrees F
SFB 7 SFB-XF0-Zone0	OK	33 degrees C / 91 degrees F
FPC 0 Intake	OK	13 degrees C / 55 degrees F
FPC 0 Exhaust A	OK	13 degrees C / 55 degrees F
FPC 0 Exhaust B	OK	14 degrees C / 57 degrees F

FPC 0 LU 0 TSen	OK	28 degrees C / 82 degrees F
FPC 0 LU 0 Chip	OK	25 degrees C / 77 degrees F
FPC 0 LU 1 TSen	OK	28 degrees C / 82 degrees F
FPC 0 LU 1 Chip	OK	27 degrees C / 80 degrees F
FPC 0 LU 2 TSen	OK	28 degrees C / 82 degrees F
FPC 0 LU 2 Chip	OK	19 degrees C / 66 degrees F
FPC 0 LU 3 TSen	OK	28 degrees C / 82 degrees F
FPC 0 LU 3 Chip	OK	23 degrees C / 73 degrees F
FPC 0 XM 0 TSen	OK	28 degrees C / 82 degrees F
FPC 0 XM 0 Chip	OK	33 degrees C / 91 degrees F
FPC 0 XM 1 TSen	OK	28 degrees C / 82 degrees F
FPC 0 XM 1 Chip	OK	26 degrees C / 78 degrees F
FPC 0 PLX Switch TSen	OK	28 degrees C / 82 degrees F
FPC 0 PLX Switch Chip	OK	26 degrees C / 78 degrees F
FPC 1 Intake	OK	10 degrees C / 50 degrees F
FPC 1 Exhaust A	OK	24 degrees C / 75 degrees F
FPC 1 Exhaust B	OK	28 degrees C / 82 degrees F
FPC 1 LU 0 TSen	OK	22 degrees C / 71 degrees F
FPC 1 LU 0 Chip	OK	31 degrees C / 87 degrees F
FPC 1 LU 1 TSen	OK	22 degrees C / 71 degrees F
FPC 1 LU 1 Chip	OK	21 degrees C / 69 degrees F
FPC 1 LU 2 TSen	OK	22 degrees C / 71 degrees F
FPC 1 LU 2 Chip	OK	25 degrees C / 77 degrees F
FPC 1 LU 3 TSen	OK	22 degrees C / 71 degrees F
FPC 1 LU 3 Chip	OK	33 degrees C / 91 degrees F
FPC 1 XM 0 TSen	OK	22 degrees C / 71 degrees F
FPC 1 XM 0 Chip	OK	30 degrees C / 86 degrees F
FPC 1 XF 0 TSen	OK	22 degrees C / 71 degrees F
FPC 1 XF 0 Chip	OK	37 degrees C / 98 degrees F
FPC 1 PLX Switch TSen	OK	22 degrees C / 71 degrees F
FPC 1 PLX Switch Chip	OK	22 degrees C / 71 degrees F
FPC 2 Intake	OK	9 degrees C / 48 degrees F
FPC 2 Exhaust A	OK	10 degrees C / 50 degrees F
FPC 2 Exhaust B	OK	10 degrees C / 50 degrees F
FPC 2 LU 0 TSen	OK	26 degrees C / 78 degrees F
FPC 2 LU 0 Chip	OK	25 degrees C / 77 degrees F
FPC 2 LU 1 TSen	OK	26 degrees C / 78 degrees F
FPC 2 LU 1 Chip	OK	26 degrees C / 78 degrees F
FPC 2 LU 2 TSen	OK	26 degrees C / 78 degrees F
FPC 2 LU 2 Chip	OK	17 degrees C / 62 degrees F
FPC 2 LU 3 TSen	OK	26 degrees C / 78 degrees F
FPC 2 LU 3 Chip	OK	22 degrees C / 71 degrees F
FPC 2 XM 0 TSen	OK	26 degrees C / 78 degrees F
FPC 2 XM 0 Chip	OK	34 degrees C / 93 degrees F
FPC 2 XM 1 TSen	OK	26 degrees C / 78 degrees F
FPC 2 XM 1 Chip	OK	26 degrees C / 78 degrees F
FPC 2 PLX Switch TSen	OK	26 degrees C / 78 degrees F
FPC 2 PLX Switch Chip	OK	20 degrees C / 68 degrees F
FPC 3 Intake	OK	12 degrees C / 53 degrees F
FPC 3 Exhaust A	OK	16 degrees C / 60 degrees F
FPC 3 Exhaust B	OK	26 degrees C / 78 degrees F
FPC 3 LU 0 TSen	OK	23 degrees C / 73 degrees F
FPC 3 LU 0 Chip	OK	26 degrees C / 78 degrees F
FPC 3 LU 1 TSen	OK	23 degrees C / 73 degrees F
FPC 3 LU 1 Chip	OK	27 degrees C / 80 degrees F
FPC 3 LU 2 TSen	OK	23 degrees C / 73 degrees F
FPC 3 LU 2 Chip	OK	22 degrees C / 71 degrees F
FPC 3 LU 3 TSen	OK	23 degrees C / 73 degrees F
FPC 3 LU 3 Chip	OK	21 degrees C / 69 degrees F
FPC 3 MQ 0 TSen	OK	15 degrees C / 59 degrees F

FPC 3 MQ 0 Chip	OK	18 degrees C / 64 degrees F
FPC 3 MQ 1 TSen	OK	15 degrees C / 59 degrees F
FPC 3 MQ 1 Chip	OK	20 degrees C / 68 degrees F
FPC 3 MQ 2 TSen	OK	15 degrees C / 59 degrees F
FPC 3 MQ 2 Chip	OK	17 degrees C / 62 degrees F
FPC 3 MQ 3 TSen	OK	15 degrees C / 59 degrees F
FPC 3 MQ 3 Chip	OK	16 degrees C / 60 degrees F
FPC 4 Intake	OK	11 degrees C / 51 degrees F
FPC 4 Exhaust A	OK	22 degrees C / 71 degrees F
FPC 4 Exhaust B	OK	28 degrees C / 82 degrees F
FPC 4 LU 0 TSen	OK	22 degrees C / 71 degrees F
FPC 4 LU 0 Chip	OK	33 degrees C / 91 degrees F
FPC 4 LU 1 TSen	OK	22 degrees C / 71 degrees F
FPC 4 LU 1 Chip	OK	21 degrees C / 69 degrees F
FPC 4 LU 2 TSen	OK	22 degrees C / 71 degrees F
FPC 4 LU 2 Chip	OK	26 degrees C / 78 degrees F
FPC 4 LU 3 TSen	OK	22 degrees C / 71 degrees F
FPC 4 LU 3 Chip	OK	33 degrees C / 91 degrees F
FPC 4 XM 0 TSen	OK	22 degrees C / 71 degrees F
FPC 4 XM 0 Chip	OK	30 degrees C / 86 degrees F
FPC 4 XF 0 TSen	OK	22 degrees C / 71 degrees F
FPC 4 XF 0 Chip	OK	37 degrees C / 98 degrees F
FPC 4 PLX Switch TSen	OK	22 degrees C / 71 degrees F
FPC 4 PLX Switch Chip	OK	23 degrees C / 73 degrees F
FPC 5 Intake	OK	12 degrees C / 53 degrees F
FPC 5 Exhaust A	OK	12 degrees C / 53 degrees F
FPC 5 Exhaust B	OK	12 degrees C / 53 degrees F
FPC 5 LU 0 TSen	OK	27 degrees C / 80 degrees F
FPC 5 LU 0 Chip	OK	28 degrees C / 82 degrees F
FPC 5 LU 1 TSen	OK	27 degrees C / 80 degrees F
FPC 5 LU 1 Chip	OK	27 degrees C / 80 degrees F
FPC 5 LU 2 TSen	OK	27 degrees C / 80 degrees F
FPC 5 LU 2 Chip	OK	19 degrees C / 66 degrees F
FPC 5 LU 3 TSen	OK	27 degrees C / 80 degrees F
FPC 5 LU 3 Chip	OK	22 degrees C / 71 degrees F
FPC 5 XM 0 TSen	OK	27 degrees C / 80 degrees F
FPC 5 XM 0 Chip	OK	36 degrees C / 96 degrees F
FPC 5 XM 1 TSen	OK	27 degrees C / 80 degrees F
FPC 5 XM 1 Chip	OK	26 degrees C / 78 degrees F
FPC 5 PLX Switch TSen	OK	27 degrees C / 80 degrees F
FPC 5 PLX Switch Chip	OK	24 degrees C / 75 degrees F
FPC 6 Intake	OK	12 degrees C / 53 degrees F
FPC 6 Exhaust A	OK	17 degrees C / 62 degrees F
FPC 6 Exhaust B	OK	28 degrees C / 82 degrees F
FPC 6 LU 0 TSen	OK	24 degrees C / 75 degrees F
FPC 6 LU 0 Chip	OK	29 degrees C / 84 degrees F
FPC 6 LU 1 TSen	OK	24 degrees C / 75 degrees F
FPC 6 LU 1 Chip	OK	30 degrees C / 86 degrees F
FPC 6 LU 2 TSen	OK	24 degrees C / 75 degrees F
FPC 6 LU 2 Chip	OK	24 degrees C / 75 degrees F
FPC 6 LU 3 TSen	OK	24 degrees C / 75 degrees F
FPC 6 LU 3 Chip	OK	22 degrees C / 71 degrees F
FPC 6 MQ 0 TSen	OK	16 degrees C / 60 degrees F
FPC 6 MQ 0 Chip	OK	19 degrees C / 66 degrees F
FPC 6 MQ 1 TSen	OK	16 degrees C / 60 degrees F
FPC 6 MQ 1 Chip	OK	20 degrees C / 68 degrees F
FPC 6 MQ 2 TSen	OK	16 degrees C / 60 degrees F
FPC 6 MQ 2 Chip	OK	17 degrees C / 62 degrees F
FPC 6 MQ 3 TSen	OK	16 degrees C / 60 degrees F
FPC 6 MQ 3 Chip	OK	16 degrees C / 60 degrees F

FPC 7 Intake	OK	10 degrees C / 50 degrees F
FPC 7 Exhaust A	OK	10 degrees C / 50 degrees F
FPC 7 Exhaust B	OK	11 degrees C / 51 degrees F
FPC 7 LU 0 TSen	OK	26 degrees C / 78 degrees F
FPC 7 LU 0 Chip	OK	26 degrees C / 78 degrees F
FPC 7 LU 1 TSen	OK	26 degrees C / 78 degrees F
FPC 7 LU 1 Chip	OK	29 degrees C / 84 degrees F
FPC 7 LU 2 TSen	OK	26 degrees C / 78 degrees F
FPC 7 LU 2 Chip	OK	19 degrees C / 66 degrees F
FPC 7 LU 3 TSen	OK	26 degrees C / 78 degrees F
FPC 7 LU 3 Chip	OK	24 degrees C / 75 degrees F
FPC 7 XM 0 TSen	OK	26 degrees C / 78 degrees F
FPC 7 XM 0 Chip	OK	34 degrees C / 93 degrees F
FPC 7 XM 1 TSen	OK	26 degrees C / 78 degrees F
FPC 7 XM 1 Chip	OK	32 degrees C / 89 degrees F
FPC 7 PLX Switch TSen	OK	26 degrees C / 78 degrees F
FPC 7 PLX Switch Chip	OK	22 degrees C / 71 degrees F
FPC 8 Intake	OK	10 degrees C / 50 degrees F
FPC 8 Exhaust A	OK	22 degrees C / 71 degrees F
FPC 8 Exhaust B	OK	28 degrees C / 82 degrees F
FPC 8 LU 0 TSen	OK	20 degrees C / 68 degrees F
FPC 8 LU 0 Chip	OK	33 degrees C / 91 degrees F
FPC 8 LU 1 TSen	OK	20 degrees C / 68 degrees F
FPC 8 LU 1 Chip	OK	23 degrees C / 73 degrees F
FPC 8 LU 2 TSen	OK	20 degrees C / 68 degrees F
FPC 8 LU 2 Chip	OK	26 degrees C / 78 degrees F
FPC 8 LU 3 TSen	OK	20 degrees C / 68 degrees F
FPC 8 LU 3 Chip	OK	33 degrees C / 91 degrees F
FPC 8 XM 0 TSen	OK	20 degrees C / 68 degrees F
FPC 8 XM 0 Chip	OK	29 degrees C / 84 degrees F
FPC 8 XF 0 TSen	OK	20 degrees C / 68 degrees F
FPC 8 XF 0 Chip	OK	38 degrees C / 100 degrees F
FPC 8 PLX Switch TSen	OK	20 degrees C / 68 degrees F
FPC 8 PLX Switch Chip	OK	24 degrees C / 75 degrees F
FPC 9 Intake	OK	11 degrees C / 51 degrees F
FPC 9 Exhaust A	OK	11 degrees C / 51 degrees F
FPC 9 Exhaust B	OK	11 degrees C / 51 degrees F
FPC 9 LU 0 TSen	OK	25 degrees C / 77 degrees F
FPC 9 LU 0 Chip	OK	24 degrees C / 75 degrees F
FPC 9 LU 1 TSen	OK	25 degrees C / 77 degrees F
FPC 9 LU 1 Chip	OK	26 degrees C / 78 degrees F
FPC 9 LU 2 TSen	OK	25 degrees C / 77 degrees F
FPC 9 LU 2 Chip	OK	16 degrees C / 60 degrees F
FPC 9 LU 3 TSen	OK	25 degrees C / 77 degrees F
FPC 9 LU 3 Chip	OK	21 degrees C / 69 degrees F
FPC 9 XM 0 TSen	OK	25 degrees C / 77 degrees F
FPC 9 XM 0 Chip	OK	32 degrees C / 89 degrees F
FPC 9 XM 1 TSen	OK	25 degrees C / 77 degrees F
FPC 9 XM 1 Chip	OK	25 degrees C / 77 degrees F
FPC 9 PLX Switch TSen	OK	25 degrees C / 77 degrees F
FPC 9 PLX Switch Chip	OK	21 degrees C / 69 degrees F
ADC 0 Intake	OK	12 degrees C / 53 degrees F
ADC 0 Exhaust	OK	20 degrees C / 68 degrees F
ADC 0 ADC-XF1	OK	26 degrees C / 78 degrees F
ADC 0 ADC-XF0	OK	32 degrees C / 89 degrees F
ADC 1 Intake	OK	11 degrees C / 51 degrees F
ADC 1 Exhaust	OK	21 degrees C / 69 degrees F
ADC 1 ADC-XF1	OK	24 degrees C / 75 degrees F
ADC 1 ADC-XF0	OK	31 degrees C / 87 degrees F
ADC 2 Intake	OK	14 degrees C / 57 degrees F



ADC 2 Exhaust	OK	21 degrees C / 69 degrees F
ADC 2 ADC-XF1	OK	28 degrees C / 82 degrees F
ADC 2 ADC-XF0	OK	34 degrees C / 93 degrees F
ADC 3 Intake	OK	13 degrees C / 55 degrees F
ADC 3 Exhaust	OK	19 degrees C / 66 degrees F
ADC 3 ADC-XF1	OK	24 degrees C / 75 degrees F
ADC 3 ADC-XF0	OK	31 degrees C / 87 degrees F
ADC 4 Intake	OK	9 degrees C / 48 degrees F
ADC 4 Exhaust	OK	22 degrees C / 71 degrees F
ADC 4 ADC-XF1	OK	28 degrees C / 82 degrees F
ADC 4 ADC-XF0	OK	35 degrees C / 95 degrees F
ADC 5 Intake	OK	12 degrees C / 53 degrees F
ADC 5 Exhaust	OK	22 degrees C / 71 degrees F
ADC 5 ADC-XF1	OK	28 degrees C / 82 degrees F
ADC 5 ADC-XF0	OK	34 degrees C / 93 degrees F
ADC 6 Intake	OK	11 degrees C / 51 degrees F
ADC 6 Exhaust	OK	21 degrees C / 69 degrees F
ADC 6 ADC-XF1	OK	26 degrees C / 78 degrees F
ADC 6 ADC-XF0	OK	35 degrees C / 95 degrees F
ADC 7 Intake	OK	14 degrees C / 57 degrees F
ADC 7 Exhaust	OK	22 degrees C / 71 degrees F
ADC 7 ADC-XF1	OK	26 degrees C / 78 degrees F
ADC 7 ADC-XF0	OK	34 degrees C / 93 degrees F
ADC 8 Intake	OK	14 degrees C / 57 degrees F
ADC 8 Exhaust	OK	21 degrees C / 69 degrees F
ADC 8 ADC-XF1	OK	24 degrees C / 75 degrees F
ADC 8 ADC-XF0	OK	31 degrees C / 87 degrees F
ADC 9 Intake	OK	10 degrees C / 50 degrees F
ADC 9 Exhaust	OK	22 degrees C / 71 degrees F
ADC 9 ADC-XF1	OK	28 degrees C / 82 degrees F
ADC 9 ADC-XF0	OK	36 degrees C / 96 degrees F
Fans Fan Tray 0 Fan 1	OK	3480 RPM
Fans Fan Tray 0 Fan 2	OK	3480 RPM
Fans Fan Tray 0 Fan 3	OK	3480 RPM
Fans Fan Tray 0 Fan 4	OK	3360 RPM
Fans Fan Tray 0 Fan 5	OK	3360 RPM
Fans Fan Tray 0 Fan 6	OK	3480 RPM
Fans Fan Tray 1 Fan 1	OK	3360 RPM
Fans Fan Tray 1 Fan 2	OK	3360 RPM
Fans Fan Tray 1 Fan 3	OK	3360 RPM
Fans Fan Tray 1 Fan 4	OK	3480 RPM
Fans Fan Tray 1 Fan 5	OK	3480 RPM
Fans Fan Tray 1 Fan 6	OK	3480 RPM
Fans Fan Tray 2 Fan 1	OK	3360 RPM
Fans Fan Tray 2 Fan 2	OK	3360 RPM
Fans Fan Tray 2 Fan 3	OK	3480 RPM
Fans Fan Tray 2 Fan 4	OK	3480 RPM
Fans Fan Tray 2 Fan 5	OK	3360 RPM
Fans Fan Tray 2 Fan 6	OK	3480 RPM
Fans Fan Tray 3 Fan 1	OK	3360 RPM
Fans Fan Tray 3 Fan 2	OK	3360 RPM
Fans Fan Tray 3 Fan 3	OK	3480 RPM
Fans Fan Tray 3 Fan 4	OK	3480 RPM
Fans Fan Tray 3 Fan 5	OK	3480 RPM
Fans Fan Tray 3 Fan 6	OK	3360 RPM

**show chassis environment (MX2008 Router)**

```
user@host>show chassis environment
```

Class	Item	Status	Measurement
Temp	PSM 0	Absent	
	PSM 1	OK	29 degrees C / 84 degrees F
	PSM 2	OK	30 degrees C / 86 degrees F
	PSM 3	OK	29 degrees C / 84 degrees F
	PSM 4	OK	29 degrees C / 84 degrees F
	PSM 5	OK	30 degrees C / 86 degrees F
	PSM 6	OK	29 degrees C / 84 degrees F
	PSM 7	OK	31 degrees C / 87 degrees F
	PSM 8	Absent	
	PDM 0	OK	
	PDM 1	OK	
	CB 0 Inlet1	OK	37 degrees C / 98 degrees F
	CB 0 Inlet2	OK	45 degrees C / 113 degrees F
	CB 0 Inlet3	OK	44 degrees C / 111 degrees F
	CB 0 Inlet4	OK	41 degrees C / 105 degrees F
	CB 0 Exhaust1	OK	30 degrees C / 86 degrees F
	CB 0 Exhaust2	OK	40 degrees C / 104 degrees F
	CB 0 Exhaust3	OK	48 degrees C / 118 degrees F
	CB 0 Exhaust4	OK	46 degrees C / 114 degrees F
	CB 1 Inlet1	OK	30 degrees C / 86 degrees F
	CB 1 Inlet2	OK	31 degrees C / 87 degrees F
	CB 1 Inlet3	OK	29 degrees C / 84 degrees F
	CB 1 Inlet4	OK	32 degrees C / 89 degrees F
	CB 1 Exhaust1	OK	30 degrees C / 86 degrees F
	CB 1 Exhaust2	OK	33 degrees C / 91 degrees F
	CB 1 Exhaust3	OK	34 degrees C / 93 degrees F
	CB 1 Exhaust4	OK	34 degrees C / 93 degrees F
	Routing Engine 0	OK	
	Routing Engine 0 CPU	OK	75 degrees C / 167 degrees F
	Routing Engine 1	OK	
	Routing Engine 1 CPU	OK	46 degrees C / 114 degrees F
	SFB 0 Inlet2	OK	44 degrees C / 111 degrees F
	SFB 0 Exhaust1	OK	39 degrees C / 102 degrees F
	SFB 0 Inlet1	OK	41 degrees C / 105 degrees F
	SFB 0 Exhaust2	OK	45 degrees C / 113 degrees F
	SFB 0 SFB2-PF-local	OK	45 degrees C / 113 degrees F
	SFB 0 SFB2-PF-die	OK	51 degrees C / 123 degrees F
	SFB 1 Inlet2	OK	30 degrees C / 86 degrees F
	SFB 1 Exhaust1	OK	27 degrees C / 80 degrees F
	SFB 1 Inlet1	OK	28 degrees C / 82 degrees F
	SFB 1 Exhaust2	OK	31 degrees C / 87 degrees F
	SFB 1 SFB2-PF-local	OK	30 degrees C / 86 degrees F
	SFB 1 SFB2-PF-die	OK	37 degrees C / 98 degrees F
	SFB 2 Inlet2	OK	28 degrees C / 82 degrees F
	SFB 2 Exhaust1	OK	26 degrees C / 78 degrees F
	SFB 2 Inlet1	OK	27 degrees C / 80 degrees F
	SFB 2 Exhaust2	OK	28 degrees C / 82 degrees F
	SFB 2 SFB2-PF-local	OK	27 degrees C / 80 degrees F
	SFB 2 SFB2-PF-die	OK	33 degrees C / 91 degrees F
	SFB 3 Inlet2	OK	28 degrees C / 82 degrees F
	SFB 3 Exhaust1	OK	26 degrees C / 78 degrees F
	SFB 3 Inlet1	OK	26 degrees C / 78 degrees F
	SFB 3 Exhaust2	OK	28 degrees C / 82 degrees F
	SFB 3 SFB2-PF-local	OK	27 degrees C / 80 degrees F
	SFB 3 SFB2-PF-die	OK	33 degrees C / 91 degrees F
	SFB 4 Inlet2	OK	28 degrees C / 82 degrees F
	SFB 4 Exhaust1	OK	26 degrees C / 78 degrees F
	SFB 4 Inlet1	OK	26 degrees C / 78 degrees F
	SFB 4 Exhaust2	OK	28 degrees C / 82 degrees F

SFB 4 SFB2-PF-local	OK	27 degrees C / 80 degrees F
SFB 4 SFB2-PF-die	OK	32 degrees C / 89 degrees F
SFB 5 Inlet2	OK	29 degrees C / 84 degrees F
SFB 5 Exhaust1	OK	27 degrees C / 80 degrees F
SFB 5 Inlet1	OK	28 degrees C / 82 degrees F
SFB 5 Exhaust2	OK	29 degrees C / 84 degrees F
SFB 5 SFB2-PF-local	OK	28 degrees C / 82 degrees F
SFB 5 SFB2-PF-die	OK	34 degrees C / 93 degrees F
SFB 6 Inlet2	OK	33 degrees C / 91 degrees F
SFB 6 Exhaust1	OK	32 degrees C / 89 degrees F
SFB 6 Inlet1	OK	32 degrees C / 89 degrees F
SFB 6 Exhaust2	OK	34 degrees C / 93 degrees F
SFB 6 SFB2-PF-local	OK	33 degrees C / 91 degrees F
SFB 6 SFB2-PF-die	OK	40 degrees C / 104 degrees F
SFB 7 Inlet2	OK	29 degrees C / 84 degrees F
SFB 7 Exhaust1	OK	28 degrees C / 82 degrees F
SFB 7 Inlet1	OK	29 degrees C / 84 degrees F
SFB 7 Exhaust2	OK	29 degrees C / 84 degrees F
SFB 7 SFB2-PF-local	OK	28 degrees C / 82 degrees F
SFB 7 SFB2-PF-die	OK	33 degrees C / 91 degrees F
FPC 0 Intake	OK	29 degrees C / 84 degrees F
FPC 0 Exhaust A	OK	42 degrees C / 107 degrees F
FPC 0 Exhaust B	OK	42 degrees C / 107 degrees F
FPC 0 XL 0 TSen	OK	38 degrees C / 100 degrees F
FPC 0 XL 0 Chip	OK	53 degrees C / 127 degrees F
FPC 0 XL 0 XR2 0 TSen	OK	38 degrees C / 100 degrees F
FPC 0 XL 0 XR2 0 Chip	OK	59 degrees C / 138 degrees F
FPC 0 XL 0 XR2 1 TSen	OK	38 degrees C / 100 degrees F
FPC 0 XL 0 XR2 1 Chip	OK	59 degrees C / 138 degrees F
FPC 0 XL 1 TSen	OK	30 degrees C / 86 degrees F
FPC 0 XL 1 Chip	OK	42 degrees C / 107 degrees F
FPC 0 XL 1 XR2 0 TSen	OK	30 degrees C / 86 degrees F
FPC 0 XL 1 XR2 0 Chip	OK	49 degrees C / 120 degrees F
FPC 0 XL 1 XR2 1 TSen	OK	30 degrees C / 86 degrees F
FPC 0 XL 1 XR2 1 Chip	OK	50 degrees C / 122 degrees F
FPC 0 XM 0 TSen	OK	42 degrees C / 107 degrees F
FPC 0 XM 0 Chip	OK	49 degrees C / 120 degrees F
FPC 0 XM 1 TSen	OK	42 degrees C / 107 degrees F
FPC 0 XM 1 Chip	OK	42 degrees C / 107 degrees F
FPC 0 XM 2 TSen	OK	42 degrees C / 107 degrees F
FPC 0 XM 2 Chip	OK	42 degrees C / 107 degrees F
FPC 0 XM 3 TSen	OK	42 degrees C / 107 degrees F
FPC 0 XM 3 Chip	OK	40 degrees C / 104 degrees F
FPC 0 PCIe Switch TSen	OK	42 degrees C / 107 degrees F
FPC 0 PCIe Switch Chip	OK	22 degrees C / 71 degrees F
FPC 1 Intake	OK	29 degrees C / 84 degrees F
FPC 1 Exhaust A	OK	52 degrees C / 125 degrees F
FPC 1 Exhaust B	OK	44 degrees C / 111 degrees F
FPC 1 EA0 TSen	OK	54 degrees C / 129 degrees F
FPC 1 EA0 Chip	OK	47 degrees C / 116 degrees F
FPC 1 EA0_XR0 TSen	OK	54 degrees C / 129 degrees F
FPC 1 EA0_XR0 Chip	OK	56 degrees C / 132 degrees F
FPC 1 EA0_XR1 TSen	OK	54 degrees C / 129 degrees F
FPC 1 EA0_XR1 Chip	OK	53 degrees C / 127 degrees F
FPC 1 EA1 TSen	OK	54 degrees C / 129 degrees F
FPC 1 EA1 Chip	OK	49 degrees C / 120 degrees F
FPC 1 EA1_XR0 TSen	OK	54 degrees C / 129 degrees F
FPC 1 EA1_XR0 Chip	OK	57 degrees C / 134 degrees F
FPC 1 EA1_XR1 TSen	OK	54 degrees C / 129 degrees F
FPC 1 EA1_XR1 Chip	OK	58 degrees C / 136 degrees F

FPC 1 PEX TSen	OK	54 degrees C / 129 degrees F
FPC 1 PEX Chip	OK	39 degrees C / 102 degrees F
FPC 1 EA2 TSen	OK	43 degrees C / 109 degrees F
FPC 1 EA2 Chip	OK	39 degrees C / 102 degrees F
FPC 1 EA2_XR0 TSen	OK	43 degrees C / 109 degrees F
FPC 1 EA2_XR0 Chip	OK	45 degrees C / 113 degrees F
FPC 1 EA2_XR1 TSen	OK	43 degrees C / 109 degrees F
FPC 1 EA2_XR1 Chip	OK	42 degrees C / 107 degrees F
FPC 1 EA3 TSen	OK	43 degrees C / 109 degrees F
FPC 1 EA3 Chip	OK	40 degrees C / 104 degrees F
FPC 1 EA3_XR0 TSen	OK	43 degrees C / 109 degrees F
FPC 1 EA3_XR0 Chip	OK	50 degrees C / 122 degrees F
FPC 1 EA3_XR1 TSen	OK	43 degrees C / 109 degrees F
FPC 1 EA3_XR1 Chip	OK	46 degrees C / 114 degrees F
FPC 1 EA0_HMC0 Logic die	OK	60 degrees C / 140 degrees F
FPC 1 EA0_HMC0 DRAM botm	OK	57 degrees C / 134 degrees F
FPC 1 EA0_HMC1 Logic die	OK	61 degrees C / 141 degrees F
FPC 1 EA0_HMC1 DRAM botm	OK	58 degrees C / 136 degrees F
FPC 1 EA0_HMC2 Logic die	OK	57 degrees C / 134 degrees F
FPC 1 EA0_HMC2 DRAM botm	OK	54 degrees C / 129 degrees F
FPC 1 EA1_HMC0 Logic die	OK	65 degrees C / 149 degrees F
FPC 1 EA1_HMC0 DRAM botm	OK	62 degrees C / 143 degrees F
FPC 1 EA1_HMC1 Logic die	OK	64 degrees C / 147 degrees F
FPC 1 EA1_HMC1 DRAM botm	OK	61 degrees C / 141 degrees F
FPC 1 EA1_HMC2 Logic die	OK	61 degrees C / 141 degrees F
FPC 1 EA1_HMC2 DRAM botm	OK	58 degrees C / 136 degrees F
FPC 1 EA2_HMC0 Logic die	OK	50 degrees C / 122 degrees F
FPC 1 EA2_HMC0 DRAM botm	OK	47 degrees C / 116 degrees F
FPC 1 EA2_HMC1 Logic die	OK	54 degrees C / 129 degrees F
FPC 1 EA2_HMC1 DRAM botm	OK	51 degrees C / 123 degrees F
FPC 1 EA2_HMC2 Logic die	OK	51 degrees C / 123 degrees F
FPC 1 EA2_HMC2 DRAM botm	OK	48 degrees C / 118 degrees F
FPC 1 EA3_HMC0 Logic die	OK	51 degrees C / 123 degrees F
FPC 1 EA3_HMC0 DRAM botm	OK	48 degrees C / 118 degrees F
FPC 1 EA3_HMC1 Logic die	OK	51 degrees C / 123 degrees F
FPC 1 EA3_HMC1 DRAM botm	OK	48 degrees C / 118 degrees F
FPC 1 EA3_HMC2 Logic die	OK	51 degrees C / 123 degrees F
FPC 1 EA3_HMC2 DRAM botm	OK	48 degrees C / 118 degrees F
FPC 7 Intake	OK	30 degrees C / 86 degrees F
FPC 7 Exhaust A	OK	45 degrees C / 113 degrees F
FPC 7 Exhaust B	OK	38 degrees C / 100 degrees F
FPC 7 QX 0 TSen	OK	48 degrees C / 118 degrees F
FPC 7 QX 0 Chip	OK	51 degrees C / 123 degrees F
FPC 7 LU 0 TCAM TSen	OK	48 degrees C / 118 degrees F
FPC 7 LU 0 TCAM Chip	OK	51 degrees C / 123 degrees F
FPC 7 LU 0 TSen	OK	48 degrees C / 118 degrees F
FPC 7 LU 0 Chip	OK	50 degrees C / 122 degrees F
FPC 7 MQ 0 TSen	OK	48 degrees C / 118 degrees F
FPC 7 MQ 0 Chip	OK	54 degrees C / 129 degrees F
FPC 7 QX 1 TSen	OK	41 degrees C / 105 degrees F
FPC 7 QX 1 Chip	OK	42 degrees C / 107 degrees F
FPC 7 LU 1 TCAM TSen	OK	41 degrees C / 105 degrees F
FPC 7 LU 1 TCAM Chip	OK	43 degrees C / 109 degrees F
FPC 7 LU 1 TSen	OK	41 degrees C / 105 degrees F
FPC 7 LU 1 Chip	OK	46 degrees C / 114 degrees F
FPC 7 MQ 1 TSen	OK	41 degrees C / 105 degrees F
FPC 7 MQ 1 Chip	OK	47 degrees C / 116 degrees F
ADC 7 Intake	OK	32 degrees C / 89 degrees F
ADC 7 Exhaust	OK	39 degrees C / 102 degrees F
ADC 7 ADC-XF1	OK	46 degrees C / 114 degrees F

	ADC 7 ADC-XF0	OK	54 degrees C / 129 degrees F
Fans	Fan Tray 0 Fan 1	OK	6240 RPM
	Fan Tray 0 Fan 2	OK	6120 RPM
	Fan Tray 0 Fan 3	OK	6120 RPM
	Fan Tray 0 Fan 4	OK	5760 RPM
	Fan Tray 0 Fan 5	OK	5880 RPM
	Fan Tray 0 Fan 6	OK	6000 RPM
	Fan Tray 1 Fan 1	OK	5880 RPM
	Fan Tray 1 Fan 2	OK	5880 RPM
	Fan Tray 1 Fan 3	OK	6000 RPM
	Fan Tray 1 Fan 4	OK	6000 RPM
	Fan Tray 1 Fan 5	OK	6000 RPM
	Fan Tray 1 Fan 6	OK	6000 RPM

### show chassis environment (T320 Router)

user@host> show chassis environment

Class	Item	Status	Measurement
Power	PEM 0	OK	
	PEM 1	Absent	
Temp	SCG 0	OK	28 degrees C / 82 degrees F
	SCG 1	OK	28 degrees C / 82 degrees F
	Routing Engine 0	OK	31 degrees C / 87 degrees F
	Routing Engine 1	OK	30 degrees C / 86 degrees F
	CB 0	OK	32 degrees C / 89 degrees F
	CB 1	OK	32 degrees C / 89 degrees F
	SIB 0	OK	33 degrees C / 91 degrees F
	SIB 1	OK	33 degrees C / 91 degrees F
	SIB 2	OK	34 degrees C / 93 degrees F
	FPC 0 Top	OK	38 degrees C / 100 degrees F
	FPC 0 Bottom	OK	32 degrees C / 89 degrees F
	FPC 1 Top	OK	38 degrees C / 100 degrees F
	FPC 1 Bottom	OK	33 degrees C / 91 degrees F
	FPC 2 Top	OK	36 degrees C / 96 degrees F
	FPC 2 Bottom	OK	31 degrees C / 87 degrees F
	FPM GBUS	OK	26 degrees C / 78 degrees F
	FPM Display	OK	29 degrees C / 84 degrees F
Fans	Top Left Front fan	OK	Spinning at normal speed
	Top Left Middle fan	OK	Spinning at normal speed
	Top Left Rear fan	OK	Spinning at normal speed
	Top Right Front fan	OK	Spinning at normal speed
	Top Right Middle fan	OK	Spinning at normal speed
	Top Right Rear fan	OK	Spinning at normal speed
	Bottom Left Front fan	OK	Spinning at normal speed
	Bottom Left Middle fan	OK	Spinning at normal speed
	Bottom Left Rear fan	OK	Spinning at normal speed
	Bottom Right Front fan	OK	Spinning at normal speed
	Bottom Right Middle fan	OK	Spinning at normal speed
	Bottom Right Rear fan	OK	Spinning at normal speed
	Rear Tray Top fan	OK	Spinning at normal speed
	Rear Tray Second fan	OK	Spinning at normal speed
	Rear Tray Fourth fan	OK	Spinning at normal speed
	Rear Tray Bottom fan	OK	Spinning at normal speed
Misc	CIP	OK	
	SPMB 0	OK	
	SPMB 1	OK	

## show chassis environment (MX10003 Router)

user@host&gt; show chassis environment

Class	Item	Status	Measurement
Temp	CB 0 Exhaust Temp Sensor 0x49	OK	36 degrees C / 96 degrees F
	CB 0 Inlet Temp Sensor 0x49	OK	29 degrees C / 84 degrees F
	CB 1 Exhaust Temp Sensor 0x49	OK	36 degrees C / 96 degrees F
	CB 1 Inlet Temp Sensor 0x49	OK	31 degrees C / 87 degrees F
	FPC 0 Intake Temp Sensor	OK	29 degrees C / 84 degrees F
	FPC 0 Exhaust-A Temp Sensor	OK	55 degrees C / 131 degrees F
	FPC 0 Exhaust-B Temp Sensor	OK	44 degrees C / 111 degrees F
	FPC 0 EA0 Chip	OK	58 degrees C / 136 degrees F
	FPC 0 EA0-XR0 Chip	OK	61 degrees C / 141 degrees F
	FPC 0 EA0-XR1 Chip	OK	62 degrees C / 143 degrees F
	FPC 0 EA1 Chip	OK	67 degrees C / 152 degrees F
	FPC 0 EA1-XR0 Chip	OK	71 degrees C / 159 degrees F
	FPC 0 EA1-XR1 Chip	OK	72 degrees C / 161 degrees F
	FPC 0 PEX Chip	OK	75 degrees C / 167 degrees F
	FPC 0 EA2 Chip	OK	49 degrees C / 120 degrees F
	FPC 0 EA2-XR0 Chip	OK	55 degrees C / 131 degrees F
	FPC 0 EA2-XR1 Chip	OK	56 degrees C / 132 degrees F
	FPC 0 PF Chip	OK	68 degrees C / 154 degrees F
	FPC 0 EA0_HMC0 Logic die	OK	72 degrees C / 161 degrees F
	FPC 0 EA0_HMC0 DRAM botm	OK	69 degrees C / 156 degrees F
	FPC 0 EA0_HMC1 Logic die	OK	72 degrees C / 161 degrees F
	FPC 0 EA0_HMC1 DRAM botm	OK	69 degrees C / 156 degrees F
	FPC 0 EA0_HMC2 Logic die	OK	75 degrees C / 167 degrees F
	FPC 0 EA0_HMC2 DRAM botm	OK	72 degrees C / 161 degrees F
	FPC 0 EA1_HMC0 Logic die	OK	81 degrees C / 177 degrees F
	FPC 0 EA1_HMC0 DRAM botm	OK	78 degrees C / 172 degrees F
	FPC 0 EA1_HMC1 Logic die	OK	79 degrees C / 174 degrees F
	FPC 0 EA1_HMC1 DRAM botm	OK	76 degrees C / 168 degrees F
	FPC 0 EA1_HMC2 Logic die	OK	82 degrees C / 179 degrees F
	FPC 0 EA1_HMC2 DRAM botm	OK	79 degrees C / 174 degrees F
	FPC 0 EA2_HMC0 Logic die	OK	61 degrees C / 141 degrees F
	FPC 0 EA2_HMC0 DRAM botm	OK	58 degrees C / 136 degrees F
	FPC 0 EA2_HMC1 Logic die	OK	62 degrees C / 143 degrees F
	FPC 0 EA2_HMC1 DRAM botm	OK	59 degrees C / 138 degrees F
	FPC 0 EA2_HMC2 Logic die	OK	64 degrees C / 147 degrees F
	FPC 0 EA2_HMC2 DRAM botm	OK	61 degrees C / 141 degrees F
	FPC 1 Intake Temp Sensor	OK	28 degrees C / 82 degrees F
	FPC 1 Exhaust-A Temp Sensor	OK	58 degrees C / 136 degrees F
	FPC 1 Exhaust-B Temp Sensor	OK	46 degrees C / 114 degrees F
	FPC 1 EA0 Chip	OK	64 degrees C / 147 degrees F
	FPC 1 EA0-XR0 Chip	OK	67 degrees C / 152 degrees F
	FPC 1 EA0-XR1 Chip	OK	68 degrees C / 154 degrees F
	FPC 1 EA1 Chip	OK	70 degrees C / 158 degrees F
	FPC 1 EA1-XR0 Chip	OK	74 degrees C / 165 degrees F
	FPC 1 EA1-XR1 Chip	OK	74 degrees C / 165 degrees F
	FPC 1 PEX Chip	OK	88 degrees C / 190 degrees F
	FPC 1 EA2 Chip	OK	50 degrees C / 122 degrees F
	FPC 1 EA2-XR0 Chip	OK	54 degrees C / 129 degrees F
	FPC 1 EA2-XR1 Chip	OK	56 degrees C / 132 degrees F
	FPC 1 PF Chip	OK	71 degrees C / 159 degrees F
	FPC 1 EA0_HMC0 Logic die	OK	74 degrees C / 165 degrees F
	FPC 1 EA0_HMC0 DRAM botm	OK	71 degrees C / 159 degrees F
	FPC 1 EA0_HMC1 Logic die	OK	78 degrees C / 172 degrees F
	FPC 1 EA0_HMC1 DRAM botm	OK	75 degrees C / 167 degrees F

	FPC 1 EA0_HMC2 Logic die	OK	78 degrees C / 172 degrees F
	FPC 1 EA0_HMC2 DRAM botm	OK	75 degrees C / 167 degrees F
	FPC 1 EA1_HMC0 Logic die	OK	84 degrees C / 183 degrees F
	FPC 1 EA1_HMC0 DRAM botm	OK	81 degrees C / 177 degrees F
	FPC 1 EA1_HMC1 Logic die	OK	81 degrees C / 177 degrees F
	FPC 1 EA1_HMC1 DRAM botm	OK	78 degrees C / 172 degrees F
	FPC 1 EA1_HMC2 Logic die	OK	85 degrees C / 185 degrees F
	FPC 1 EA1_HMC2 DRAM botm	OK	82 degrees C / 179 degrees F
	FPC 1 EA2_HMC0 Logic die	OK	63 degrees C / 145 degrees F
	FPC 1 EA2_HMC0 DRAM botm	OK	60 degrees C / 140 degrees F
	FPC 1 EA2_HMC1 Logic die	OK	60 degrees C / 140 degrees F
	FPC 1 EA2_HMC1 DRAM botm	OK	57 degrees C / 134 degrees F
	FPC 1 EA2_HMC2 Logic die	OK	66 degrees C / 150 degrees F
	FPC 1 EA2_HMC2 DRAM botm	OK	63 degrees C / 145 degrees F
Power	PEM 0	OK	
	PEM 1	OK	
	PEM 2	OK	
	PEM 3	OK	
	PEM 4	Absent	
	PEM 5	Absent	
Fans	Fan Tray 0 Fan 0	OK	Spinning at normal speed
	Fan Tray 0 Fan 1	OK	Spinning at normal speed
	Fan Tray 0 Fan 2	OK	Spinning at normal speed
	Fan Tray 0 Fan 3	OK	Spinning at normal speed
	Fan Tray 1 Fan 0	OK	Spinning at normal speed
	Fan Tray 1 Fan 1	OK	Spinning at normal speed
	Fan Tray 1 Fan 2	OK	Spinning at normal speed
	Fan Tray 1 Fan 3	OK	Spinning at normal speed
	Fan Tray 2 Fan 0	OK	Spinning at normal speed
	Fan Tray 2 Fan 1	OK	Spinning at normal speed
	Fan Tray 2 Fan 2	OK	Spinning at normal speed
	Fan Tray 2 Fan 3	OK	Spinning at normal speed
	Fan Tray 3 Fan 0	OK	Spinning at normal speed
	Fan Tray 3 Fan 1	OK	Spinning at normal speed
	Fan Tray 3 Fan 2	OK	Spinning at normal speed
	Fan Tray 3 Fan 3	OK	Spinning at normal speed

### show chassis environment (MX10008 Router)

```
user@host> show chassis environment
```

Class	Item	Status	Measurement
	Routing Engine 0 CPU	OK	41 degrees C / 105 degrees F
	Routing Engine 1 CPU	OK	40 degrees C / 104 degrees F
Temp	CB 0 Intake A Temp Sensor	OK	24 degrees C / 75 degrees F
	CB 0 Intake B Temp Sensor	OK	24 degrees C / 75 degrees F
	CB 0 Exhaust A Temp Sensor	OK	28 degrees C / 82 degrees F
	CB 0 Exhaust B Temp Sensor	OK	30 degrees C / 86 degrees F
	CB 0 Middle Temp Sensor	OK	28 degrees C / 82 degrees F
	CB 1 Intake A Temp Sensor	OK	24 degrees C / 75 degrees F
	CB 1 Intake B Temp Sensor	OK	23 degrees C / 73 degrees F
	CB 1 Exhaust A Temp Sensor	OK	27 degrees C / 80 degrees F
	CB 1 Exhaust B Temp Sensor	OK	29 degrees C / 84 degrees F
	CB 1 Middle Temp Sensor	OK	28 degrees C / 82 degrees F
	FPC 0 Intake-A Temp Sensor	OK	32 degrees C / 89 degrees F
	FPC 0 Exhaust-A Temp Sensor	OK	44 degrees C / 111 degrees F
	FPC 0 Exhaust-B Temp Sensor	OK	49 degrees C / 120 degrees F
	FPC 0 EA0 Temp Sensor	OK	66 degrees C / 150 degrees F
	FPC 0 EA0_XR0 Temp Sensor	OK	69 degrees C / 156 degrees F
	FPC 0 EA0_XR1 Temp Sensor	OK	73 degrees C / 163 degrees F

FPC 0 EA1 Temp Sensor	OK	60 degrees C / 140 degrees F
FPC 0 EA1_XR0 Temp Sensor	OK	64 degrees C / 147 degrees F
FPC 0 EA1_XR1 Temp Sensor	OK	63 degrees C / 145 degrees F
FPC 0 EA2 Temp Sensor	OK	68 degrees C / 154 degrees F
FPC 0 EA2_XR0 Temp Sensor	OK	73 degrees C / 163 degrees F
FPC 0 EA2_XR1 Temp Sensor	OK	72 degrees C / 161 degrees F
FPC 0 EA3 Temp Sensor	OK	63 degrees C / 145 degrees F
FPC 0 EA3_XR0 Temp Sensor	OK	66 degrees C / 150 degrees F
FPC 0 EA3_XR1 Temp Sensor	OK	65 degrees C / 149 degrees F
FPC 0 EA4 Temp Sensor	OK	68 degrees C / 154 degrees F
FPC 0 EA4_XR0 Temp Sensor	OK	71 degrees C / 159 degrees F
FPC 0 EA4_XR1 Temp Sensor	OK	70 degrees C / 158 degrees F
FPC 0 EA5 Temp Sensor	OK	56 degrees C / 132 degrees F
FPC 0 EA5_XR0 Temp Sensor	OK	61 degrees C / 141 degrees F
FPC 0 EA5_XR1 Temp Sensor	OK	63 degrees C / 145 degrees F
FPC 0 EA0_HMC0 Logic die	OK	75 degrees C / 167 degrees F
FPC 0 EA0_HMC0 DRAM botm	OK	72 degrees C / 161 degrees F
FPC 0 EA0_HMC1 Logic die	OK	75 degrees C / 167 degrees F
FPC 0 EA0_HMC1 DRAM botm	OK	72 degrees C / 161 degrees F
FPC 0 EA0_HMC2 Logic die	OK	77 degrees C / 170 degrees F
FPC 0 EA0_HMC2 DRAM botm	OK	74 degrees C / 165 degrees F
FPC 0 EA1_HMC0 Logic die	OK	72 degrees C / 161 degrees F
FPC 0 EA1_HMC0 DRAM botm	OK	69 degrees C / 156 degrees F
FPC 0 EA1_HMC1 Logic die	OK	73 degrees C / 163 degrees F
FPC 0 EA1_HMC1 DRAM botm	OK	70 degrees C / 158 degrees F
FPC 0 EA1_HMC2 Logic die	OK	72 degrees C / 161 degrees F
FPC 0 EA1_HMC2 DRAM botm	OK	69 degrees C / 156 degrees F
FPC 0 EA2_HMC0 Logic die	OK	80 degrees C / 176 degrees F
FPC 0 EA2_HMC0 DRAM botm	OK	77 degrees C / 170 degrees F
FPC 0 EA2_HMC1 Logic die	OK	80 degrees C / 176 degrees F
FPC 0 EA2_HMC1 DRAM botm	OK	77 degrees C / 170 degrees F
FPC 0 EA2_HMC2 Logic die	OK	79 degrees C / 174 degrees F
FPC 0 EA2_HMC2 DRAM botm	OK	76 degrees C / 168 degrees F
FPC 0 EA3_HMC0 Logic die	OK	77 degrees C / 170 degrees F
FPC 0 EA3_HMC0 DRAM botm	OK	74 degrees C / 165 degrees F
FPC 0 EA3_HMC1 Logic die	OK	78 degrees C / 172 degrees F
FPC 0 EA3_HMC1 DRAM botm	OK	75 degrees C / 167 degrees F
FPC 0 EA3_HMC2 Logic die	OK	77 degrees C / 170 degrees F
FPC 0 EA3_HMC2 DRAM botm	OK	74 degrees C / 165 degrees F
FPC 0 EA4_HMC0 Logic die	OK	80 degrees C / 176 degrees F
FPC 0 EA4_HMC0 DRAM botm	OK	77 degrees C / 170 degrees F
FPC 0 EA4_HMC1 Logic die	OK	81 degrees C / 177 degrees F
FPC 0 EA4_HMC1 DRAM botm	OK	78 degrees C / 172 degrees F
FPC 0 EA4_HMC2 Logic die	OK	80 degrees C / 176 degrees F
FPC 0 EA4_HMC2 DRAM botm	OK	77 degrees C / 170 degrees F
FPC 0 EA5_HMC0 Logic die	OK	68 degrees C / 154 degrees F
FPC 0 EA5_HMC0 DRAM botm	OK	65 degrees C / 149 degrees F
FPC 0 EA5_HMC1 Logic die	OK	68 degrees C / 154 degrees F
FPC 0 EA5_HMC1 DRAM botm	OK	65 degrees C / 149 degrees F
FPC 0 EA5_HMC2 Logic die	OK	67 degrees C / 152 degrees F
FPC 0 EA5_HMC2 DRAM botm	OK	64 degrees C / 147 degrees F
FPC 2 Intake-A Temp Sensor	OK	32 degrees C / 89 degrees F
FPC 2 Exhaust-A Temp Sensor	OK	52 degrees C / 125 degrees F
FPC 2 Exhaust-B Temp Sensor	OK	50 degrees C / 122 degrees F
FPC 2 EA0 Temp Sensor	OK	71 degrees C / 159 degrees F
FPC 2 EA0_XR0 Temp Sensor	OK	75 degrees C / 167 degrees F
FPC 2 EA0_XR1 Temp Sensor	OK	78 degrees C / 172 degrees F
FPC 2 EA1 Temp Sensor	OK	64 degrees C / 147 degrees F
FPC 2 EA1_XR0 Temp Sensor	OK	67 degrees C / 152 degrees F
FPC 2 EA1_XR1 Temp Sensor	OK	65 degrees C / 149 degrees F



FPC 2 EA2 Temp Sensor	OK	75 degrees C / 167 degrees F
FPC 2 EA2_XR0 Temp Sensor	OK	80 degrees C / 176 degrees F
FPC 2 EA2_XR1 Temp Sensor	OK	80 degrees C / 176 degrees F
FPC 2 EA3 Temp Sensor	OK	66 degrees C / 150 degrees F
FPC 2 EA3_XR0 Temp Sensor	OK	69 degrees C / 156 degrees F
FPC 2 EA3_XR1 Temp Sensor	OK	69 degrees C / 156 degrees F
FPC 2 EA4 Temp Sensor	OK	75 degrees C / 167 degrees F
FPC 2 EA4_XR0 Temp Sensor	OK	76 degrees C / 168 degrees F
FPC 2 EA4_XR1 Temp Sensor	OK	75 degrees C / 167 degrees F
FPC 2 EA5 Temp Sensor	OK	60 degrees C / 140 degrees F
FPC 2 EA5_XR0 Temp Sensor	OK	64 degrees C / 147 degrees F
FPC 2 EA5_XR1 Temp Sensor	OK	64 degrees C / 147 degrees F
FPC 2 EA0_HMC0 Logic die	OK	84 degrees C / 183 degrees F
FPC 2 EA0_HMC0 DRAM botm	OK	81 degrees C / 177 degrees F
FPC 2 EA0_HMC1 Logic die	OK	85 degrees C / 185 degrees F
FPC 2 EA0_HMC1 DRAM botm	OK	82 degrees C / 179 degrees F
FPC 2 EA0_HMC2 Logic die	OK	83 degrees C / 181 degrees F
FPC 2 EA0_HMC2 DRAM botm	OK	80 degrees C / 176 degrees F
FPC 2 EA1_HMC0 Logic die	OK	76 degrees C / 168 degrees F
FPC 2 EA1_HMC0 DRAM botm	OK	73 degrees C / 163 degrees F
FPC 2 EA1_HMC1 Logic die	OK	76 degrees C / 168 degrees F
FPC 2 EA1_HMC1 DRAM botm	OK	73 degrees C / 163 degrees F
FPC 2 EA1_HMC2 Logic die	OK	76 degrees C / 168 degrees F
FPC 2 EA1_HMC2 DRAM botm	OK	73 degrees C / 163 degrees F
FPC 2 EA2_HMC0 Logic die	OK	86 degrees C / 186 degrees F
FPC 2 EA2_HMC0 DRAM botm	OK	83 degrees C / 181 degrees F
FPC 2 EA2_HMC1 Logic die	OK	87 degrees C / 188 degrees F
FPC 2 EA2_HMC1 DRAM botm	OK	84 degrees C / 183 degrees F
FPC 2 EA2_HMC2 Logic die	OK	87 degrees C / 188 degrees F
FPC 2 EA2_HMC2 DRAM botm	OK	84 degrees C / 183 degrees F
FPC 2 EA3_HMC0 Logic die	OK	80 degrees C / 176 degrees F
FPC 2 EA3_HMC0 DRAM botm	OK	77 degrees C / 170 degrees F
FPC 2 EA3_HMC1 Logic die	OK	80 degrees C / 176 degrees F
FPC 2 EA3_HMC1 DRAM botm	OK	77 degrees C / 170 degrees F
FPC 2 EA3_HMC2 Logic die	OK	80 degrees C / 176 degrees F
FPC 2 EA3_HMC2 DRAM botm	OK	77 degrees C / 170 degrees F
FPC 2 EA4_HMC0 Logic die	OK	88 degrees C / 190 degrees F
FPC 2 EA4_HMC0 DRAM botm	OK	85 degrees C / 185 degrees F
FPC 2 EA4_HMC1 Logic die	OK	89 degrees C / 192 degrees F
FPC 2 EA4_HMC1 DRAM botm	OK	86 degrees C / 186 degrees F
FPC 2 EA4_HMC2 Logic die	OK	80 degrees C / 176 degrees F
FPC 2 EA4_HMC2 DRAM botm	OK	77 degrees C / 170 degrees F
FPC 2 EA5_HMC0 Logic die	OK	72 degrees C / 161 degrees F
FPC 2 EA5_HMC0 DRAM botm	OK	69 degrees C / 156 degrees F
FPC 2 EA5_HMC1 Logic die	OK	69 degrees C / 156 degrees F
FPC 2 EA5_HMC1 DRAM botm	OK	66 degrees C / 150 degrees F
FPC 2 EA5_HMC2 Logic die	OK	72 degrees C / 161 degrees F
FPC 2 EA5_HMC2 DRAM botm	OK	69 degrees C / 156 degrees F
FPC 3 Intake-A Temp Sensor	OK	30 degrees C / 86 degrees F
FPC 3 Exhaust-A Temp Sensor	OK	48 degrees C / 118 degrees F
FPC 3 Exhaust-B Temp Sensor	OK	44 degrees C / 111 degrees F
FPC 3 EA0 Temp Sensor	OK	60 degrees C / 140 degrees F
FPC 3 EA0_XR0 Temp Sensor	OK	65 degrees C / 149 degrees F
FPC 3 EA0_XR1 Temp Sensor	OK	67 degrees C / 152 degrees F
FPC 3 EA1 Temp Sensor	OK	54 degrees C / 129 degrees F
FPC 3 EA1_XR0 Temp Sensor	OK	59 degrees C / 138 degrees F
FPC 3 EA1_XR1 Temp Sensor	OK	58 degrees C / 136 degrees F
FPC 3 EA2 Temp Sensor	OK	62 degrees C / 143 degrees F
FPC 3 EA2_XR0 Temp Sensor	OK	66 degrees C / 150 degrees F
FPC 3 EA2_XR1 Temp Sensor	OK	66 degrees C / 150 degrees F

	FPC 3 EA3 Temp Sensor	OK	54 degrees C / 129 degrees F
	FPC 3 EA3_XR0 Temp Sensor	OK	57 degrees C / 134 degrees F
	FPC 3 EA3_XR1 Temp Sensor	OK	56 degrees C / 132 degrees F
	FPC 3 EA4 Temp Sensor	OK	68 degrees C / 154 degrees F
	FPC 3 EA4_XR0 Temp Sensor	OK	71 degrees C / 159 degrees F
	FPC 3 EA4_XR1 Temp Sensor	OK	70 degrees C / 158 degrees F
	FPC 3 EA5 Temp Sensor	OK	55 degrees C / 131 degrees F
	FPC 3 EA5_XR0 Temp Sensor	OK	58 degrees C / 136 degrees F
	FPC 3 EA5_XR1 Temp Sensor	OK	58 degrees C / 136 degrees F
	FPC 3 EA0_HMC0 Logic die	OK	69 degrees C / 156 degrees F
	FPC 3 EA0_HMC0 DRAM botm	OK	66 degrees C / 150 degrees F
	FPC 3 EA0_HMC1 Logic die	OK	70 degrees C / 158 degrees F
	FPC 3 EA0_HMC1 DRAM botm	OK	67 degrees C / 152 degrees F
	FPC 3 EA0_HMC2 Logic die	OK	69 degrees C / 156 degrees F
	FPC 3 EA0_HMC2 DRAM botm	OK	66 degrees C / 150 degrees F
	FPC 3 EA1_HMC0 Logic die	OK	67 degrees C / 152 degrees F
	FPC 3 EA1_HMC0 DRAM botm	OK	64 degrees C / 147 degrees F
	FPC 3 EA1_HMC1 Logic die	OK	64 degrees C / 147 degrees F
	FPC 3 EA1_HMC1 DRAM botm	OK	61 degrees C / 141 degrees F
	FPC 3 EA1_HMC2 Logic die	OK	64 degrees C / 147 degrees F
	FPC 3 EA1_HMC2 DRAM botm	OK	61 degrees C / 141 degrees F
	FPC 3 EA2_HMC0 Logic die	OK	74 degrees C / 165 degrees F
	FPC 3 EA2_HMC0 DRAM botm	OK	71 degrees C / 159 degrees F
	FPC 3 EA2_HMC1 Logic die	OK	76 degrees C / 168 degrees F
	FPC 3 EA2_HMC1 DRAM botm	OK	73 degrees C / 163 degrees F
	FPC 3 EA2_HMC2 Logic die	OK	74 degrees C / 165 degrees F
	FPC 3 EA2_HMC2 DRAM botm	OK	71 degrees C / 159 degrees F
	FPC 3 EA3_HMC0 Logic die	OK	69 degrees C / 156 degrees F
	FPC 3 EA3_HMC0 DRAM botm	OK	66 degrees C / 150 degrees F
	FPC 3 EA3_HMC1 Logic die	OK	68 degrees C / 154 degrees F
	FPC 3 EA3_HMC1 DRAM botm	OK	65 degrees C / 149 degrees F
	FPC 3 EA3_HMC2 Logic die	OK	68 degrees C / 154 degrees F
	FPC 3 EA3_HMC2 DRAM botm	OK	65 degrees C / 149 degrees F
	FPC 3 EA4_HMC0 Logic die	OK	81 degrees C / 177 degrees F
	FPC 3 EA4_HMC0 DRAM botm	OK	78 degrees C / 172 degrees F
	FPC 3 EA4_HMC1 Logic die	OK	80 degrees C / 176 degrees F
	FPC 3 EA4_HMC1 DRAM botm	OK	77 degrees C / 170 degrees F
	FPC 3 EA4_HMC2 Logic die	OK	81 degrees C / 177 degrees F
	FPC 3 EA4_HMC2 DRAM botm	OK	78 degrees C / 172 degrees F
	FPC 3 EA5_HMC0 Logic die	OK	68 degrees C / 154 degrees F
	FPC 3 EA5_HMC0 DRAM botm	OK	65 degrees C / 149 degrees F
	FPC 3 EA5_HMC1 Logic die	OK	70 degrees C / 158 degrees F
	FPC 3 EA5_HMC1 DRAM botm	OK	67 degrees C / 152 degrees F
	FPC 3 EA5_HMC2 Logic die	OK	69 degrees C / 156 degrees F
	FPC 3 EA5_HMC2 DRAM botm	OK	66 degrees C / 150 degrees F
Power	PEM 0	OK	29 degrees C / 84 degrees F
	PEM 1	OK	27 degrees C / 80 degrees F
	PEM 2	OK	30 degrees C / 86 degrees F
	PEM 3	Check	
	PEM 4	Check	
	PEM 5	Check	
Fans	Fan Tray 0 Fan 0	OK	Spinning at normal speed
	Fan Tray 0 Fan 1	OK	Spinning at normal speed
	Fan Tray 0 Fan 2	OK	Spinning at normal speed
	Fan Tray 0 Fan 3	OK	Spinning at normal speed
	Fan Tray 0 Fan 4	Failed	
	Fan Tray 0 Fan 5	Failed	
	Fan Tray 0 Fan 6	OK	Spinning at normal speed
	Fan Tray 0 Fan 7	OK	Spinning at normal speed
	Fan Tray 0 Fan 8	OK	Spinning at normal speed

Fan Tray 0 Fan 9	OK	Spinning at normal speed
Fan Tray 0 Fan 10	OK	Spinning at normal speed
Fan Tray 1 Fan 0	OK	Spinning at normal speed
Fan Tray 1 Fan 1	OK	Spinning at normal speed
Fan Tray 1 Fan 2	OK	Spinning at normal speed
Fan Tray 1 Fan 3	OK	Spinning at normal speed
Fan Tray 1 Fan 4	OK	Spinning at normal speed
Fan Tray 1 Fan 5	OK	Spinning at normal speed
Fan Tray 1 Fan 6	OK	Spinning at normal speed
Fan Tray 1 Fan 7	OK	Spinning at normal speed
Fan Tray 1 Fan 8	OK	Spinning at normal speed
Fan Tray 1 Fan 9	OK	Spinning at normal speed
Fan Tray 1 Fan 10	OK	Spinning at normal speed
SFB 0 Intake-A	OK	32 degrees C / 89 degrees F
SFB 0 Intake-B	OK	21 degrees C / 69 degrees F
SFB 0 Exhaust-A	OK	27 degrees C / 80 degrees F
SFB 0 Exhaust-B	OK	32 degrees C / 89 degrees F
SFB 0 PF0	OK	39 degrees C / 102 degrees F
SFB 0 PF1	OK	29 degrees C / 84 degrees F
SFB 1 Intake-A	OK	43 degrees C / 109 degrees F
SFB 1 Intake-B	OK	20 degrees C / 68 degrees F
SFB 1 Exhaust-A	OK	25 degrees C / 77 degrees F
SFB 1 Exhaust-B	OK	44 degrees C / 111 degrees F
SFB 1 PF0	OK	50 degrees C / 122 degrees F
SFB 1 PF1	OK	29 degrees C / 84 degrees F
SFB 2 Intake-A	OK	39 degrees C / 102 degrees F
SFB 2 Intake-B	OK	20 degrees C / 68 degrees F
SFB 2 Exhaust-A	OK	25 degrees C / 77 degrees F
SFB 2 Exhaust-B	OK	38 degrees C / 100 degrees F
SFB 2 PF0	OK	45 degrees C / 113 degrees F
SFB 2 PF1	OK	30 degrees C / 86 degrees F
SFB 3 Intake-A	OK	36 degrees C / 96 degrees F
SFB 3 Intake-B	OK	20 degrees C / 68 degrees F
SFB 3 Exhaust-A	OK	25 degrees C / 77 degrees F
SFB 3 Exhaust-B	OK	35 degrees C / 95 degrees F
SFB 3 PF0	OK	42 degrees C / 107 degrees F
SFB 3 PF1	OK	29 degrees C / 84 degrees F
SFB 4 Intake-A	OK	30 degrees C / 86 degrees F
SFB 4 Intake-B	OK	20 degrees C / 68 degrees F
SFB 4 Exhaust-A	OK	25 degrees C / 77 degrees F
SFB 4 Exhaust-B	OK	31 degrees C / 87 degrees F
SFB 4 PF0	OK	41 degrees C / 105 degrees F
SFB 4 PF1	OK	29 degrees C / 84 degrees F
SFB 5 Intake-A	OK	30 degrees C / 86 degrees F
SFB 5 Intake-B	OK	21 degrees C / 69 degrees F
SFB 5 Exhaust-A	OK	25 degrees C / 77 degrees F
SFB 5 Exhaust-B	OK	30 degrees C / 86 degrees F
SFB 5 PF0	OK	35 degrees C / 95 degrees F
SFB 5 PF1	OK	34 degrees C / 93 degrees F

### show chassis environment (MX204 Router)

```
user@host> show chassis environment
```

Class	Item	Status	Measurement
Temp	CB 0 Top Right Inlet Sensor	OK	35 degrees C / 95 degrees F
	CB 0 Top Left Inlet Sensor	OK	37 degrees C / 98 degrees F
	CB 0 Top Right Exhaust Sensor	OK	43 degrees C / 109 degrees F
	CB 0 Top Left Exhaust Sensor	OK	50 degrees C / 122 degrees F

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Class	Item	Status	Measurement
Temp	PEM 0	Absent	
	PEM 1	OK	22 degrees C / 71 degrees F
	SCG 0	OK	30 degrees C / 86 degrees F
	SCG 1	OK	30 degrees C / 86 degrees F
	Routing Engine 0	Present	
	Routing Engine 1	OK	27 degrees C / 80 degrees F
	CB 0	Present	
	CB 1	OK	33 degrees C / 91 degrees F
	SIB 0	Absent	
	SIB 1	Absent	
	SIB 2	Absent	
	SIB 3	Absent	
	SIB 4	Absent	
	FPC 4 Top	Testing	
	FPC 4 Bottom	Testing	
	FPC 5 Top	Testing	
	FPC 5 Bottom	Testing	
	FPC 6 Top	Testing	
	FPC 6 Bottom	Testing	
	FPM GBUS	OK	23 degrees C / 73 degrees F
FPM Display	Absent		
Fans	Top Left Front fan	OK	Spinning at normal speed
	Top Left Middle fan	OK	Spinning at normal speed
	Top Left Rear fan	OK	Spinning at normal speed
	Top Right Front fan	OK	Spinning at normal speed
	Top Right Middle fan	OK	Spinning at normal speed
	Top Right Rear fan	OK	Spinning at normal speed
	Bottom Left Front fan	OK	Spinning at normal speed
	Bottom Left Middle fan	OK	Spinning at normal speed
	Bottom Left Rear fan	OK	Spinning at normal speed
	Bottom Right Front fan	OK	Spinning at normal speed

	Bottom Right Middle fan OK	Spinning at normal speed
	Bottom Right Rear fan OK	Spinning at normal speed
	Fourth Blower from top OK	Spinning at normal speed
	Bottom Blower OK	Spinning at normal speed
	Middle Blower OK	Spinning at normal speed
	Top Blower OK	Spinning at normal speed
	Second Blower from top OK	Spinning at normal speed
Misc	CIP OK	
	SPMB 0 OK	
	SPMB 1 OK	

### show chassis environment (T4000 Router)

user@host> show chassis environment

Class	Item	Status	Measurement
Temp	PEM 0	OK	33 degrees C / 91 degrees F
	PEM 1	Absent	
	SCG 0	OK	33 degrees C / 91 degrees F
	SCG 1	OK	33 degrees C / 91 degrees F
	Routing Engine 0	OK	33 degrees C / 91 degrees F
	Routing Engine 0 CPU	OK	50 degrees C / 122 degrees F
	Routing Engine 1	OK	32 degrees C / 89 degrees F
	Routing Engine 1 CPU	OK	46 degrees C / 114 degrees F
	CB 0	OK	32 degrees C / 89 degrees F
	CB 1	OK	33 degrees C / 91 degrees F
	SIB 0	OK	42 degrees C / 107 degrees F
	SIB 1	OK	42 degrees C / 107 degrees F
	SIB 2	OK	42 degrees C / 107 degrees F
	SIB 3	OK	43 degrees C / 109 degrees F
	SIB 4	OK	45 degrees C / 113 degrees F
	FPC 0 Fan Intake	OK	34 degrees C / 93 degrees F
	FPC 0 Fan Exhaust	OK	48 degrees C / 118 degrees F
	FPC 0 PMB	OK	47 degrees C / 116 degrees F
	FPC 0 LMB0	OK	50 degrees C / 122 degrees F
	FPC 0 LMB1	OK	41 degrees C / 105 degrees F
	FPC 0 LMB2	OK	35 degrees C / 95 degrees F
	FPC 0 PFE1 LU2	OK	46 degrees C / 114 degrees F
	FPC 0 PFE1 LU0	OK	41 degrees C / 105 degrees F
	FPC 0 PFE0 LU0	OK	57 degrees C / 134 degrees F
	FPC 0 XF1	OK	46 degrees C / 114 degrees F
	FPC 0 XF0	OK	52 degrees C / 125 degrees F
	FPC 0 XM1	OK	41 degrees C / 105 degrees F
	FPC 0 XM0	OK	50 degrees C / 122 degrees F
	FPC 0 PFE0 LU1	OK	56 degrees C / 132 degrees F
	FPC 0 PFE0 LU2	OK	45 degrees C / 113 degrees F
	FPC 0 PFE1 LU1	OK	37 degrees C / 98 degrees F
	FPC 3 Fan Intake	OK	36 degrees C / 96 degrees F
	FPC 3 Fan Exhaust	OK	51 degrees C / 123 degrees F
	FPC 3 PMB	OK	43 degrees C / 109 degrees F
	FPC 3 LMB0	OK	57 degrees C / 134 degrees F
	FPC 3 LMB1	OK	54 degrees C / 129 degrees F
	FPC 3 LMB2	OK	38 degrees C / 100 degrees F
	FPC 3 PFE1 LU2	OK	63 degrees C / 145 degrees F
	FPC 3 PFE1 LU0	OK	45 degrees C / 113 degrees F
	FPC 3 PFE0 LU0	OK	69 degrees C / 156 degrees F
	FPC 3 XF1	OK	62 degrees C / 143 degrees F
	FPC 3 XF0	OK	63 degrees C / 145 degrees F
	FPC 3 XM1	OK	43 degrees C / 109 degrees F

	FPC 3 XM0	OK	67 degrees C / 152 degrees F
	FPC 3 PFE0 LU1	OK	63 degrees C / 145 degrees F
	FPC 3 PFE0 LU2	OK	66 degrees C / 150 degrees F
	FPC 3 PFE1 LU1	OK	41 degrees C / 105 degrees F
	FPC 5 Top	OK	39 degrees C / 102 degrees F
	FPC 5 Bottom	OK	38 degrees C / 100 degrees F
	FPC 6 Fan Intake	OK	33 degrees C / 91 degrees F
	FPC 6 Fan Exhaust	OK	49 degrees C / 120 degrees F
	FPC 6 PMB	OK	40 degrees C / 104 degrees F
	FPC 6 LMB0	OK	60 degrees C / 140 degrees F
	FPC 6 LMB1	OK	58 degrees C / 136 degrees F
	FPC 6 LMB2	OK	40 degrees C / 104 degrees F
	FPC 6 PFE1 LU2	OK	69 degrees C / 156 degrees F
	FPC 6 PFE1 LU0	OK	45 degrees C / 113 degrees F
	FPC 6 PFE0 LU0	OK	71 degrees C / 159 degrees F
	FPC 6 XF1	OK	58 degrees C / 136 degrees F
	FPC 6 XF0	OK	65 degrees C / 149 degrees F
	FPC 6 XM1	OK	39 degrees C / 102 degrees F
	FPC 6 XM0	OK	66 degrees C / 150 degrees F
	FPC 6 PFE0 LU1	OK	69 degrees C / 156 degrees F
	FPC 6 PFE0 LU2	OK	69 degrees C / 156 degrees F
	FPC 6 PFE1 LU1	OK	42 degrees C / 107 degrees F
	FPM GBUS	OK	24 degrees C / 75 degrees F
	FPM Display	OK	27 degrees C / 80 degrees F
Fans	Top Left Front fan	OK	Spinning at high speed
	Top Left Middle fan	OK	Spinning at high speed
	Top Left Rear fan	OK	Spinning at high speed
	Top Right Front fan	OK	Spinning at high speed
	Top Right Middle fan	OK	Spinning at high speed
	Top Right Rear fan	OK	Spinning at high speed
	Bottom Left Front fan	OK	Spinning at high speed
	Bottom Left Middle fan	OK	Spinning at high speed
	Bottom Left Rear fan	OK	Spinning at high speed
	Bottom Right Front fan	OK	Spinning at high speed
	Bottom Right Middle fan	OK	Spinning at high speed
	Bottom Right Rear fan	OK	Spinning at high speed
	Rear Tray Top fan	OK	Spinning at high speed
	Rear Tray Second fan	OK	Spinning at high speed
	Rear Tray Third fan	OK	Spinning at high speed
	Rear Tray Fourth fan	OK	Spinning at high speed
	Rear Tray Fifth fan	OK	Spinning at high speed
	Rear Tray Sixth fan	OK	Spinning at high speed
	Rear Tray Seventh fan	OK	Spinning at high speed
	Rear Tray Bottom fan	OK	Spinning at high speed
Misc	CIP	OK	
	SPMB 0	OK	
	SPMB 1	OK	

### show chassis environment (TX Matrix Router)

```
user@host> show chassis environment
```

-----			
Class	Item	Status	Measurement
Temp	PEM 0	Absent	
	PEM 1	OK	29 degrees C / 84 degrees F
	Routing Engine 0	OK	34 degrees C / 93 degrees F
	Routing Engine 1	OK	34 degrees C / 93 degrees F
	CB 0	OK	32 degrees C / 89 degrees F

	CB 1	OK	32 degrees C / 89 degrees F
	SIB 0	OK	44 degrees C / 111 degrees F
	SIB 0 (B)	OK	44 degrees C / 111 degrees F
	FPM GBUS	OK	27 degrees C / 80 degrees F
	FPM Display	OK	32 degrees C / 89 degrees F
Fans	Top Left Front fan	OK	Spinning at normal speed
	Top Left Middle fan	OK	Spinning at normal speed
	Top Left Rear fan	OK	Spinning at normal speed
	Top Right Front fan	OK	Spinning at normal speed
	Top Right Middle fan	OK	Spinning at normal speed
	Top Right Rear fan	OK	Spinning at normal speed
	Bottom Left Front fan	OK	Spinning at normal speed
	Bottom Left Middle fan	OK	Spinning at normal speed
	Bottom Left Rear fan	OK	Spinning at normal speed
	Bottom Right Front fan	OK	Spinning at normal speed
	Bottom Right Middle fan	OK	Spinning at normal speed
	Bottom Right Rear fan	OK	Spinning at normal speed
	Rear Tray Top fan	OK	Spinning at normal speed
	Rear Tray Second fan	OK	Spinning at normal speed
	Rear Tray Third fan	OK	Spinning at normal speed
	Rear Tray Fourth fan	OK	Spinning at normal speed
	Rear Tray Fifth fan	OK	Spinning at normal speed
	Rear Tray Sixth fan	OK	Spinning at normal speed
	Rear Tray Seventh fan	OK	Spinning at normal speed
	Rear Tray Bottom fan	OK	Spinning at normal speed
Misc	CIP 0	OK	
	CIP 1	OK	
	SPMB 0	OK	
	SPMB 1	OK	

1cc0-re0:

Class	Item	Status	Measurement
Temp	PEM 0	OK	29 degrees C / 84 degrees F
	PEM 1	Absent	
	SCG 0	OK	35 degrees C / 95 degrees F
	SCG 1	Absent	
	Routing Engine 0	OK	39 degrees C / 102 degrees F
	Routing Engine 1	OK	36 degrees C / 96 degrees F
	CB 0	OK	32 degrees C / 89 degrees F
	CB 1	OK	32 degrees C / 89 degrees F
	SIB 0	OK	40 degrees C / 104 degrees F
	SIB 0 (B)	OK	51 degrees C / 123 degrees F
	FPC 0 Top	OK	45 degrees C / 113 degrees F
	FPC 0 Bottom	OK	31 degrees C / 87 degrees F
	FPC 1 Top	OK	34 degrees C / 93 degrees F
	FPC 1 Bottom	OK	31 degrees C / 87 degrees F
Fans	FPM GBUS	OK	30 degrees C / 86 degrees F
	FPM Display	OK	34 degrees C / 93 degrees F
	Top Left Front fan	OK	Spinning at normal speed
	Top Left Middle fan	OK	Spinning at normal speed
	Top Left Rear fan	OK	Spinning at normal speed
	Top Right Front fan	OK	Spinning at normal speed
	Top Right Middle fan	OK	Spinning at normal speed
	Top Right Rear fan	OK	Spinning at normal speed
	Bottom Left Front fan	OK	Spinning at normal speed
	Bottom Left Middle fan	OK	Spinning at normal speed
	Bottom Left Rear fan	OK	Spinning at normal speed
	Bottom Right Front fan	OK	Spinning at normal speed
	Bottom Right Middle fan	OK	Spinning at normal speed

	Bottom Right Rear fan	OK	Spinning at normal speed
	Rear Tray Top fan	OK	Spinning at normal speed
	Rear Tray Second fan	OK	Spinning at normal speed
	Rear Tray Third fan	OK	Spinning at normal speed
	Rear Tray Fourth fan	OK	Spinning at normal speed
	Rear Tray Fifth fan	OK	Spinning at normal speed
	Rear Tray Sixth fan	OK	Spinning at normal speed
	Rear Tray Seventh fan	OK	Spinning at normal speed
	Rear Tray Bottom fan	OK	Spinning at normal speed
Misc	CIP	OK	
	SPMB 0	OK	
	SPMB 1	OK	
lcc2-re0:			
Class	Item	Status	Measurement
Temp	PEM 0	OK	29 degrees C / 84 degrees F
	PEM 1	Absent	
	SCG 0	OK	32 degrees C / 89 degrees F
	SCG 1	Absent	
	Routing Engine 0	OK	31 degrees C / 87 degrees F
	Routing Engine 1	OK	32 degrees C / 89 degrees F
	CB 0	OK	30 degrees C / 86 degrees F
	SIB 0	OK	38 degrees C / 100 degrees F
	SIB 0 (B)	OK	49 degrees C / 120 degrees F
	FPC 0 Top	OK	45 degrees C / 113 degrees F
	FPC 0 Bottom	OK	33 degrees C / 91 degrees F
	FPC 1 Top	OK	37 degrees C / 98 degrees F
	FPC 1 Bottom	OK	33 degrees C / 91 degrees F
	FPM GBUS	OK	30 degrees C / 86 degrees F
	FPM Display	OK	34 degrees C / 93 degrees F
Fans	Top Left Front fan	OK	Spinning at normal speed
	Top Left Middle fan	OK	Spinning at normal speed
...			

### show chassis environment (T1600 Router)

user@host> show chassis environment

Class	Item	Status	Measurement
Temp	PEM 0	OK	27 degrees C / 80 degrees F
	PEM 1	Absent	
	SCG 0	OK	31 degrees C / 87 degrees F
	SCG 1	OK	35 degrees C / 95 degrees F
	Routing Engine 0	OK	30 degrees C / 86 degrees F
	Routing Engine 1	OK	30 degrees C / 86 degrees F
	CB 0	OK	31 degrees C / 87 degrees F
	CB 1	OK	31 degrees C / 87 degrees F
	SIB 0	OK	41 degrees C / 105 degrees F
	SIB 0 (B)	OK	34 degrees C / 93 degrees F
	SIB 1	OK	0 degrees C / 32 degrees F
	SIB 1 (B)	OK	0 degrees C / 32 degrees F
	SIB 2	OK	0 degrees C / 32 degrees F
	SIB 2 (B)	OK	0 degrees C / 32 degrees F
	SIB 3	OK	0 degrees C / 32 degrees F
	SIB 3 (B)	OK	0 degrees C / 32 degrees F
	SIB 4	OK	0 degrees C / 32 degrees F
	SIB 4 (B)	OK	0 degrees C / 32 degrees F
	FPC 0 Top	OK	49 degrees C / 120 degrees F
	FPC 0 Bottom	OK	50 degrees C / 122 degrees F



Fans	FPC 1 Top	OK	48 degrees C / 118 degrees F
	FPC 1 Bottom	OK	49 degrees C / 120 degrees F
	FPM GBUS	OK	27 degrees C / 80 degrees F
	FPM Display	OK	30 degrees C / 86 degrees F
	Top Left Front fan	OK	Spinning at normal speed
	Top Left Middle fan	OK	Spinning at normal speed
	Top Left Rear fan	OK	Spinning at normal speed
	Top Right Front fan	OK	Spinning at normal speed
	Top Right Middle fan	OK	Spinning at normal speed
	Top Right Rear fan	OK	Spinning at normal speed
	Bottom Left Front fan	OK	Spinning at normal speed
	Bottom Left Middle fan	OK	Spinning at normal speed
	Bottom Left Rear fan	OK	Spinning at normal speed
	Bottom Right Front fan	OK	Spinning at normal speed
	Bottom Right Middle fan	OK	Spinning at normal speed
	Bottom Right Rear fan	OK	Spinning at normal speed
	Rear Tray Top fan	OK	Spinning at normal speed
	Rear Tray Second fan	OK	Spinning at normal speed
	Rear Tray Third fan	OK	Spinning at normal speed
	Rear Tray Fourth fan	OK	Spinning at normal speed
Misc	Rear Tray Fifth fan	OK	Spinning at normal speed
	Rear Tray Sixth fan	OK	Spinning at normal speed
	Rear Tray Seventh fan	OK	Spinning at normal speed
	Rear Tray Bottom fan	OK	Spinning at normal speed
	CIP	OK	
	SPMB 0	OK	
	SPMB 1	OK	

### show chassis environment (TX Matrix Plus Router)

```
user@host> show chassis environment
```

Class	Item	Status	Measurement
Temp	PEM 0	OK	28 degrees C / 82 degrees F
	PEM 1	Absent	
	Routing Engine 0	OK	27 degrees C / 80 degrees F
	Routing Engine 1	OK	29 degrees C / 84 degrees F
	CB 0 Intake	OK	26 degrees C / 78 degrees F
	CB 0 Exhaust A	OK	25 degrees C / 77 degrees F
	CB 0 Exhaust B	OK	25 degrees C / 77 degrees F
	CB 1 Intake	OK	26 degrees C / 78 degrees F
	CB 1 Exhaust A	OK	26 degrees C / 78 degrees F
	CB 1 Exhaust B	OK	26 degrees C / 78 degrees F
	SIB F13 0	OK	47 degrees C / 116 degrees F
	SIB F13 0 (B)	OK	48 degrees C / 118 degrees F
	SIB F13 1	OK	38 degrees C / 100 degrees F
	SIB F13 1 (B)	OK	37 degrees C / 98 degrees F
	SIB F2S 0/0	OK	27 degrees C / 80 degrees F
	SIB F2S 0/2	OK	28 degrees C / 82 degrees F
	SIB F2S 0/4	OK	27 degrees C / 80 degrees F
	SIB F2S 0/6	OK	28 degrees C / 82 degrees F
	SIB F2S 1/0	OK	26 degrees C / 78 degrees F
	SIB F2S 1/2	OK	26 degrees C / 78 degrees F
	SIB F2S 1/4	OK	26 degrees C / 78 degrees F
	SIB F2S 1/6	OK	26 degrees C / 78 degrees F
	SIB F2S 2/0	OK	25 degrees C / 77 degrees F
	SIB F2S 2/2	OK	25 degrees C / 77 degrees F
	SIB F2S 2/4	OK	23 degrees C / 73 degrees F

	CIP 0 Intake	OK	23 degrees C / 73 degrees F
	CIP 0 Exhaust A	OK	24 degrees C / 75 degrees F
	CIP 0 Exhaust B	OK	24 degrees C / 75 degrees F
	CIP 1 Intake	OK	24 degrees C / 75 degrees F
	CIP 1 Exhaust A	OK	25 degrees C / 77 degrees F
	CIP 1 Exhaust B	OK	25 degrees C / 77 degrees F
Fans	Fan Tray 0 Fan 1	OK	Spinning at normal speed
	Fan Tray 0 Fan 2	OK	Spinning at normal speed
	Fan Tray 0 Fan 3	OK	Spinning at normal speed
	Fan Tray 0 Fan 4	OK	Spinning at normal speed
	Fan Tray 0 Fan 5	OK	Spinning at normal speed
	Fan Tray 0 Fan 6	OK	Spinning at normal speed
	Fan Tray 1 Fan 1	OK	Spinning at normal speed
	Fan Tray 1 Fan 2	OK	Spinning at normal speed
	Fan Tray 1 Fan 3	OK	Spinning at normal speed
	Fan Tray 1 Fan 4	OK	Spinning at normal speed
	Fan Tray 1 Fan 5	OK	Spinning at normal speed
	Fan Tray 1 Fan 6	OK	Spinning at normal speed
	Fan Tray 2 Fan 1	OK	Spinning at normal speed
	Fan Tray 2 Fan 2	OK	Spinning at normal speed
	Fan Tray 2 Fan 3	OK	Spinning at normal speed
	Fan Tray 2 Fan 4	OK	Spinning at normal speed
	Fan Tray 2 Fan 5	OK	Spinning at normal speed
	Fan Tray 2 Fan 6	OK	Spinning at normal speed
	Fan Tray 2 Fan 7	OK	Spinning at normal speed
	Fan Tray 2 Fan 8	OK	Spinning at normal speed
	Fan Tray 2 Fan 9	OK	Spinning at normal speed
	Fan Tray 3 Fan 1	OK	Spinning at normal speed
	Fan Tray 3 Fan 2	OK	Spinning at normal speed
	Fan Tray 3 Fan 3	OK	Spinning at normal speed
	Fan Tray 3 Fan 4	OK	Spinning at normal speed
	Fan Tray 3 Fan 5	OK	Spinning at normal speed
	Fan Tray 3 Fan 6	OK	Spinning at normal speed
	Fan Tray 3 Fan 7	OK	Spinning at normal speed
	Fan Tray 3 Fan 8	OK	Spinning at normal speed
	Fan Tray 3 Fan 9	OK	Spinning at normal speed
	Fan Tray 4 Fan 1	OK	Spinning at normal speed
	Fan Tray 4 Fan 2	OK	Spinning at normal speed
	Fan Tray 4 Fan 3	OK	Spinning at normal speed
	Fan Tray 4 Fan 4	OK	Spinning at normal speed
	Fan Tray 4 Fan 5	OK	Spinning at normal speed
	Fan Tray 4 Fan 6	OK	Spinning at normal speed
	Fan Tray 4 Fan 7	OK	Spinning at normal speed
	Fan Tray 4 Fan 8	OK	Spinning at normal speed
	Fan Tray 4 Fan 9	OK	Spinning at normal speed
	Fan Tray 5 Fan 1	OK	Spinning at normal speed
	Fan Tray 5 Fan 2	OK	Spinning at normal speed
	Fan Tray 5 Fan 3	OK	Spinning at normal speed
	Fan Tray 5 Fan 4	OK	Spinning at normal speed
	Fan Tray 5 Fan 5	OK	Spinning at normal speed
	Fan Tray 5 Fan 6	OK	Spinning at normal speed
	Fan Tray 5 Fan 7	OK	Spinning at normal speed
	Fan Tray 5 Fan 8	OK	Spinning at normal speed
	Fan Tray 5 Fan 9	OK	Spinning at normal speed
Misc	SPMB 0	OK	
	SPMB 1	OK	
1cc0-re0:			
-----			
Class	Item	Status	Measurement

Temp	PEM 0	OK	27 degrees C / 80 degrees F
	PEM 1	Absent	
	SCG 0	OK	31 degrees C / 87 degrees F
	SCG 1	OK	35 degrees C / 95 degrees F
	Routing Engine 0	OK	30 degrees C / 86 degrees F
	Routing Engine 1	OK	30 degrees C / 86 degrees F
	CB 0	OK	31 degrees C / 87 degrees F
	CB 1	OK	31 degrees C / 87 degrees F
	SIB 0	OK	41 degrees C / 105 degrees F
	SIB 0 (B)	OK	34 degrees C / 93 degrees F
	SIB 1	OK	0 degrees C / 32 degrees F
	SIB 1 (B)	OK	0 degrees C / 32 degrees F
	SIB 2	OK	0 degrees C / 32 degrees F
	SIB 2 (B)	OK	0 degrees C / 32 degrees F
	SIB 3	OK	0 degrees C / 32 degrees F
	SIB 3 (B)	OK	0 degrees C / 32 degrees F
	SIB 4	OK	0 degrees C / 32 degrees F
	SIB 4 (B)	OK	0 degrees C / 32 degrees F
	FPC 0 Top	OK	49 degrees C / 120 degrees F
	FPC 0 Bottom	OK	50 degrees C / 122 degrees F
	FPC 1 Top	OK	48 degrees C / 118 degrees F
	FPC 1 Bottom	OK	49 degrees C / 120 degrees F
	FPM GBUS	OK	27 degrees C / 80 degrees F
	FPM Display	OK	30 degrees C / 86 degrees F
Fans	Top Left Front fan	OK	Spinning at normal speed
	Top Left Middle fan	OK	Spinning at normal speed
	Top Left Rear fan	OK	Spinning at normal speed
	Top Right Front fan	OK	Spinning at normal speed
	Top Right Middle fan	OK	Spinning at normal speed
	Top Right Rear fan	OK	Spinning at normal speed
	Bottom Left Front fan	OK	Spinning at normal speed
	Bottom Left Middle fan	OK	Spinning at normal speed
	Bottom Left Rear fan	OK	Spinning at normal speed
	Bottom Right Front fan	OK	Spinning at normal speed
	Bottom Right Middle fan	OK	Spinning at normal speed
	Bottom Right Rear fan	OK	Spinning at normal speed
	Rear Tray Top fan	OK	Spinning at normal speed
	Rear Tray Second fan	OK	Spinning at normal speed
	Rear Tray Third fan	OK	Spinning at normal speed
	Rear Tray Fourth fan	OK	Spinning at normal speed
	Rear Tray Fifth fan	OK	Spinning at normal speed
	Rear Tray Sixth fan	OK	Spinning at normal speed
	Rear Tray Seventh fan	OK	Spinning at normal speed
	Rear Tray Bottom fan	OK	Spinning at normal speed
Misc	CIP	OK	
	SPMB 0	OK	
	SPMB 1	OK	

### show chassis environment (TX Matrix Plus router with 3D SIBs)

```
user@host> show chassis environment
```

Class	Item	Status	Measurement
Temp	PEM 0	Check	30 degrees C / 86 degrees F
	PEM 1	OK	33 degrees C / 91 degrees F
	Routing Engine 0	OK	28 degrees C / 82 degrees F
	Routing Engine 0 CPU	OK	42 degrees C / 107 degrees F
	Routing Engine 1	OK	29 degrees C / 84 degrees F

	Routing Engine 1 CPU	OK	44 degrees C / 111 degrees F
	CB 0 Intake	OK	30 degrees C / 86 degrees F
	CB 0 Exhaust A	OK	28 degrees C / 82 degrees F
	CB 0 Exhaust B	OK	30 degrees C / 86 degrees F
	CB 1 Intake	OK	31 degrees C / 87 degrees F
	CB 1 Exhaust A	OK	27 degrees C / 80 degrees F
	CB 1 Exhaust B	OK	31 degrees C / 87 degrees F
	SIB F13 0 Board	OK	44 degrees C / 111 degrees F
	SIB F13 0 XF Junction	OK	62 degrees C / 143 degrees F
	SIB F13 3 Board	OK	45 degrees C / 113 degrees F
	SIB F13 3 XF Junction	OK	60 degrees C / 140 degrees F
	SIB F13 6 Board	OK	47 degrees C / 116 degrees F
	SIB F13 6 XF Junction	OK	62 degrees C / 143 degrees F
	SIB F2S 0/0 Board	OK	32 degrees C / 89 degrees F
	SIB F2S 0/0 XF Junction	OK	42 degrees C / 107 degrees F
	SIB F2S 0/2 Board	OK	31 degrees C / 87 degrees F
	SIB F2S 0/2 XF Junction	OK	41 degrees C / 105 degrees F
	SIB F2S 0/4 Board	OK	31 degrees C / 87 degrees F
	SIB F2S 0/4 XF Junction	OK	42 degrees C / 107 degrees F
	SIB F2S 0/6 Board	OK	31 degrees C / 87 degrees F
	SIB F2S 0/6 XF Junction	OK	41 degrees C / 105 degrees F
	SIB F2S 1/0 Board	OK	31 degrees C / 87 degrees F
	SIB F2S 1/0 XF Junction	OK	41 degrees C / 105 degrees F
	SIB F2S 1/2 Board	OK	29 degrees C / 84 degrees F
	SIB F2S 1/2 XF Junction	OK	39 degrees C / 102 degrees F
	SIB F2S 1/4 Board	OK	29 degrees C / 84 degrees F
	SIB F2S 1/4 XF Junction	OK	35 degrees C / 95 degrees F
	SIB F2S 1/6 Board	OK	30 degrees C / 86 degrees F
	SIB F2S 1/6 XF Junction	OK	41 degrees C / 105 degrees F
	SIB F2S 2/0 Board	OK	30 degrees C / 86 degrees F
	SIB F2S 2/0 XF Junction	OK	42 degrees C / 107 degrees F
	SIB F2S 2/2 Board	OK	28 degrees C / 82 degrees F
	SIB F2S 2/2 XF Junction	OK	39 degrees C / 102 degrees F
	SIB F2S 2/4 Board	OK	29 degrees C / 84 degrees F
	SIB F2S 2/4 XF Junction	OK	42 degrees C / 107 degrees F
	SIB F2S 2/6 Board	OK	29 degrees C / 84 degrees F
	SIB F2S 2/6 XF Junction	OK	41 degrees C / 105 degrees F
	CIP 0 Intake	OK	25 degrees C / 77 degrees F
	CIP 0 Exhaust A	OK	26 degrees C / 78 degrees F
	CIP 0 Exhaust B	OK	26 degrees C / 78 degrees F
	CIP 1 Intake	OK	26 degrees C / 78 degrees F
	CIP 1 Exhaust A	OK	27 degrees C / 80 degrees F
	CIP 1 Exhaust B	OK	27 degrees C / 80 degrees F
Fans	Fan Tray 0 Fan 1	OK	Spinning at normal speed
	Fan Tray 0 Fan 2	OK	Spinning at normal speed
	Fan Tray 0 Fan 3	OK	Spinning at normal speed
	Fan Tray 0 Fan 4	OK	Spinning at normal speed
	Fan Tray 0 Fan 5	OK	Spinning at normal speed
	Fan Tray 0 Fan 6	OK	Spinning at normal speed
	Fan Tray 1 Fan 1	OK	Spinning at normal speed
	Fan Tray 1 Fan 2	OK	Spinning at normal speed
	Fan Tray 1 Fan 3	OK	Spinning at normal speed
	Fan Tray 1 Fan 4	OK	Spinning at normal speed
	Fan Tray 1 Fan 5	OK	Spinning at normal speed
	Fan Tray 1 Fan 6	OK	Spinning at normal speed
	Fan Tray 2 Fan 1	OK	Spinning at normal speed
	Fan Tray 2 Fan 2	OK	Spinning at normal speed
	Fan Tray 2 Fan 3	OK	Spinning at normal speed
	Fan Tray 2 Fan 4	OK	Spinning at normal speed
	Fan Tray 2 Fan 5	OK	Spinning at normal speed

Fan Tray 2 Fan 6	OK	Spinning at normal speed
Fan Tray 2 Fan 7	OK	Spinning at normal speed
Fan Tray 2 Fan 8	OK	Spinning at normal speed
Fan Tray 2 Fan 9	OK	Spinning at normal speed
Fan Tray 3 Fan 1	OK	Spinning at normal speed
Fan Tray 3 Fan 2	OK	Spinning at normal speed
Fan Tray 3 Fan 3	OK	Spinning at normal speed
Fan Tray 3 Fan 4	OK	Spinning at normal speed
Fan Tray 3 Fan 5	OK	Spinning at normal speed
Fan Tray 3 Fan 6	OK	Spinning at normal speed
Fan Tray 3 Fan 7	OK	Spinning at normal speed
Fan Tray 3 Fan 8	OK	Spinning at normal speed
Fan Tray 3 Fan 9	OK	Spinning at normal speed
Fan Tray 4 Fan 1	OK	Spinning at normal speed
Fan Tray 4 Fan 2	OK	Spinning at normal speed
Fan Tray 4 Fan 3	OK	Spinning at normal speed
Fan Tray 4 Fan 4	OK	Spinning at normal speed
Fan Tray 4 Fan 5	OK	Spinning at normal speed
Fan Tray 4 Fan 6	OK	Spinning at normal speed
Fan Tray 4 Fan 7	OK	Spinning at normal speed
Fan Tray 4 Fan 8	OK	Spinning at normal speed
Fan Tray 4 Fan 9	OK	Spinning at normal speed
Fan Tray 5 Fan 1	OK	Spinning at normal speed
Fan Tray 5 Fan 2	OK	Spinning at normal speed
Fan Tray 5 Fan 3	OK	Spinning at normal speed
Fan Tray 5 Fan 4	OK	Spinning at normal speed
Fan Tray 5 Fan 5	OK	Spinning at normal speed
Fan Tray 5 Fan 6	OK	Spinning at normal speed
Fan Tray 5 Fan 7	OK	Spinning at normal speed
Fan Tray 5 Fan 8	OK	Spinning at normal speed
Fan Tray 5 Fan 9	Check	
Misc SPMB 0	OK	
SPMB 1	OK	

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Class	Item	Status	Measurement
Temp	PEM 0	OK	29 degrees C / 84 degrees F
	PEM 1	Check	29 degrees C / 84 degrees F
	SCG 0	OK	32 degrees C / 89 degrees F
	SCG 1	OK	33 degrees C / 91 degrees F
	Routing Engine 0	OK	32 degrees C / 89 degrees F
	Routing Engine 0 CPU	OK	51 degrees C / 123 degrees F
	Routing Engine 1	OK	32 degrees C / 89 degrees F
	Routing Engine 1 CPU	OK	49 degrees C / 120 degrees F
	CB 0	OK	34 degrees C / 93 degrees F
	CB 1	OK	34 degrees C / 93 degrees F
	SIB 0	OK	39 degrees C / 102 degrees F
	SIB 0 (B)	Absent	
	SIB 1	OK	39 degrees C / 102 degrees F
	SIB 1 (B)	Absent	
	SIB 2	OK	39 degrees C / 102 degrees F
	SIB 2 (B)	Absent	
	FPC 4 Top	OK	43 degrees C / 109 degrees F
	FPC 4 Bottom	OK	43 degrees C / 109 degrees F
	FPC 7 Fan Intake	OK	35 degrees C / 95 degrees F
	FPC 7 Fan Exhaust	OK	50 degrees C / 122 degrees F
	FPC 7 PMB	OK	50 degrees C / 122 degrees F
	FPC 7 LMB0	OK	55 degrees C / 131 degrees F
	FPC 7 LMB1	OK	49 degrees C / 120 degrees F

	FPC 7 LMB2	OK	39 degrees C / 102 degrees F
	FPC 7 PFE1 LU2	OK	55 degrees C / 131 degrees F
	FPC 7 PFE1 LU0	OK	45 degrees C / 113 degrees F
	FPC 7 PFE0 LU0	OK	62 degrees C / 143 degrees F
	FPC 7 XF1	OK	52 degrees C / 125 degrees F
	FPC 7 XF0	OK	61 degrees C / 141 degrees F
	FPC 7 XM1	OK	39 degrees C / 102 degrees F
	FPC 7 XM0	OK	56 degrees C / 132 degrees F
	FPC 7 PFE0 LU1	OK	60 degrees C / 140 degrees F
	FPC 7 PFE0 LU2	OK	55 degrees C / 131 degrees F
	FPC 7 PFE1 LU1	OK	41 degrees C / 105 degrees F
	FPM GBUS	OK	24 degrees C / 75 degrees F
	FPM Display	OK	28 degrees C / 82 degrees F
Fans	Top Left Front fan	OK	Spinning at normal speed
	Top Left Middle fan	OK	Spinning at normal speed
	Top Left Rear fan	OK	Spinning at normal speed
	Top Right Front fan	OK	Spinning at normal speed
	Top Right Middle fan	OK	Spinning at normal speed
	Top Right Rear fan	OK	Spinning at normal speed
	Bottom Left Front fan	OK	Spinning at normal speed
	Bottom Left Middle fan	OK	Spinning at normal speed
	Bottom Left Rear fan	OK	Spinning at normal speed
	Bottom Right Front fan	OK	Spinning at normal speed
	Bottom Right Middle fan	OK	Spinning at normal speed
	Bottom Right Rear fan	OK	Spinning at normal speed
	Rear Tray fan 1 (Top)	OK	Spinning at normal speed
	Rear Tray fan 2	OK	Spinning at normal speed
	Rear Tray fan 3	OK	Spinning at normal speed
	Rear Tray fan 4	OK	Spinning at normal speed
	Rear Tray fan 5	OK	Spinning at normal speed
	Rear Tray fan 6	OK	Spinning at normal speed
	Rear Tray fan 7	OK	Spinning at normal speed
	Rear Tray fan 8	OK	Spinning at normal speed
	Rear Tray fan 9	OK	Spinning at normal speed
	Rear Tray fan 10	OK	Spinning at normal speed
	Rear Tray fan 11	OK	Spinning at normal speed
	Rear Tray fan 12	OK	Spinning at normal speed
	Rear Tray fan 13	OK	Spinning at normal speed
	Rear Tray fan 14	OK	Spinning at normal speed
	Rear Tray fan 15	OK	Spinning at normal speed
	Rear Tray fan 16 (Bottom)	OK	Spinning at normal speed
Misc	CIP	OK	
	SPMB 0	OK	
	SPMB 1	OK	

### show chassis environment (EX4200 Standalone Switch)

```
user@switch> show chassis environment
```

Class	Item	Status	Measurement
Power	FPC 0 Power Supply 0	OK	
	FPC 0 Power Supply 1	Absent	
Temp	FPC 0 CPU	OK	41 degrees C / 105 degrees F
	FPC 0 EX-PFE1	OK	42 degrees C / 107 degrees F
	FPC 0 EX-PFE2	OK	46 degrees C / 114 degrees F
	FPC 0 GEPHY Front Left	OK	25 degrees C / 77 degrees F
	FPC 0 GEPHY Front Right	OK	27 degrees C / 80 degrees F
	FPC 0 Uplink Conn	OK	29 degrees C / 84 degrees F
Fans	FPC 0 Fan 1	OK	Spinning at normal speed

FPC 0 Fan 2	OK	Spinning at normal speed
FPC 0 Fan 3	OK	Spinning at normal speed

### show chassis environment (EX8216 Switch)

```
user@switch> show chassis environment
```

Class	Item	Status	Measurement
Power	PSU 0	OK	
	PSU 1	OK	
	PSU 2	OK	
	PSU 3	Check	
	PSU 4	Absent	
	PSU 5	Absent	
Temp	CB 0 Intake	OK	23 degrees C / 73 degrees F
	CB 0 Exhaust	OK	26 degrees C / 78 degrees F
	CB 1 Intake	OK	22 degrees C / 71 degrees F
	CB 1 Exhaust	OK	25 degrees C / 77 degrees F
	FPC 4 Intake	OK	49 degrees C / 120 degrees F
	FPC 4 Exhaust	OK	59 degrees C / 138 degrees F
	SIB 5 Intake	OK	25 degrees C / 77 degrees F
	SIB 5 Exhaust	OK	35 degrees C / 95 degrees F
	SIB 6 Intake	OK	25 degrees C / 77 degrees F
Fans	SIB 6 Exhaust	OK	38 degrees C / 100 degrees F
	Top Fan 1	OK	Spinning at normal speed
	Top Fan 2	OK	Spinning at normal speed
	Top Fan 3	OK	Spinning at normal speed
	Top Fan 4	OK	Spinning at normal speed
	Top Fan 5	OK	Spinning at normal speed
	Top Fan 6	OK	Spinning at normal speed
	Top Fan 7	OK	Spinning at normal speed
	Top Fan 8	OK	Spinning at normal speed
	Top Fan 9	OK	Spinning at normal speed
	Bottom Fan 1	OK	Spinning at normal speed
	Bottom Fan 2	OK	Spinning at normal speed
	Bottom Fan 3	OK	Spinning at normal speed
	Bottom Fan 4	OK	Spinning at normal speed
	Bottom Fan 5	OK	Spinning at normal speed
	Bottom Fan 6	OK	Spinning at normal speed
	Bottom Fan 7	OK	Spinning at normal speed
	Bottom Fan 8	OK	Spinning at normal speed
	Bottom Fan 9	OK	Spinning at normal speed

### show chassis environment (EX9200 Switch)

```
user@switch> show chassis environment
```

Class	Item	Status	Measurement
Temp	PEM 0	Check	
	PEM 1	OK	40 degrees C / 104 degrees F
	PEM 2	OK	40 degrees C / 104 degrees F
	PEM 3	Absent	
	Routing Engine 0	OK	35 degrees C / 95 degrees F
	Routing Engine 0 CPU	OK	33 degrees C / 91 degrees F
	Routing Engine 1	OK	38 degrees C / 100 degrees F
	Routing Engine 1 CPU	OK	33 degrees C / 91 degrees F
	CB 0 Intake	OK	35 degrees C / 95 degrees F
	CB 0 Exhaust A	OK	33 degrees C / 91 degrees F
	CB 0 Exhaust B	OK	40 degrees C / 104 degrees F

CB 0 ACBC	OK	39 degrees C / 102 degrees F
CB 0 XF A	OK	49 degrees C / 120 degrees F
CB 0 XF B	OK	46 degrees C / 114 degrees F
CB 1 Intake	OK	37 degrees C / 98 degrees F
CB 1 Exhaust A	OK	32 degrees C / 89 degrees F
CB 1 Exhaust B	OK	39 degrees C / 102 degrees F
CB 1 ACBC	OK	41 degrees C / 105 degrees F
CB 1 XF A	OK	49 degrees C / 120 degrees F
CB 1 XF B	OK	49 degrees C / 120 degrees F
FPC 2 Intake	OK	37 degrees C / 98 degrees F
FPC 2 Exhaust A	OK	40 degrees C / 104 degrees F
FPC 2 Exhaust B	OK	34 degrees C / 93 degrees F
FPC 2 LU 0 TCAM TSen	OK	44 degrees C / 111 degrees F
FPC 2 LU 0 TCAM Chip	OK	48 degrees C / 118 degrees F
FPC 2 LU 0 TSen	OK	44 degrees C / 111 degrees F
FPC 2 LU 0 Chip	OK	60 degrees C / 140 degrees F
FPC 2 MQ 0 TSen	OK	44 degrees C / 111 degrees F
FPC 2 MQ 0 Chip	OK	51 degrees C / 123 degrees F
FPC 3 Intake	OK	39 degrees C / 102 degrees F
FPC 3 Exhaust A	OK	51 degrees C / 123 degrees F
[...Output truncated...]		
Fans Top Rear Fan	OK	Spinning at intermediate-speed
Bottom Rear Fan	OK	Spinning at intermediate-speed
Top Middle Fan	OK	Spinning at intermediate-speed
Bottom Middle Fan	OK	Spinning at intermediate-speed
Top Front Fan	OK	Spinning at intermediate-speed
Bottom Front Fan	OK	Spinning at intermediate-speed

### show chassis environment (EX9251 Switch)

```
user@switch> show chassis environment
```

Class	Item	Status	Measurement
Temp	CB 0 Top Right Inlet Sensor	OK	29 degrees C / 84 degrees F
	CB 0 Top Left Inlet Sensor	OK	29 degrees C / 84 degrees F
	CB 0 Top Right Exhaust Sensor	OK	40 degrees C / 104 degrees F
	CB 0 Top Left Exhaust Sensor	OK	59 degrees C / 138 degrees F
	CB 0 CPU Core-0 Temp	OK	45 degrees C / 113 degrees F
	CB 0 CPU Core-1 Temp	OK	44 degrees C / 111 degrees F
	CB 0 CPU Core-2 Temp	OK	44 degrees C / 111 degrees F
	CB 0 CPU Core-3 Temp	OK	44 degrees C / 111 degrees F
	CB 0 CPU Core-4 Temp	OK	45 degrees C / 113 degrees F
	CB 0 CPU Core-5 Temp	OK	44 degrees C / 111 degrees F
	CB 0 CPU Core-6 Temp	OK	44 degrees C / 111 degrees F
	CB 0 CPU Core-7 Temp	OK	43 degrees C / 109 degrees F
Power	PEM 0	Check	
	PEM 1	OK	36 degrees C / 96 degrees F
Fans	Fan Tray 0 Fan 0	OK	Spinning at normal speed
	Fan Tray 0 Fan 1	OK	Spinning at normal speed
	Fan Tray 1 Fan 0	OK	Spinning at normal speed
	Fan Tray 1 Fan 1	OK	Spinning at normal speed
	Fan Tray 2 Fan 0	Absent	
	Fan Tray 2 Fan 1	Absent	

### show chassis environment (EX9253 Switch)

```
user@switch> show chassis environment
```



Class	Item	Status	Measurement
Temp	CB 0 Exhaust Temp Sensor	OK	37 degrees C / 98 degrees F
	CB 0 Inlet Temp Sensor	OK	31 degrees C / 87 degrees F
	CB 0 CPU DIE Temp Sensor	OK	42 degrees C / 107 degrees F
	CB 1 Exhaust Temp Sensor	OK	31 degrees C / 87 degrees F
	CB 1 Inlet Temp Sensor	OK	28 degrees C / 82 degrees F
	CB 1 CPU DIE Temp Sensor	OK	42 degrees C / 107 degrees F
	FPC 0 Intake Temp Sensor	OK	31 degrees C / 87 degrees F
	FPC 0 Exhaust-A Temp Sensor	OK	58 degrees C / 136 degrees F
	FPC 0 Exhaust-B Temp Sensor	OK	47 degrees C / 116 degrees F
	FPC 1 Intake Temp Sensor	OK	29 degrees C / 84 degrees F
	FPC 1 Exhaust-A Temp Sensor	OK	59 degrees C / 138 degrees F
	FPC 1 Exhaust-B Temp Sensor	OK	48 degrees C / 118 degrees F
Power	PEM 0	OK	54 degrees C / 129 degrees F
	PEM 1	Check	
	PEM 2	Absent	
	PEM 3	Absent	
	PEM 4	Check	
	PEM 5	OK	61 degrees C / 141 degrees F
Fans	Fan Tray 0 Fan 0	OK	Spinning at normal speed
	Fan Tray 0 Fan 1	OK	Spinning at normal speed
	Fan Tray 0 Fan 2	OK	Spinning at normal speed
	Fan Tray 0 Fan 3	OK	Spinning at normal speed
	Fan Tray 1 Fan 0	OK	Spinning at normal speed
	Fan Tray 1 Fan 1	OK	Spinning at normal speed
	Fan Tray 1 Fan 2	OK	Spinning at normal speed
	Fan Tray 1 Fan 3	OK	Spinning at normal speed
	Fan Tray 2 Fan 0	OK	Spinning at normal speed
	Fan Tray 2 Fan 1	OK	Spinning at normal speed
	Fan Tray 2 Fan 2	OK	Spinning at normal speed
	Fan Tray 2 Fan 3	OK	Spinning at normal speed
	Fan Tray 3 Fan 0	OK	Spinning at normal speed
	Fan Tray 3 Fan 1	OK	Spinning at normal speed
	Fan Tray 3 Fan 2	OK	Spinning at normal speed
	Fan Tray 3 Fan 3	OK	Spinning at normal speed

### show chassis environment (QFX Series and OCX Series)

```
user@switch> show chassis environment
```

Class	Item	Status	Measurement
Temp	CB 0 Top Right Inlet Sensor	OK	29 degrees C / 84 degrees F
	CB 0 Top Left Inlet Sensor	OK	29 degrees C / 84 degrees F
	CB 0 Top Right Exhaust Sensor	OK	40 degrees C / 104 degrees F
	CB 0 Top Left Exhaust Sensor	OK	59 degrees C / 138 degrees F
	CB 0 CPU Core-0 Temp	OK	45 degrees C / 113 degrees F
	CB 0 CPU Core-1 Temp	OK	44 degrees C / 111 degrees F
	CB 0 CPU Core-2 Temp	OK	44 degrees C / 111 degrees F
	CB 0 CPU Core-3 Temp	OK	44 degrees C / 111 degrees F
	CB 0 CPU Core-4 Temp	OK	45 degrees C / 113 degrees F
	CB 0 CPU Core-5 Temp	OK	44 degrees C / 111 degrees F
	CB 0 CPU Core-6 Temp	OK	44 degrees C / 111 degrees F
	CB 0 CPU Core-7 Temp	OK	43 degrees C / 109 degrees F
Power	PEM 0	Check	
	PEM 1	OK	36 degrees C / 96 degrees F
Fans	Fan Tray 0 Fan 0	OK	Spinning at normal speed
	Fan Tray 0 Fan 1	OK	Spinning at normal speed
	Fan Tray 1 Fan 0	OK	Spinning at normal speed
	Fan Tray 1 Fan 1	OK	Spinning at normal speed

Fan Tray 2 Fan 0	Absent
Fan Tray 2 Fan 1	Absent

### show chassis environment interconnect-device (QFabric System)

```
user@switch> show chassis environment interconnect-device IC-A0004
```

Class	Item	Status	Measurement
	CB 0		
	CB 0 L Intake	OK	30 degrees C / 86 degrees F
	CB 0 R Intake	OK	31 degrees C / 87 degrees F
	CB 0 L Exhaust	OK	32 degrees C / 89 degrees F
	CB 0 R Exhaust	OK	33 degrees C / 91 degrees F
	Routing Engine 0 CPU temp	OK	51 degrees C / 123 degrees F
	CB 1		
	CB 1 L Intake	OK	27 degrees C / 80 degrees F
	CB 1 R Intake	OK	29 degrees C / 84 degrees F
	CB 1 L Exhaust	OK	31 degrees C / 87 degrees F
	CB 1 R Exhaust	OK	32 degrees C / 89 degrees F
	Routing Engine 1 CPU temp	OK	40 degrees C / 104 degrees F
	FC 0 FPC 0		
	FPC 0 L Intake	OK	25 degrees C / 77 degrees F
	FPC 0 R Intake	OK	28 degrees C / 82 degrees F
	FPC 0 L Exhaust	OK	28 degrees C / 82 degrees F
	FPC 0 R Exhaust	OK	29 degrees C / 84 degrees F
	FC 7 FPC 7		
	FPC 7 L Intake	OK	25 degrees C / 77 degrees F
	FPC 7 R Intake	OK	26 degrees C / 78 degrees F
	FPC 7 L Exhaust	OK	28 degrees C / 82 degrees F
	FPC 7 R Exhaust	OK	29 degrees C / 84 degrees F
	RC 0 FPC 8		
	FPC 8 L Intake	OK	25 degrees C / 77 degrees F
	FPC 8 R Intake	OK	26 degrees C / 78 degrees F
	FPC 8 L Exhaust	OK	32 degrees C / 89 degrees F
	FPC 8 R Exhaust	OK	30 degrees C / 86 degrees F
	RC 7 FPC 15		
	FPC 15 L Intake	OK	24 degrees C / 75 degrees F
	FPC 15 R Intake	OK	25 degrees C / 77 degrees F
	FPC 15 L Exhaust	OK	33 degrees C / 91 degrees F
	FPC 15 R Exhaust	OK	31 degrees C / 87 degrees F
Fans	TFT 0 Fan 0	OK	Spinning at normal speed
Fans	TFT 0 Fan 1	OK	Spinning at normal speed
Fans	TFT 0 Fan 2	OK	Spinning at normal speed
Fans	TFT 0 Fan 3	OK	Spinning at normal speed
Fans	TFT 0 Fan 4	OK	Spinning at normal speed
Fans	TFT 0 Fan 5	OK	Spinning at normal speed
Fans	BFT 1 Fan 0	OK	Spinning at normal speed
Fans	BFT 1 Fan 1	OK	Spinning at normal speed
Fans	BFT 1 Fan 2	OK	Spinning at normal speed
Fans	BFT 1 Fan 3	Check	
Fans	BFT 1 Fan 4	OK	Spinning at normal speed
Fans	BFT 1 Fan 5	OK	Spinning at normal speed
Fans	SFT 0 Fan 0 Rotor 0	OK	Spinning at normal speed
Fans	SFT 0 Fan 0 Rotor 1	OK	Spinning at normal speed
Fans	SFT 0 Fan 1 Rotor 0	OK	Spinning at normal speed
Fans	SFT 0 Fan 1 Rotor 1	OK	Spinning at normal speed
Fans	SFT 0 Fan 2 Rotor 0	OK	Spinning at normal speed
Fans	SFT 0 Fan 2 Rotor 1	OK	Spinning at normal speed
Fans	SFT 0 Fan 3 Rotor 0	OK	Spinning at normal speed
Fans	SFT 0 Fan 3 Rotor 1	OK	Spinning at normal speed

Fans	SFT 1	Fan 0	Rotor 0	OK	Spinning at normal speed
Fans	SFT 1	Fan 0	Rotor 1	OK	Spinning at normal speed
Fans	SFT 1	Fan 1	Rotor 0	OK	Spinning at normal speed
Fans	SFT 1	Fan 1	Rotor 1	OK	Spinning at normal speed
Fans	SFT 1	Fan 2	Rotor 0	OK	Spinning at normal speed
Fans	SFT 1	Fan 2	Rotor 1	OK	Spinning at normal speed
Fans	SFT 1	Fan 3	Rotor 0	OK	Spinning at normal speed
Fans	SFT 1	Fan 3	Rotor 1	OK	Spinning at normal speed
Fans	SFT 2	Fan 0	Rotor 0	OK	Spinning at normal speed
Fans	SFT 2	Fan 0	Rotor 1	OK	Spinning at normal speed
Fans	SFT 2	Fan 1	Rotor 0	OK	Spinning at normal speed
Fans	SFT 2	Fan 1	Rotor 1	OK	Spinning at normal speed
Fans	SFT 2	Fan 2	Rotor 0	OK	Spinning at normal speed
Fans	SFT 2	Fan 2	Rotor 1	OK	Spinning at normal speed
Fans	SFT 2	Fan 3	Rotor 0	OK	Spinning at normal speed
Fans	SFT 2	Fan 3	Rotor 1	OK	Spinning at normal speed
Fans	SFT 3	Fan 0	Rotor 0	OK	Spinning at normal speed
Fans	SFT 3	Fan 0	Rotor 1	OK	Spinning at normal speed
Fans	SFT 3	Fan 1	Rotor 0	OK	Spinning at normal speed
Fans	SFT 3	Fan 1	Rotor 1	OK	Spinning at normal speed
Fans	SFT 3	Fan 2	Rotor 0	OK	Spinning at normal speed
Fans	SFT 3	Fan 2	Rotor 1	OK	Spinning at normal speed
Fans	SFT 3	Fan 3	Rotor 0	OK	Spinning at normal speed
Fans	SFT 3	Fan 3	Rotor 1	OK	Spinning at normal speed
Fans	SFT 4	Fan 0	Rotor 0	OK	Spinning at normal speed
Fans	SFT 4	Fan 0	Rotor 1	OK	Spinning at normal speed
Fans	SFT 4	Fan 1	Rotor 0	OK	Spinning at normal speed
Fans	SFT 4	Fan 1	Rotor 1	OK	Spinning at normal speed
Fans	SFT 4	Fan 2	Rotor 0	OK	Spinning at normal speed
Fans	SFT 4	Fan 2	Rotor 1	OK	Spinning at normal speed
Fans	SFT 4	Fan 3	Rotor 0	OK	Spinning at normal speed
Fans	SFT 4	Fan 3	Rotor 1	OK	Spinning at normal speed
Fans	SFT 5	Fan 0	Rotor 0	OK	Spinning at normal speed
Fans	SFT 5	Fan 0	Rotor 1	OK	Spinning at normal speed
Fans	SFT 5	Fan 1	Rotor 0	OK	Spinning at normal speed
Fans	SFT 5	Fan 1	Rotor 1	OK	Spinning at normal speed
Fans	SFT 5	Fan 2	Rotor 0	OK	Spinning at normal speed
Fans	SFT 5	Fan 2	Rotor 1	OK	Spinning at normal speed
Fans	SFT 5	Fan 3	Rotor 0	OK	Spinning at normal speed
Fans	SFT 5	Fan 3	Rotor 1	OK	Spinning at normal speed
Fans	SFT 6	Fan 0	Rotor 0	OK	Spinning at normal speed
Fans	SFT 6	Fan 0	Rotor 1	OK	Spinning at normal speed
Fans	SFT 6	Fan 1	Rotor 0	OK	Spinning at normal speed
Fans	SFT 6	Fan 1	Rotor 1	OK	Spinning at normal speed
Fans	SFT 6	Fan 2	Rotor 0	OK	Spinning at normal speed
Fans	SFT 6	Fan 2	Rotor 1	OK	Spinning at normal speed
Fans	SFT 6	Fan 3	Rotor 0	OK	Spinning at normal speed
Fans	SFT 6	Fan 3	Rotor 1	OK	Spinning at normal speed
Fans	SFT 7	Fan 0	Rotor 0	OK	Spinning at normal speed
Fans	SFT 7	Fan 0	Rotor 1	OK	Spinning at normal speed
Fans	SFT 7	Fan 1	Rotor 0	OK	Spinning at normal speed
Fans	SFT 7	Fan 1	Rotor 1	OK	Spinning at normal speed
Fans	SFT 7	Fan 2	Rotor 0	OK	Spinning at normal speed
Fans	SFT 7	Fan 2	Rotor 1	OK	Spinning at normal speed
Fans	SFT 7	Fan 3	Rotor 0	OK	Spinning at normal speed
Fans	SFT 7	Fan 3	Rotor 1	OK	Spinning at normal speed
Power	PEM 0			OK	30 degrees C / 86 degrees F
Power	PEM 1			OK	30 degrees C / 86 degrees F
Power	PEM 2			OK	30 degrees C / 86 degrees F
Power	PEM 3			Absent	

Power	PEM 4	Absent
Power	PEM 5	Absent

### show chassis environment node-device (QFabric System)

```
user@switch> show chassis environment node-device node1
```

Class	Item	Status	Measurement
Power	node1 Power Supply 0	Absent	
	node1 Power Supply 1	Absent	
Fans	node1 Fan Tray 0	Testing	
	node1 Fan Tray 1	Testing	
	node1 Fan Tray 2	Testing	

### show chassis environment pem node-device (QFabric System)

```
user@switch> show chassis environment pem node-device node1
```

```
FPC 0 PEM 0 status:
  State           Check
  Airflow         Front to Back
  Temperature      OK
  AC Input:       OK
  DC Output       Voltage(V) Current(A) Power(W) Load(%)
                  12          10       120     18

FPC 0 PEM 1 status:
  State           Online
  Airflow         Back to Front
  Temperature      OK
  AC Input:       OK
  DC Output       Voltage(V) Current(A) Power(W) Load(%)
                  11          10       110     17
```

### show chassis environment (PTX5000 Packet Transport Router)

```
user@host> show chassis environment
```

Class	Item	Status	Measurement
Temp	PDU 0	OK	
	PDU 0 PSM 0	OK	36 degrees C / 96 degrees F
	PDU 0 PSM 1	OK	38 degrees C / 100 degrees F
	PDU 0 PSM 2	OK	38 degrees C / 100 degrees F
	PDU 0 PSM 3	OK	37 degrees C / 98 degrees F
	PDU 1	Absent	
	CCG 0	OK	44 degrees C / 111 degrees F
	CCG 1	OK	44 degrees C / 111 degrees F
	Routing Engine 0	OK	62 degrees C / 143 degrees F
	Routing Engine 0 CPU	OK	75 degrees C / 167 degrees F
	Routing Engine 1	OK	51 degrees C / 123 degrees F
	Routing Engine 1 CPU	OK	64 degrees C / 147 degrees F
	CB 0 Intake	OK	38 degrees C / 100 degrees F
	CB 0 Exhaust A	OK	46 degrees C / 114 degrees F
	CB 0 Exhaust B	OK	42 degrees C / 107 degrees F
	CB 1 Intake	OK	35 degrees C / 95 degrees F
	CB 1 Exhaust A	OK	39 degrees C / 102 degrees F
	CB 1 Exhaust B	OK	36 degrees C / 96 degrees F
	SIB 0 Exhaust	OK	47 degrees C / 116 degrees F
	SIB 0 Junction	OK	45 degrees C / 113 degrees F
	SIB 1 Exhaust	OK	44 degrees C / 111 degrees F

SIB 1 Junction	OK	43 degrees C / 109 degrees F
SIB 2 Exhaust	OK	47 degrees C / 116 degrees F
SIB 2 Junction	OK	42 degrees C / 107 degrees F
SIB 3 Exhaust	OK	43 degrees C / 109 degrees F
SIB 3 Junction	OK	43 degrees C / 109 degrees F
SIB 4 Exhaust	OK	47 degrees C / 116 degrees F
SIB 4 Junction	OK	42 degrees C / 107 degrees F
SIB 5 Exhaust	OK	42 degrees C / 107 degrees F
SIB 5 Junction	OK	40 degrees C / 104 degrees F
SIB 6 Exhaust	OK	46 degrees C / 114 degrees F
SIB 6 Junction	OK	42 degrees C / 107 degrees F
SIB 7 Exhaust	OK	43 degrees C / 109 degrees F
SIB 7 Junction	OK	39 degrees C / 102 degrees F
SIB 8 Exhaust	OK	44 degrees C / 111 degrees F
SIB 8 Junction	OK	41 degrees C / 105 degrees F
FPC 0 PMB	OK	35 degrees C / 95 degrees F
FPC 0 Intake	OK	33 degrees C / 91 degrees F
FPC 0 Exhaust A	OK	51 degrees C / 123 degrees F
FPC 0 Exhaust B	OK	43 degrees C / 109 degrees F
FPC 0 TL0	OK	48 degrees C / 118 degrees F
FPC 0 TQ0	OK	53 degrees C / 127 degrees F
FPC 0 TL1	OK	56 degrees C / 132 degrees F
FPC 0 TQ1	OK	58 degrees C / 136 degrees F
FPC 0 TL2	OK	55 degrees C / 131 degrees F
FPC 0 TQ2	OK	56 degrees C / 132 degrees F
FPC 0 TL3	OK	59 degrees C / 138 degrees F
FPC 0 TQ3	OK	59 degrees C / 138 degrees F
FPC 2 PMB	OK	35 degrees C / 95 degrees F
FPC 2 Intake	OK	34 degrees C / 93 degrees F
FPC 2 Exhaust A	OK	51 degrees C / 123 degrees F
FPC 2 Exhaust B	OK	52 degrees C / 125 degrees F
FPC 2 TL0	OK	53 degrees C / 127 degrees F
FPC 2 TQ0	OK	53 degrees C / 127 degrees F
FPC 2 TL1	OK	57 degrees C / 134 degrees F
FPC 2 TQ1	OK	58 degrees C / 136 degrees F
FPC 2 TL2	OK	54 degrees C / 129 degrees F
FPC 2 TQ2	OK	59 degrees C / 138 degrees F
FPC 2 TL3	OK	60 degrees C / 140 degrees F
FPC 2 TQ3	OK	64 degrees C / 147 degrees F
PIC 2/0 Ambient	OK	49 degrees C / 120 degrees F
FPC 3 PMB	OK	34 degrees C / 93 degrees F
FPC 3 Intake	OK	35 degrees C / 95 degrees F
FPC 3 Exhaust A	OK	54 degrees C / 129 degrees F
FPC 3 Exhaust B	OK	49 degrees C / 120 degrees F
FPC 3 TL0	OK	49 degrees C / 120 degrees F
FPC 3 TQ0	OK	55 degrees C / 131 degrees F
FPC 3 TL1	OK	56 degrees C / 132 degrees F
FPC 3 TQ1	OK	58 degrees C / 136 degrees F
FPC 3 TL2	OK	56 degrees C / 132 degrees F
FPC 3 TQ2	OK	59 degrees C / 138 degrees F
FPC 3 TL3	OK	62 degrees C / 143 degrees F
FPC 3 TQ3	OK	63 degrees C / 145 degrees F
PIC 3/1	Absent	
FPC 5 PMB	OK	35 degrees C / 95 degrees F
FPC 5 Intake	OK	34 degrees C / 93 degrees F
FPC 5 Exhaust A	OK	51 degrees C / 123 degrees F
FPC 5 Exhaust B	OK	53 degrees C / 127 degrees F
FPC 5 TL0	OK	54 degrees C / 129 degrees F
FPC 5 TQ0	OK	52 degrees C / 125 degrees F
FPC 5 TL1	OK	61 degrees C / 141 degrees F

	FPC 5 TQ1	OK	60 degrees C / 140 degrees F
	FPC 5 TL2	OK	55 degrees C / 131 degrees F
	FPC 5 TQ2	OK	55 degrees C / 131 degrees F
	FPC 5 TL3	OK	59 degrees C / 138 degrees F
	FPC 5 TQ3	OK	58 degrees C / 136 degrees F
	PIC 5/0 Ambient	OK	51 degrees C / 123 degrees F
	PIC 5/1 Ambient	OK	34 degrees C / 93 degrees F
	PIC 5/1 cfp-5/1/0	OK	34 degrees C / 93 degrees F
	PIC 5/1 cfp-5/1/1	OK	36 degrees C / 96 degrees F
	FPC 6 PMB	OK	36 degrees C / 96 degrees F
	FPC 6 Intake	OK	33 degrees C / 91 degrees F
	FPC 6 Exhaust A	OK	51 degrees C / 123 degrees F
	FPC 6 Exhaust B	OK	39 degrees C / 102 degrees F
	FPC 6 TL0	OK	44 degrees C / 111 degrees F
	FPC 6 TQ0	OK	54 degrees C / 129 degrees F
	FPC 6 TL1	OK	59 degrees C / 138 degrees F
	FPC 6 TQ1	OK	58 degrees C / 136 degrees F
	FPC 6 TL2	OK	60 degrees C / 140 degrees F
	FPC 6 TQ2	OK	57 degrees C / 134 degrees F
	FPC 6 TL3	OK	65 degrees C / 149 degrees F
	FPC 6 TQ3	OK	60 degrees C / 140 degrees F
	FPC 7 PMB	OK	35 degrees C / 95 degrees F
	FPC 7 Intake	OK	33 degrees C / 91 degrees F
	FPC 7 Exhaust A	OK	53 degrees C / 127 degrees F
	FPC 7 Exhaust B	OK	40 degrees C / 104 degrees F
	FPC 7 TL0	OK	46 degrees C / 114 degrees F
	FPC 7 TQ0	OK	58 degrees C / 136 degrees F
	FPC 7 TL1	OK	53 degrees C / 127 degrees F
	FPC 7 TQ1	OK	59 degrees C / 138 degrees F
	FPC 7 TL2	OK	56 degrees C / 132 degrees F
	FPC 7 TQ2	OK	61 degrees C / 141 degrees F
	FPC 7 TL3	OK	63 degrees C / 145 degrees F
	FPC 7 TQ3	OK	63 degrees C / 145 degrees F
	FPM I2CS	OK	37 degrees C / 98 degrees F
Fans	Fan Tray 0 Fan 1	OK	3042 RPM
	Fan Tray 0 Fan 2	OK	3042 RPM
	Fan Tray 0 Fan 3	OK	3000 RPM
	Fan Tray 0 Fan 4	OK	3042 RPM
	Fan Tray 0 Fan 5	OK	3000 RPM
	Fan Tray 0 Fan 6	OK	3042 RPM
	Fan Tray 0 Fan 7	OK	3085 RPM
	Fan Tray 0 Fan 8	OK	3042 RPM
	Fan Tray 0 Fan 9	OK	3042 RPM
	Fan Tray 0 Fan 10	OK	3085 RPM
	Fan Tray 0 Fan 11	OK	3085 RPM
	Fan Tray 0 Fan 12	OK	3128 RPM
	Fan Tray 0 Fan 13	OK	3128 RPM
	Fan Tray 0 Fan 14	OK	3042 RPM
	Fan Tray 1 Fan 1	OK	2299 RPM
	Fan Tray 1 Fan 2	OK	2399 RPM
	Fan Tray 1 Fan 3	OK	2299 RPM
	Fan Tray 1 Fan 4	OK	2266 RPM
	Fan Tray 1 Fan 5	OK	2266 RPM
	Fan Tray 1 Fan 6	OK	2366 RPM
	Fan Tray 2 Fan 1	OK	2199 RPM
	Fan Tray 2 Fan 2	OK	2133 RPM
	Fan Tray 2 Fan 3	OK	2366 RPM
	Fan Tray 2 Fan 4	OK	2233 RPM
	Fan Tray 2 Fan 5	OK	2399 RPM
	Fan Tray 2 Fan 6	OK	2233 RPM

Misc	SPMB 0 Intake	OK	50 degrees C / 122 degrees F
	SPMB 1 Intake	OK	40 degrees C / 104 degrees F

### show chassis environment (PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```
user@host> show chassis environment
```

Class	Item	Status	Measurement
Temp	PDU 0	OK	
	PDU 0 PSM 0	OK	41 degrees C / 105 degrees F
	PDU 0 PSM 1	Absent	
	PDU 0 PSM 2	OK	43 degrees C / 109 degrees F
	PDU 0 PSM 3	Absent	
	PDU 0 PSM 4	OK	44 degrees C / 111 degrees F
	PDU 0 PSM 5	Absent	
	PDU 0 PSM 6	OK	45 degrees C / 113 degrees F
	PDU 0 PSM 7	Absent	
	PDU 1	OK	
	PDU 1 PSM 0	Absent	
	PDU 1 PSM 1	OK	45 degrees C / 113 degrees F
	PDU 1 PSM 2	Absent	
	PDU 1 PSM 3	OK	43 degrees C / 109 degrees F
	PDU 1 PSM 4	Absent	
	PDU 1 PSM 5	OK	46 degrees C / 114 degrees F
	PDU 1 PSM 6	Absent	
	PDU 1 PSM 7	OK	46 degrees C / 114 degrees F
	CCG 0	OK	27 degrees C / 80 degrees F
	CCG 1	OK	29 degrees C / 84 degrees F
...			

### show chassis environment (PTX1000 Packet Transport Router)

```
user@host> show chassis environment
```

Class	Item	Status	Measurement
Power	FPC 0 Power Supply 0	Absent	
	FPC 0 Power Supply 1	Absent	
	FPC 0 Power Supply 2	OK	
	FPC 0 Power Supply 3	OK	
Temp	FPC 0 Intake Temp Sensor	OK	25 degrees C / 77 degrees F
	FPC 0 Exhaust Temp Sensor	OK	35 degrees C / 95 degrees F
	FPC 0 Mezz Temp Sensor 0	OK	25 degrees C / 77 degrees F
	FPC 0 Mezz Temp Sensor 1	OK	34 degrees C / 93 degrees F
	FPC 0 PE2 Temp Sensor	OK	34 degrees C / 93 degrees F
	FPC 0 PE1 Temp Sensor	OK	32 degrees C / 89 degrees F
	FPC 0 PF0 Temp Sensor	OK	40 degrees C / 104 degrees F
	FPC 0 PE0 Temp Sensor	OK	33 degrees C / 91 degrees F
	FPC 0 PE5 Temp Sensor	OK	34 degrees C / 93 degrees F
	FPC 0 PE4 Temp Sensor	OK	34 degrees C / 93 degrees F
	FPC 0 PF1 Temp Sensor	OK	41 degrees C / 105 degrees F
	FPC 0 PE3 Temp Sensor	OK	36 degrees C / 96 degrees F
	FPC 0 CPU Die Temp Sensor	OK	40 degrees C / 104 degrees F
	FPC 0 OCX0 Temp Sensor	OK	37 degrees C / 98 degrees F
Fans	FPC 0 Fan Tray 0	OK	Spinning at normal speed
	FPC 0 Fan Tray 1	OK	Spinning at normal speed
	FPC 0 Fan Tray 2	OK	Spinning at normal speed

## show chassis environment (PTX10008 Router)

user@host&gt; show chassis environment

Class	Item	Status	Measurement
Temp	Routing Engine 0 CPU	OK	40 degrees C / 104 degrees F
	Routing Engine 1 CPU	OK	40 degrees C / 104 degrees F
	CB 0 Intake Temp Sensor	OK	29 degrees C / 84 degrees F
	CB 0 Exhaust Temp Sensor	OK	33 degrees C / 91 degrees F
	CB 1 Intake Temp Sensor	OK	28 degrees C / 82 degrees F
	CB 1 Exhaust Temp Sensor	OK	32 degrees C / 89 degrees F
	FPC 0 Intake-A Temp Sensor	OK	38 degrees C / 100 degrees F
	FPC 0 Intake-B Temp Sensor	OK	34 degrees C / 93 degrees F
	FPC 0 Exhaust-A Temp Sensor	OK	36 degrees C / 96 degrees F
	FPC 0 Exhaust-B Temp Sensor	OK	37 degrees C / 98 degrees F
	FPC 0 Exhaust-C Temp Sensor	OK	40 degrees C / 104 degrees F
	FPC 0 PE0 Temp Sensor	OK	40 degrees C / 104 degrees F
	FPC 0 PE1 Temp Sensor	OK	42 degrees C / 107 degrees F
	FPC 0 PE2 Temp Sensor	OK	44 degrees C / 111 degrees F
	FPC 0 LCPU Temp Sensor	OK	41 degrees C / 105 degrees F
	FPC 1 Intake-A Temp Sensor	OK	37 degrees C / 98 degrees F
	FPC 1 Intake-B Temp Sensor	OK	33 degrees C / 91 degrees F
	FPC 1 Exhaust-A Temp Sensor	OK	37 degrees C / 98 degrees F
	FPC 1 Exhaust-B Temp Sensor	OK	38 degrees C / 100 degrees F
	FPC 1 Exhaust-C Temp Sensor	OK	40 degrees C / 104 degrees F
	FPC 1 PE0 Temp Sensor	OK	41 degrees C / 105 degrees F
	FPC 1 PE1 Temp Sensor	OK	41 degrees C / 105 degrees F
	FPC 1 PE2 Temp Sensor	OK	45 degrees C / 113 degrees F
	FPC 1 LCPU Temp Sensor	OK	40 degrees C / 104 degrees F
	FPC 2 Intake-A Temp Sensor	OK	44 degrees C / 111 degrees F
	FPC 2 Intake-B Temp Sensor	OK	30 degrees C / 86 degrees F
	FPC 2 Exhaust-A Temp Sensor	OK	52 degrees C / 125 degrees F
	FPC 2 Exhaust-B Temp Sensor	OK	54 degrees C / 129 degrees F
	FPC 2 Exhaust-C Temp Sensor	OK	52 degrees C / 125 degrees F
	FPC 2 PE0 Temp Sensor	OK	49 degrees C / 120 degrees F
	FPC 2 PE1 Temp Sensor	OK	59 degrees C / 138 degrees F
	FPC 2 PE2 Temp Sensor	OK	49 degrees C / 120 degrees F
	FPC 2 PE3 Temp Sensor	OK	60 degrees C / 140 degrees F
	FPC 2 PE4 Temp Sensor	OK	49 degrees C / 120 degrees F
	FPC 2 PE5 Temp Sensor	OK	63 degrees C / 145 degrees F
	FPC 2 LCPU Temp Sensor	OK	47 degrees C / 116 degrees F
	FPC 3 Intake-A Temp Sensor	OK	42 degrees C / 107 degrees F
	FPC 3 Intake-B Temp Sensor	OK	30 degrees C / 86 degrees F
	FPC 3 Exhaust-A Temp Sensor	OK	46 degrees C / 114 degrees F
	FPC 3 Exhaust-B Temp Sensor	OK	48 degrees C / 118 degrees F
	FPC 3 Exhaust-C Temp Sensor	OK	47 degrees C / 116 degrees F
	FPC 3 PE0 Temp Sensor	OK	47 degrees C / 116 degrees F
	FPC 3 PE1 Temp Sensor	OK	53 degrees C / 127 degrees F
	FPC 3 PE2 Temp Sensor	OK	46 degrees C / 114 degrees F
	FPC 3 PE3 Temp Sensor	OK	53 degrees C / 127 degrees F
	FPC 3 PE4 Temp Sensor	OK	48 degrees C / 118 degrees F
	FPC 3 PE5 Temp Sensor	OK	57 degrees C / 134 degrees F
	FPC 3 LCPU Temp Sensor	OK	47 degrees C / 116 degrees F
	FPC 5 Intake-A Temp Sensor	Failed	
	FPC 5 Intake-B Temp Sensor	Failed	
	FPC 5 Exhaust-A Temp Sensor	OK	40 degrees C / 104 degrees F
	FPC 5 Exhaust-B Temp Sensor	OK	40 degrees C / 104 degrees F
	FPC 5 Exhaust-C Temp Sensor	OK	41 degrees C / 105 degrees F
	FPC 5 PE0 Temp Sensor	OK	46 degrees C / 114 degrees F
	FPC 5 PE1 Temp Sensor	OK	48 degrees C / 118 degrees F
	FPC 5 PE2 Temp Sensor	OK	51 degrees C / 123 degrees F



	FPC 5 LCPu Temp Sensor	Failed	
	FPC 6 Intake-A Temp Sensor	OK	40 degrees C / 104 degrees F
	FPC 6 Intake-B Temp Sensor	OK	36 degrees C / 96 degrees F
	FPC 6 Exhaust-A Temp Sensor	OK	39 degrees C / 102 degrees F
	FPC 6 Exhaust-B Temp Sensor	OK	39 degrees C / 102 degrees F
	FPC 6 Exhaust-C Temp Sensor	OK	39 degrees C / 102 degrees F
	FPC 6 PE0 Temp Sensor	OK	44 degrees C / 111 degrees F
	FPC 6 PE1 Temp Sensor	OK	45 degrees C / 113 degrees F
	FPC 6 PE2 Temp Sensor	OK	50 degrees C / 122 degrees F
	FPC 6 LCPu Temp Sensor	OK	40 degrees C / 104 degrees F
	SIB 0 Intake-A Temp Sensor	OK	37 degrees C / 98 degrees F
	SIB 0 Intake-B Temp Sensor	OK	30 degrees C / 86 degrees F
	SIB 0 Exhaust-A Temp Sensor	OK	33 degrees C / 91 degrees F
	SIB 0 Exhaust-B Temp Sensor	OK	38 degrees C / 100 degrees F
	SIB 0 PF0 Temp Sensor	OK	46 degrees C / 114 degrees F
	SIB 0 PF1 Temp Sensor	OK	39 degrees C / 102 degrees F
	SIB 1 Intake-A Temp Sensor	OK	43 degrees C / 109 degrees F
	SIB 1 Intake-B Temp Sensor	OK	34 degrees C / 93 degrees F
	SIB 1 Exhaust-A Temp Sensor	OK	36 degrees C / 96 degrees F
	SIB 1 Exhaust-B Temp Sensor	OK	44 degrees C / 111 degrees F
	SIB 1 PF0 Temp Sensor	OK	54 degrees C / 129 degrees F
	SIB 1 PF1 Temp Sensor	OK	41 degrees C / 105 degrees F
	SIB 2 Intake-A Temp Sensor	OK	46 degrees C / 114 degrees F
	SIB 2 Intake-B Temp Sensor	OK	35 degrees C / 95 degrees F
	SIB 2 Exhaust-A Temp Sensor	OK	37 degrees C / 98 degrees F
	SIB 2 Exhaust-B Temp Sensor	OK	47 degrees C / 116 degrees F
	SIB 2 PF0 Temp Sensor	OK	55 degrees C / 131 degrees F
	SIB 2 PF1 Temp Sensor	OK	42 degrees C / 107 degrees F
	SIB 3 Intake-A Temp Sensor	OK	45 degrees C / 113 degrees F
	SIB 3 Intake-B Temp Sensor	OK	35 degrees C / 95 degrees F
	SIB 3 Exhaust-A Temp Sensor	OK	36 degrees C / 96 degrees F
	SIB 3 Exhaust-B Temp Sensor	OK	45 degrees C / 113 degrees F
	SIB 3 PF0 Temp Sensor	OK	54 degrees C / 129 degrees F
	SIB 3 PF1 Temp Sensor	OK	42 degrees C / 107 degrees F
	SIB 4 Intake-A Temp Sensor	OK	46 degrees C / 114 degrees F
	SIB 4 Intake-B Temp Sensor	OK	34 degrees C / 93 degrees F
	SIB 4 Exhaust-A Temp Sensor	OK	36 degrees C / 96 degrees F
	SIB 4 Exhaust-B Temp Sensor	OK	46 degrees C / 114 degrees F
	SIB 4 PF0 Temp Sensor	OK	54 degrees C / 129 degrees F
	SIB 4 PF1 Temp Sensor	OK	41 degrees C / 105 degrees F
	SIB 5 Intake-A Temp Sensor	OK	38 degrees C / 100 degrees F
	SIB 5 Intake-B Temp Sensor	OK	31 degrees C / 87 degrees F
	SIB 5 Exhaust-A Temp Sensor	OK	34 degrees C / 93 degrees F
	SIB 5 Exhaust-B Temp Sensor	OK	39 degrees C / 102 degrees F
	SIB 5 PF0 Temp Sensor	OK	44 degrees C / 111 degrees F
	SIB 5 PF1 Temp Sensor	OK	42 degrees C / 107 degrees F
Power	Power Supply 0	OK	
	Power Supply 1	OK	
	Power Supply 2	OK	
	Power Supply 3	OK	
	Power Supply 4	Check	
	Power Supply 5	OK	
Fans	Fan Tray 0 Fan 0	OK	Spinning at normal speed
	Fan Tray 0 Fan 1	OK	Spinning at normal speed
	Fan Tray 0 Fan 2	OK	Spinning at normal speed
	Fan Tray 0 Fan 3	OK	Spinning at normal speed
	Fan Tray 0 Fan 4	Failed	
	Fan Tray 0 Fan 5	Failed	
	Fan Tray 0 Fan 6	OK	Spinning at normal speed
	Fan Tray 0 Fan 7	OK	Spinning at normal speed

Fan Tray 0 Fan 8	OK	Spinning at normal speed
Fan Tray 0 Fan 9	OK	Spinning at normal speed
Fan Tray 0 Fan 10	OK	Spinning at normal speed
Fan Tray 1 Fan 0	OK	Spinning at normal speed
Fan Tray 1 Fan 1	OK	Spinning at normal speed
Fan Tray 1 Fan 2	OK	Spinning at normal speed
Fan Tray 1 Fan 3	OK	Spinning at normal speed
Fan Tray 1 Fan 4	OK	Spinning at normal speed
Fan Tray 1 Fan 5	OK	Spinning at normal speed
Fan Tray 1 Fan 6	OK	Spinning at normal speed
Fan Tray 1 Fan 7	OK	Spinning at normal speed
Fan Tray 1 Fan 8	OK	Spinning at normal speed
Fan Tray 1 Fan 9	OK	Spinning at normal speed
Fan Tray 1 Fan 10	OK	Spinning at normal speed

**show chassis environment (PTX10016 Router)**

```
user@host> show chassis environment
```

Class	Item	Status	Measurement
	Routing Engine 0 CPU	OK	34 degrees C / 93 degrees F
	Routing Engine 1 CPU	OK	34 degrees C / 93 degrees F
Temp	CB 0 Intake Temp Sensor	OK	20 degrees C / 68 degrees F
	CB 0 Exhaust Temp Sensor	OK	24 degrees C / 75 degrees F
	CB 1 Intake Temp Sensor	OK	20 degrees C / 68 degrees F
	CB 1 Exhaust Temp Sensor	OK	23 degrees C / 73 degrees F
	FPC 1 Intake-A Temp Sensor	OK	37 degrees C / 98 degrees F
	FPC 1 Intake-B Temp Sensor	OK	32 degrees C / 89 degrees F
	FPC 1 Exhaust-A Temp Sensor	OK	37 degrees C / 98 degrees F
	FPC 1 Exhaust-B Temp Sensor	OK	36 degrees C / 96 degrees F
	FPC 1 Exhaust-C Temp Sensor	OK	36 degrees C / 96 degrees F
	FPC 1 PE0 Temp Sensor	OK	45 degrees C / 113 degrees F
	FPC 1 PE1 Temp Sensor	OK	46 degrees C / 114 degrees F
	FPC 1 PE2 Temp Sensor	OK	54 degrees C / 129 degrees F
	FPC 1 LCPU Temp Sensor	OK	35 degrees C / 95 degrees F
	FPC 3 Intake-A Temp Sensor	OK	35 degrees C / 95 degrees F
	FPC 3 Intake-B Temp Sensor	OK	31 degrees C / 87 degrees F
	FPC 3 Exhaust-A Temp Sensor	OK	36 degrees C / 96 degrees F
	FPC 3 Exhaust-B Temp Sensor	OK	35 degrees C / 95 degrees F
	FPC 3 Exhaust-C Temp Sensor	OK	33 degrees C / 91 degrees F
	FPC 3 PE0 Temp Sensor	OK	43 degrees C / 109 degrees F
	FPC 3 PE1 Temp Sensor	OK	45 degrees C / 113 degrees F
	FPC 3 PE2 Temp Sensor	OK	49 degrees C / 120 degrees F
	FPC 3 LCPU Temp Sensor	OK	35 degrees C / 95 degrees F
	FPC 6 Intake-A Temp Sensor	OK	34 degrees C / 93 degrees F
	FPC 6 Intake-B Temp Sensor	OK	31 degrees C / 87 degrees F
	FPC 6 Exhaust-A Temp Sensor	OK	35 degrees C / 95 degrees F
	FPC 6 Exhaust-B Temp Sensor	OK	35 degrees C / 95 degrees F
	FPC 6 Exhaust-C Temp Sensor	OK	35 degrees C / 95 degrees F
	FPC 6 PE0 Temp Sensor	OK	43 degrees C / 109 degrees F
	FPC 6 PE1 Temp Sensor	OK	43 degrees C / 109 degrees F
	FPC 6 PE2 Temp Sensor	OK	47 degrees C / 116 degrees F
	FPC 6 LCPU Temp Sensor	OK	35 degrees C / 95 degrees F
	FPC 8 Intake-A Temp Sensor	OK	34 degrees C / 93 degrees F
	FPC 8 Intake-B Temp Sensor	OK	31 degrees C / 87 degrees F
	FPC 8 Exhaust-A Temp Sensor	OK	37 degrees C / 98 degrees F
	FPC 8 Exhaust-B Temp Sensor	OK	37 degrees C / 98 degrees F
	FPC 8 Exhaust-C Temp Sensor	OK	38 degrees C / 100 degrees F
	FPC 8 PE0 Temp Sensor	OK	42 degrees C / 107 degrees F
	FPC 8 PE1 Temp Sensor	OK	44 degrees C / 111 degrees F

	FPC 8 PE2 Temp Sensor	OK	47 degrees C / 116 degrees F
	FPC 8 LCPU Temp Sensor	OK	33 degrees C / 91 degrees F
	FPC 9 Intake-A Temp Sensor	OK	44 degrees C / 111 degrees F
	FPC 9 Intake-B Temp Sensor	OK	28 degrees C / 82 degrees F
	FPC 9 Exhaust-A Temp Sensor	OK	51 degrees C / 123 degrees F
	FPC 9 Exhaust-B Temp Sensor	OK	52 degrees C / 125 degrees F
	FPC 9 Exhaust-C Temp Sensor	OK	48 degrees C / 118 degrees F
	FPC 9 PE0 Temp Sensor	OK	52 degrees C / 125 degrees F
	FPC 9 PE1 Temp Sensor	OK	66 degrees C / 150 degrees F
	FPC 9 PE2 Temp Sensor	OK	50 degrees C / 122 degrees F
	FPC 9 PE3 Temp Sensor	OK	65 degrees C / 149 degrees F
	FPC 9 PE4 Temp Sensor	OK	51 degrees C / 123 degrees F
	FPC 9 PE5 Temp Sensor	OK	68 degrees C / 154 degrees F
	FPC 9 LCPU Temp Sensor	OK	46 degrees C / 114 degrees F
Power	Power Supply 0	OK	22 degrees C / 71 degrees F
	Power Supply 1	OK	23 degrees C / 73 degrees F
	Power Supply 2	OK	23 degrees C / 73 degrees F
	Power Supply 3	OK	21 degrees C / 69 degrees F
	Power Supply 4	OK	22 degrees C / 71 degrees F
	Power Supply 5	OK	25 degrees C / 77 degrees F
	Power Supply 6	OK	21 degrees C / 69 degrees F
	Power Supply 7	Absent	
	Power Supply 8	Absent	
	Power Supply 9	Absent	
Fans	Fan Tray 0 Fan 0	OK	Spinning at normal speed
	Fan Tray 0 Fan 1	OK	Spinning at normal speed
	Fan Tray 0 Fan 2	OK	Spinning at normal speed
	Fan Tray 0 Fan 3	OK	Spinning at normal speed
	Fan Tray 0 Fan 4	OK	Spinning at normal speed
	Fan Tray 0 Fan 5	OK	Spinning at normal speed
	Fan Tray 0 Fan 6	OK	Spinning at normal speed
	Fan Tray 0 Fan 7	OK	Spinning at normal speed
	Fan Tray 0 Fan 8	OK	Spinning at normal speed
	Fan Tray 0 Fan 9	OK	Spinning at normal speed
	Fan Tray 0 Fan 10	OK	Spinning at normal speed
	Fan Tray 0 Fan 11	OK	Spinning at normal speed
	Fan Tray 0 Fan 12	OK	Spinning at normal speed
	Fan Tray 0 Fan 13	OK	Spinning at normal speed
	Fan Tray 0 Fan 14	OK	Spinning at normal speed
	Fan Tray 0 Fan 15	OK	Spinning at normal speed
	Fan Tray 0 Fan 16	OK	Spinning at normal speed
	Fan Tray 0 Fan 17	OK	Spinning at normal speed
	Fan Tray 0 Fan 18	OK	Spinning at normal speed
	Fan Tray 0 Fan 19	OK	Spinning at normal speed
	Fan Tray 0 Fan 20	OK	Spinning at normal speed
	Fan Tray 1 Fan 0	OK	Spinning at normal speed
	Fan Tray 1 Fan 1	OK	Spinning at normal speed
	Fan Tray 1 Fan 2	OK	Spinning at normal speed
	Fan Tray 1 Fan 3	OK	Spinning at normal speed
	Fan Tray 1 Fan 4	OK	Spinning at normal speed
	Fan Tray 1 Fan 5	OK	Spinning at normal speed
	Fan Tray 1 Fan 6	OK	Spinning at normal speed
	Fan Tray 1 Fan 7	OK	Spinning at normal speed
	Fan Tray 1 Fan 8	OK	Spinning at normal speed
	Fan Tray 1 Fan 9	OK	Spinning at normal speed
	Fan Tray 1 Fan 10	OK	Spinning at normal speed
	Fan Tray 1 Fan 11	OK	Spinning at normal speed
	Fan Tray 1 Fan 12	OK	Spinning at normal speed
	Fan Tray 1 Fan 13	OK	Spinning at normal speed
	Fan Tray 1 Fan 14	OK	Spinning at normal speed

Fan Tray 1 Fan 15	OK	Spinning at normal speed
Fan Tray 1 Fan 16	OK	Spinning at normal speed
Fan Tray 1 Fan 17	OK	Spinning at normal speed
Fan Tray 1 Fan 18	OK	Spinning at normal speed
Fan Tray 1 Fan 19	OK	Spinning at normal speed
Fan Tray 1 Fan 20	OK	Spinning at normal speed
SIB 0 Intake-A Temp Sensor	OK	20 degrees C / 68 degrees F
SIB 0 Intake-B Temp Sensor	OK	20 degrees C / 68 degrees F
SIB 0 Intake-C Temp Sensor	OK	16 degrees C / 60 degrees F
SIB 0 Exhaust-A Temp Sensor	OK	28 degrees C / 82 degrees F
SIB 0 Exhaust-B Temp Sensor	OK	28 degrees C / 82 degrees F
SIB 0 Exhaust-C Temp Sensor	OK	23 degrees C / 73 degrees F
SIB 0 PF0 Temp Sensor	OK	30 degrees C / 86 degrees F
SIB 0 PF1 Temp Sensor	OK	30 degrees C / 86 degrees F
SIB 0 PF2 Temp Sensor	OK	31 degrees C / 87 degrees F
SIB 0 PF3 Temp Sensor	OK	32 degrees C / 89 degrees F
SIB 0 PF4 Temp Sensor	OK	27 degrees C / 80 degrees F
SIB 0 PF5 Temp Sensor	OK	26 degrees C / 78 degrees F
SIB 1 Intake-A Temp Sensor	OK	22 degrees C / 71 degrees F
SIB 1 Intake-B Temp Sensor	OK	22 degrees C / 71 degrees F
SIB 1 Intake-C Temp Sensor	OK	16 degrees C / 60 degrees F
SIB 1 Exhaust-A Temp Sensor	OK	29 degrees C / 84 degrees F
SIB 1 Exhaust-B Temp Sensor	OK	31 degrees C / 87 degrees F
SIB 1 Exhaust-C Temp Sensor	OK	23 degrees C / 73 degrees F
SIB 1 PF0 Temp Sensor	OK	32 degrees C / 89 degrees F
SIB 1 PF1 Temp Sensor	OK	31 degrees C / 87 degrees F
SIB 1 PF2 Temp Sensor	OK	33 degrees C / 91 degrees F
SIB 1 PF3 Temp Sensor	OK	38 degrees C / 100 degrees F
SIB 1 PF4 Temp Sensor	OK	28 degrees C / 82 degrees F
SIB 1 PF5 Temp Sensor	OK	26 degrees C / 78 degrees F
SIB 2 Intake-A Temp Sensor	OK	24 degrees C / 75 degrees F
SIB 2 Intake-B Temp Sensor	OK	21 degrees C / 69 degrees F
SIB 2 Intake-C Temp Sensor	OK	16 degrees C / 60 degrees F
SIB 2 Exhaust-A Temp Sensor	OK	28 degrees C / 82 degrees F
SIB 2 Exhaust-B Temp Sensor	OK	32 degrees C / 89 degrees F
SIB 2 Exhaust-C Temp Sensor	OK	23 degrees C / 73 degrees F
SIB 2 PF0 Temp Sensor	OK	31 degrees C / 87 degrees F
SIB 2 PF1 Temp Sensor	OK	30 degrees C / 86 degrees F
SIB 2 PF2 Temp Sensor	OK	33 degrees C / 91 degrees F
SIB 2 PF3 Temp Sensor	OK	41 degrees C / 105 degrees F
SIB 2 PF4 Temp Sensor	OK	27 degrees C / 80 degrees F
SIB 2 PF5 Temp Sensor	OK	26 degrees C / 78 degrees F
SIB 3 Intake-A Temp Sensor	OK	22 degrees C / 71 degrees F
SIB 3 Intake-B Temp Sensor	OK	23 degrees C / 73 degrees F
SIB 3 Intake-C Temp Sensor	OK	16 degrees C / 60 degrees F
SIB 3 Exhaust-A Temp Sensor	OK	29 degrees C / 84 degrees F
SIB 3 Exhaust-B Temp Sensor	OK	31 degrees C / 87 degrees F
SIB 3 Exhaust-C Temp Sensor	OK	24 degrees C / 75 degrees F
SIB 3 PF0 Temp Sensor	OK	32 degrees C / 89 degrees F
SIB 3 PF1 Temp Sensor	OK	30 degrees C / 86 degrees F
SIB 3 PF2 Temp Sensor	OK	31 degrees C / 87 degrees F
SIB 3 PF3 Temp Sensor	OK	39 degrees C / 102 degrees F
SIB 3 PF4 Temp Sensor	OK	27 degrees C / 80 degrees F
SIB 3 PF5 Temp Sensor	OK	26 degrees C / 78 degrees F
SIB 4 Intake-A Temp Sensor	OK	22 degrees C / 71 degrees F
SIB 4 Intake-B Temp Sensor	OK	25 degrees C / 77 degrees F
SIB 4 Intake-C Temp Sensor	OK	16 degrees C / 60 degrees F
SIB 4 Exhaust-A Temp Sensor	OK	29 degrees C / 84 degrees F
SIB 4 Exhaust-B Temp Sensor	OK	32 degrees C / 89 degrees F
SIB 4 Exhaust-C Temp Sensor	OK	23 degrees C / 73 degrees F

SIB 4 PF0 Temp Sensor	OK	32 degrees C / 89 degrees F
SIB 4 PF1 Temp Sensor	OK	31 degrees C / 87 degrees F
SIB 4 PF2 Temp Sensor	OK	32 degrees C / 89 degrees F
SIB 4 PF3 Temp Sensor	OK	40 degrees C / 104 degrees F
SIB 4 PF4 Temp Sensor	OK	26 degrees C / 78 degrees F
SIB 4 PF5 Temp Sensor	OK	25 degrees C / 77 degrees F
SIB 5 Intake-A Temp Sensor	OK	21 degrees C / 69 degrees F
SIB 5 Intake-B Temp Sensor	OK	20 degrees C / 68 degrees F
SIB 5 Intake-C Temp Sensor	OK	16 degrees C / 60 degrees F
SIB 5 Exhaust-A Temp Sensor	OK	27 degrees C / 80 degrees F
SIB 5 Exhaust-B Temp Sensor	OK	27 degrees C / 80 degrees F
SIB 5 Exhaust-C Temp Sensor	OK	23 degrees C / 73 degrees F
SIB 5 PF0 Temp Sensor	OK	30 degrees C / 86 degrees F
SIB 5 PF1 Temp Sensor	OK	29 degrees C / 84 degrees F
SIB 5 PF2 Temp Sensor	OK	30 degrees C / 86 degrees F
SIB 5 PF3 Temp Sensor	OK	32 degrees C / 89 degrees F
SIB 5 PF4 Temp Sensor	OK	28 degrees C / 82 degrees F
SIB 5 PF5 Temp Sensor	OK	27 degrees C / 80 degrees F

### show chassis environment (ACX2000 Universal Metro Router)

```
user@host> show chassis environment
```

Class	Item	Status	Measurement
	PCB Left	OK	44 degrees C / 111 degrees F
	SFP+ Xcvr	OK	50 degrees C / 122 degrees F
	FEB	OK	70 degrees C / 158 degrees F
	PCB Up	OK	63 degrees C / 145 degrees F
	PCB Mid	OK	66 degrees C / 150 degrees F
	Telecom Mod	OK	65 degrees C / 149 degrees F
	Routing Engine	OK	54 degrees C / 129 degrees F
	Heater off		

### show chassis environment (ACX4000 Universal Metro Router)

On the ACX4000 router, the MIC output of the **show chassis environment** command varies depending on the number of temperature channels present in the installed MIC.

```
user@host> show chassis environment
```

Class	Item	Status	Measurement
Temp	PEM 0	OK	33 degrees C / 91 degrees F
	PEM 1	Absent	
	PCB Bottom	OK	30 degrees C / 86 degrees F
	PCB Middle	OK	34 degrees C / 93 degrees F
	BCM56445	OK	33 degrees C / 91 degrees F
	SFP+ Xcvr	OK	32 degrees C / 89 degrees F
	Fan tray inlet	OK	39 degrees C / 102 degrees F
	Exhaust	OK	30 degrees C / 86 degrees F
	Routing Engine	OK	32 degrees C / 89 degrees F
	Heater off		
Pic	PIC 0/0 Channel 0	OK	28 degrees C / 82 degrees F
	PIC 0/0 Channel 1	OK	29 degrees C / 84 degrees F
	PIC 0/0 Channel 2	OK	0 degrees C / 32 degrees F
	PIC 0/0 Channel 3	OK	0 degrees C / 32 degrees F
	PIC 0/0 Channel 4	OK	0 degrees C / 32 degrees F
	PIC 0/0 Channel 5	OK	0 degrees C / 32 degrees F
	PIC 0/0 Channel 6	OK	0 degrees C / 32 degrees F

	PIC 0/0 Channel 7	OK	0 degrees C / 32 degrees F
	PIC 0/0 Channel 8	OK	0 degrees C / 32 degrees F
	PIC 0/0 Channel 9	OK	0 degrees C / 32 degrees F
	PIC 1/0 Channel 0	OK	33 degrees C / 91 degrees F
	PIC 1/0 Channel 1	OK	31 degrees C / 87 degrees F
	PIC 1/0 Channel 2	OK	30 degrees C / 86 degrees F
	PIC 1/0 Channel 3	OK	0 degrees C / 32 degrees F
	PIC 1/0 Channel 4	OK	0 degrees C / 32 degrees F
	PIC 1/0 Channel 5	OK	0 degrees C / 32 degrees F
	PIC 1/0 Channel 6	OK	0 degrees C / 32 degrees F
	PIC 1/0 Channel 7	OK	0 degrees C / 32 degrees F
	PIC 1/0 Channel 8	OK	0 degrees C / 32 degrees F
	PIC 1/1 Channel 0	OK	31 degrees C / 87 degrees F
	PIC 1/1 Channel 1	OK	29 degrees C / 84 degrees F
	PIC 1/1 Channel 2	OK	28 degrees C / 82 degrees F
	PIC 1/1 Channel 3	OK	0 degrees C / 32 degrees F
	PIC 1/1 Channel 4	OK	0 degrees C / 32 degrees F
	PIC 1/1 Channel 5	OK	0 degrees C / 32 degrees F
	PIC 1/1 Channel 6	OK	0 degrees C / 32 degrees F
	PIC 1/1 Channel 7	OK	0 degrees C / 32 degrees F
	PIC 1/1 Channel 8	OK	0 degrees C / 32 degrees F
Fans	Fan 1	OK	Spinning at normal speed
	Fan 2	OK	Spinning at normal speed

### show chassis environment (ACX5048 Router)

```
user@host> show chassis environment
```

Class	Item	Status	Measurement
Power	FPC 0 Power Supply 0	Absent	
	FPC 0 Power Supply 1	OK	
Temp	FPC 0 Sensor TopMiddle E	OK	23 degrees C / 73 degrees F
	FPC 0 Sensor TopRight C	OK	18 degrees C / 64 degrees F
	FPC 0 Sensor TopLeft C	OK	21 degrees C / 69 degrees F
	FPC 0 Sensor TopRight E	OK	20 degrees C / 68 degrees F
	FPC 0 Sensor CPURight C	OK	23 degrees C / 73 degrees F
	FPC 0 Sensor CPULeft E	OK	22 degrees C / 71 degrees F
	FPC 0 Sensor CPU Die Temp	OK	39 degrees C / 102 degrees F
Fans	FPC 0 Fan Tray 0	OK	Spinning at normal speed
	FPC 0 Fan Tray 1	OK	Spinning at normal speed
	FPC 0 Fan Tray 2	OK	Spinning at normal speed
	FPC 0 Fan Tray 3	OK	Spinning at normal speed
	FPC 0 Fan Tray 4	OK	Spinning at normal speed

### show chassis environment (ACX5096 Router)

```
user@host> show chassis environment
```

Class	Item	Status	Measurement
Power	FPC 0 Power Supply 0	OK	
	FPC 0 Power Supply 1	OK	
Temp	FPC 0 Sensor TopMiddle E	OK	32 degrees C / 89 degrees F
	FPC 0 Sensor TopRight I	OK	29 degrees C / 84 degrees F
	FPC 0 Sensor TopLeft I	OK	23 degrees C / 73 degrees F
	FPC 0 Sensor TopRight E	OK	28 degrees C / 82 degrees F
	FPC 0 Sensor CPURight I	OK	30 degrees C / 86 degrees F
	FPC 0 Sensor CPULeft I	OK	29 degrees C / 84 degrees F

	FPC 0 Sensor Die Temp	OK	46 degrees C / 114 degrees F
	FPC 0 Mezz Temp	OK	23 degrees C / 73 degrees F
Fans	FPC 0 Fan Tray 0	OK	Spinning at normal speed
	FPC 0 Fan Tray 1	OK	Spinning at normal speed
	FPC 0 Fan Tray 2	OK	Spinning at normal speed

### show chassis environment (ACX500 Router)

user@host> show chassis environment

Class	Item	Status	Measurement
	Power Mod	OK	47 degrees C / 116 degrees F
	BCM54610	OK	46 degrees C / 114 degrees F
	DPLL31404	OK	45 degrees C / 113 degrees F
	CPLD	OK	42 degrees C / 107 degrees F
	1588-FPGA	OK	43 degrees C / 109 degrees F
	NPU	OK	62 degrees C / 143 degrees F
	MAC sensor 1	OK	40 degrees C / 104 degrees F
	MAC sensor 2	OK	38 degrees C / 100 degrees F
	SFP PHY	OK	38 degrees C / 100 degrees F
	Combo/RJ45 PHY	OK	37 degrees C / 98 degrees F
	SFP sensor 1	OK	35 degrees C / 95 degrees F
	SFP sensor 2	OK	33 degrees C / 91 degrees F
	SFP sensor 3	OK	32 degrees C / 89 degrees F
	Routing Engine	OK	54 degrees C / 129 degrees F
	Heater off		

## show chassis environment adc

<b>Syntax</b>	<pre>show chassis environment adc &lt;adc-slot-number&gt; &lt;all-members&gt; &lt;local&gt; &lt;member member-id&gt;</pre>
<b>Release Information</b>	<p>Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.</p> <p><b>all-members</b>, <b>local</b>, and <b>member member-id</b> options introduced in Junos OS Release 15.1 for MX2020 and MX2010 routers.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p>
<b>Description</b>	Display chassis environmental information about the adapter cards.
<b>Options</b>	<p><b>none</b>—Display environmental information about all adapter cards.</p> <p><b>adc-slot-number</b>—(Optional) Display environmental information about the specified adapter card. For MX2020 routers, replace <b>adc-slot-number</b> with a value of <b>0</b> through <b>19</b>. For MX2010 and MX2008 routers, replace <b>adc-slot-number</b> with a value of <b>0</b> through <b>9</b>.</p> <p><b>all-members</b>—(Optional) Display chassis environmental information about the adapter cards (ADCs) in all members of the Virtual Chassis configuration.</p> <p><b>local</b>—(Optional) Display chassis environmental information about the ADCs in the local member of the Virtual Chassis.</p> <p><b>member member-id</b>—(Optional) Display chassis environmental information about the ADCs in the specified member of the Virtual Chassis. Replace <b>member-id</b> with the value <b>0</b> or <b>1</b>.</p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">show chassis adc on page 920</a></li> </ul>
<b>List of Sample Output</b>	<p><a href="#">show chassis environment adc (MX2020 Router) on page 1055</a></p> <p><a href="#">show chassis environment adc (MX2010 Router) on page 1061</a></p> <p><a href="#">show chassis environment adc (MX2008 Router) on page 1064</a></p>
<b>Output Fields</b>	<p><a href="#">Table 98 on page 1055</a> lists the output fields for the <b>show chassis environment adc</b> command. Output fields are listed in the approximate order in which they appear.</p>



Table 98: show chassis environment adc Output Fields

Field Name	Field Description
<b>State</b>	Status of the adapter card. <ul style="list-style-type: none"> <li>• <b>Online</b>—The adapter card is online and running.</li> <li>• <b>Offline</b>—Adapter card is powered down.</li> </ul>
<b>Temperature</b>	Temperature in Celsius (C) and Fahrenheit (F) of the air flowing past the adapter card. <ul style="list-style-type: none"> <li>• <b>Intake Temperature</b>—Measures the temperature of the air intake.</li> <li>• <b>Exhaust Temperature</b>—Measures the temperature of the hot air exhaust.</li> <li>• <b>ADC-XF1</b>—Measures the temperature of the ADC chipset, ADC-XF1.</li> <li>• <b>ADC-XF0</b>—Measures the temperature of the ADC chipset, ADC-XF0.</li> </ul>
<b>Power</b>	Power required and measured on the adapter card. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.

## Sample Output

### show chassis environment adc (MX2020 Router)

```

user@host> show chassis environment adc

ADC 0 status:
  State           Online
  Intake Temperature 39 degrees C / 102 degrees F
  Exhaust Temperature 50 degrees C / 122 degrees F
  ADC-XF1 Temperature 58 degrees C / 136 degrees F
  ADC-XF0 Temperature 64 degrees C / 147 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL 1029 mV
    LTC3880-XF0-1.0v-CH0 1029 mV
    LTC3880-XF0-1.0v-CH1 1033 mV
    LTC3880-XF0-1.5v-RAIL 1499 mV
    LTC3880-XF0-1.5v-CH0 1499 mV
    LTC3880-XF0-1.5v-CH1 1501 mV
    LTC3880-XF1-1.0v-RAIL 1029 mV
    LTC3880-XF1-1.0v-CH0 1029 mV
    LTC3880-XF1-1.0v-CH1 1033 mV
    LTC3880-XF1-1.5v-RAIL 1499 mV
    LTC3880-XF1-1.5v-CH0 1499 mV
    LTC3880-XF1-1.5v-CH1 1502 mV
  ADC 1 status:
    State           Online
    Intake Temperature 38 degrees C / 100 degrees F
    Exhaust Temperature 48 degrees C / 118 degrees F
    ADC-XF1 Temperature 59 degrees C / 138 degrees F
    ADC-XF0 Temperature 61 degrees C / 141 degrees F
    Power
      LTC3880-XF0-1.0v-RAIL 1029 mV
      LTC3880-XF0-1.0v-CH0 1029 mV
      LTC3880-XF0-1.0v-CH1 1033 mV
      LTC3880-XF0-1.5v-RAIL 1500 mV
      LTC3880-XF0-1.5v-CH0 1500 mV
      LTC3880-XF0-1.5v-CH1 1501 mV

```

```

LTC3880-XF1-1.0v-RAIL    1029 mV
LTC3880-XF1-1.0v-CH0     1029 mV
LTC3880-XF1-1.0v-CH1     1033 mV
LTC3880-XF1-1.5v-RAIL    1500 mV
LTC3880-XF1-1.5v-CH0     1500 mV
LTC3880-XF1-1.5v-CH1     1502 mV
ADC 2 status:
State                     Online
Intake Temperature        36 degrees C / 96 degrees F
Exhaust Temperature       50 degrees C / 122 degrees F
ADC-XF1 Temperature       52 degrees C / 125 degrees F
ADC-XF0 Temperature       59 degrees C / 138 degrees F
Power
LTC3880-XF0-1.0v-RAIL    1030 mV
LTC3880-XF0-1.0v-CH0     1030 mV
LTC3880-XF0-1.0v-CH1     1033 mV
LTC3880-XF0-1.5v-CH0     1499 mV
LTC3880-XF1-1.0v-RAIL    1029 mV
LTC3880-XF1-1.0v-CH0     1029 mV
LTC3880-XF1-1.0v-CH1     1033 mV
LTC3880-XF1-1.5v-CH0     1500 mV
ADC 3 status:
State                     Online
Intake Temperature        39 degrees C / 102 degrees F
Exhaust Temperature       50 degrees C / 122 degrees F
ADC-XF1 Temperature       61 degrees C / 141 degrees F
ADC-XF0 Temperature       63 degrees C / 145 degrees F
Power
LTC3880-XF0-1.0v-RAIL    1030 mV
LTC3880-XF0-1.0v-CH0     1030 mV
LTC3880-XF0-1.0v-CH1     1033 mV
LTC3880-XF0-1.5v-RAIL    1500 mV
LTC3880-XF0-1.5v-CH0     1500 mV
LTC3880-XF0-1.5v-CH1     1501 mV
LTC3880-XF1-1.0v-RAIL    1029 mV
LTC3880-XF1-1.0v-CH0     1029 mV
LTC3880-XF1-1.0v-CH1     1033 mV
LTC3880-XF1-1.5v-RAIL    1500 mV
LTC3880-XF1-1.5v-CH0     1500 mV
LTC3880-XF1-1.5v-CH1     1502 mV
ADC 4 status:
State                     Online
Intake Temperature        38 degrees C / 100 degrees F
Exhaust Temperature       49 degrees C / 120 degrees F
ADC-XF1 Temperature       60 degrees C / 140 degrees F
ADC-XF0 Temperature       62 degrees C / 143 degrees F
Power
LTC3880-XF0-1.0v-RAIL    1029 mV
LTC3880-XF0-1.0v-CH0     1029 mV
LTC3880-XF0-1.0v-CH1     1033 mV
LTC3880-XF0-1.5v-RAIL    1500 mV
LTC3880-XF0-1.5v-CH0     1500 mV
LTC3880-XF0-1.5v-CH1     1501 mV
LTC3880-XF1-1.0v-RAIL    1029 mV
LTC3880-XF1-1.0v-CH0     1029 mV
LTC3880-XF1-1.0v-CH1     1033 mV
LTC3880-XF1-1.5v-RAIL    1500 mV
LTC3880-XF1-1.5v-CH0     1500 mV
LTC3880-XF1-1.5v-CH1     1502 mV
ADC 5 status:

```

```

State
Intake Temperature      Online
                        37 degrees C / 98 degrees F
Exhaust Temperature     52 degrees C / 125 degrees F
ADC-XF1 Temperature     55 degrees C / 131 degrees F
ADC-XF0 Temperature     66 degrees C / 150 degrees F
Power
  LTC3880-XF0-1.0v-RAIL 1029 mV
  LTC3880-XF0-1.0v-CH0  1029 mV
  LTC3880-XF0-1.0v-CH1  1033 mV
  LTC3880-XF0-1.5v-CH0  1500 mV
  LTC3880-XF1-1.0v-RAIL 1030 mV
  LTC3880-XF1-1.0v-CH0  1030 mV
  LTC3880-XF1-1.0v-CH1  1033 mV
  LTC3880-XF1-1.5v-CH0  1500 mV
ADC 6 status:
State
Intake Temperature      Online
                        39 degrees C / 102 degrees F
Exhaust Temperature     51 degrees C / 123 degrees F
ADC-XF1 Temperature     58 degrees C / 136 degrees F
ADC-XF0 Temperature     64 degrees C / 147 degrees F
Power
  LTC3880-XF0-1.0v-RAIL 1029 mV
  LTC3880-XF0-1.0v-CH0  1029 mV
  LTC3880-XF0-1.0v-CH1  1033 mV
  LTC3880-XF0-1.5v-RAIL 1499 mV
  LTC3880-XF0-1.5v-CH0  1499 mV
  LTC3880-XF0-1.5v-CH1  1501 mV
  LTC3880-XF1-1.0v-RAIL 1029 mV
  LTC3880-XF1-1.0v-CH0  1029 mV
  LTC3880-XF1-1.0v-CH1  1033 mV
  LTC3880-XF1-1.5v-RAIL 1499 mV
  LTC3880-XF1-1.5v-CH0  1499 mV
  LTC3880-XF1-1.5v-CH1  1502 mV
ADC 7 status:
State
Intake Temperature      Online
                        38 degrees C / 100 degrees F
Exhaust Temperature     52 degrees C / 125 degrees F
ADC-XF1 Temperature     61 degrees C / 141 degrees F
ADC-XF0 Temperature     69 degrees C / 156 degrees F
Power
  LTC3880-XF0-1.0v-RAIL 1029 mV
  LTC3880-XF0-1.0v-CH0  1029 mV
  LTC3880-XF0-1.0v-CH1  1033 mV
  LTC3880-XF0-1.5v-CH0  1499 mV
  LTC3880-XF1-1.0v-RAIL 1029 mV
  LTC3880-XF1-1.0v-CH0  1029 mV
  LTC3880-XF1-1.0v-CH1  1033 mV
  LTC3880-XF1-1.5v-CH0  1500 mV
ADC 8 status:
State
Intake Temperature      Online
                        38 degrees C / 100 degrees F
Exhaust Temperature     50 degrees C / 122 degrees F
ADC-XF1 Temperature     63 degrees C / 145 degrees F
ADC-XF0 Temperature     64 degrees C / 147 degrees F
Power
  LTC3880-XF0-1.0v-RAIL 1029 mV
  LTC3880-XF0-1.0v-CH0  1029 mV
  LTC3880-XF0-1.0v-CH1  1033 mV
  LTC3880-XF0-1.5v-RAIL 1499 mV
  LTC3880-XF0-1.5v-CH0  1499 mV

```

LTC3880-XF0-1.5v-CH1	1501 mV
LTC3880-XF1-1.0v-RAIL	1030 mV
LTC3880-XF1-1.0v-CH0	1030 mV
LTC3880-XF1-1.0v-CH1	1033 mV
LTC3880-XF1-1.5v-RAIL	1499 mV
LTC3880-XF1-1.5v-CH0	1499 mV
LTC3880-XF1-1.5v-CH1	1502 mV
ADC 9 status:	
State	Online
Intake Temperature	40 degrees C / 104 degrees F
Exhaust Temperature	50 degrees C / 122 degrees F
ADC-XF1 Temperature	59 degrees C / 138 degrees F
ADC-XF0 Temperature	62 degrees C / 143 degrees F
Power	
LTC3880-XF0-1.0v-RAIL	1029 mV
LTC3880-XF0-1.0v-CH0	1029 mV
LTC3880-XF0-1.0v-CH1	1033 mV
LTC3880-XF0-1.5v-RAIL	1500 mV
LTC3880-XF0-1.5v-CH0	1500 mV
LTC3880-XF0-1.5v-CH1	1501 mV
LTC3880-XF1-1.0v-RAIL	1029 mV
LTC3880-XF1-1.0v-CH0	1029 mV
LTC3880-XF1-1.0v-CH1	1033 mV
LTC3880-XF1-1.5v-RAIL	1499 mV
LTC3880-XF1-1.5v-CH0	1499 mV
LTC3880-XF1-1.5v-CH1	1502 mV
ADC 10 status:	
State	Online
Intake Temperature	46 degrees C / 114 degrees F
Exhaust Temperature	52 degrees C / 125 degrees F
ADC-XF1 Temperature	66 degrees C / 150 degrees F
ADC-XF0 Temperature	65 degrees C / 149 degrees F
Power	
LTC3880-XF0-1.0v-RAIL	1030 mV
LTC3880-XF0-1.0v-CH0	1030 mV
LTC3880-XF0-1.0v-CH1	1033 mV
LTC3880-XF0-1.5v-RAIL	1499 mV
LTC3880-XF0-1.5v-CH0	1499 mV
LTC3880-XF0-1.5v-CH1	1501 mV
LTC3880-XF1-1.0v-RAIL	1029 mV
LTC3880-XF1-1.0v-CH0	1029 mV
LTC3880-XF1-1.0v-CH1	1033 mV
LTC3880-XF1-1.5v-RAIL	1500 mV
LTC3880-XF1-1.5v-CH0	1500 mV
LTC3880-XF1-1.5v-CH1	1502 mV
ADC 11 status:	
State	Online
Intake Temperature	47 degrees C / 116 degrees F
Exhaust Temperature	53 degrees C / 127 degrees F
ADC-XF1 Temperature	64 degrees C / 147 degrees F
ADC-XF0 Temperature	65 degrees C / 149 degrees F
Power	
LTC3880-XF0-1.0v-RAIL	1030 mV
LTC3880-XF0-1.0v-CH0	1030 mV
LTC3880-XF0-1.0v-CH1	1033 mV
LTC3880-XF0-1.5v-RAIL	1500 mV
LTC3880-XF0-1.5v-CH0	1500 mV
LTC3880-XF0-1.5v-CH1	1501 mV
LTC3880-XF1-1.0v-RAIL	1029 mV
LTC3880-XF1-1.0v-CH0	1029 mV

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LTC3880-XF1-1.0v-CH1      1033 mV
LTC3880-XF1-1.5v-RAIL     1499 mV
LTC3880-XF1-1.5v-CH0      1499 mV
LTC3880-XF1-1.5v-CH1      1502 mV
ADC 12 status:
State                      Online
Intake Temperature         48 degrees C / 118 degrees F
Exhaust Temperature        54 degrees C / 129 degrees F
ADC-XF1 Temperature        66 degrees C / 150 degrees F
ADC-XF0 Temperature        65 degrees C / 149 degrees F
Power
LTC3880-XF0-1.0v-RAIL     1029 mV
LTC3880-XF0-1.0v-CH0      1029 mV
LTC3880-XF0-1.0v-CH1      1033 mV
LTC3880-XF0-1.5v-RAIL     1500 mV
LTC3880-XF0-1.5v-CH0      1500 mV
LTC3880-XF0-1.5v-CH1      1501 mV
LTC3880-XF1-1.0v-RAIL     1029 mV
LTC3880-XF1-1.0v-CH0      1029 mV
LTC3880-XF1-1.0v-CH1      1033 mV
LTC3880-XF1-1.5v-RAIL     1499 mV
LTC3880-XF1-1.5v-CH0      1499 mV
LTC3880-XF1-1.5v-CH1      1502 mV
ADC 13 status:
State                      Online
Intake Temperature         48 degrees C / 118 degrees F
Exhaust Temperature        55 degrees C / 131 degrees F
ADC-XF1 Temperature        66 degrees C / 150 degrees F
ADC-XF0 Temperature        67 degrees C / 152 degrees F
Power
LTC3880-XF0-1.0v-RAIL     1029 mV
LTC3880-XF0-1.0v-CH0      1029 mV
LTC3880-XF0-1.0v-CH1      1033 mV
LTC3880-XF0-1.5v-RAIL     1500 mV
LTC3880-XF0-1.5v-CH0      1500 mV
LTC3880-XF0-1.5v-CH1      1501 mV
LTC3880-XF1-1.0v-RAIL     1030 mV
LTC3880-XF1-1.0v-CH0      1030 mV
LTC3880-XF1-1.0v-CH1      1034 mV
LTC3880-XF1-1.5v-RAIL     1500 mV
LTC3880-XF1-1.5v-CH0      1500 mV
LTC3880-XF1-1.5v-CH1      1503 mV
ADC 14 status:
State                      Online
Intake Temperature         50 degrees C / 122 degrees F
Exhaust Temperature        57 degrees C / 134 degrees F
ADC-XF1 Temperature        68 degrees C / 154 degrees F
ADC-XF0 Temperature        72 degrees C / 161 degrees F
Power
LTC3880-XF0-1.0v-RAIL     1030 mV
LTC3880-XF0-1.0v-CH0      1030 mV
LTC3880-XF0-1.0v-CH1      1034 mV
LTC3880-XF0-1.5v-RAIL     1499 mV
LTC3880-XF0-1.5v-CH0      1499 mV
LTC3880-XF0-1.5v-CH1      1501 mV
LTC3880-XF1-1.0v-RAIL     1030 mV
LTC3880-XF1-1.0v-CH0      1030 mV
LTC3880-XF1-1.0v-CH1      1034 mV
LTC3880-XF1-1.5v-RAIL     1499 mV
LTC3880-XF1-1.5v-CH0      1499 mV

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    LTC3880-XF1-1.5v-CH1      1502 mV
ADC 15 status:
  State                       Online
  Intake Temperature          49 degrees C / 120 degrees F
  Exhaust Temperature         56 degrees C / 132 degrees F
  ADC-XF1 Temperature         68 degrees C / 154 degrees F
  ADC-XF0 Temperature         68 degrees C / 154 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL     1030 mV
    LTC3880-XF0-1.0v-CH0      1030 mV
    LTC3880-XF0-1.0v-CH1      1034 mV
    LTC3880-XF0-1.5v-RAIL     1499 mV
    LTC3880-XF0-1.5v-CH0      1499 mV
    LTC3880-XF0-1.5v-CH1      1501 mV
    LTC3880-XF1-1.0v-RAIL     1030 mV
    LTC3880-XF1-1.0v-CH0      1030 mV
    LTC3880-XF1-1.0v-CH1      1034 mV
    LTC3880-XF1-1.5v-RAIL     1499 mV
    LTC3880-XF1-1.5v-CH0      1499 mV
    LTC3880-XF1-1.5v-CH1      1502 mV
ADC 16 status:
  State                       Online
  Intake Temperature          51 degrees C / 123 degrees F
  Exhaust Temperature         56 degrees C / 132 degrees F
  ADC-XF1 Temperature         67 degrees C / 152 degrees F
  ADC-XF0 Temperature         68 degrees C / 154 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL     1029 mV
    LTC3880-XF0-1.0v-CH0      1029 mV
    LTC3880-XF0-1.0v-CH1      1033 mV
    LTC3880-XF0-1.5v-RAIL     1499 mV
    LTC3880-XF0-1.5v-CH0      1499 mV
    LTC3880-XF0-1.5v-CH1      1501 mV
    LTC3880-XF1-1.0v-RAIL     1029 mV
    LTC3880-XF1-1.0v-CH0      1029 mV
    LTC3880-XF1-1.0v-CH1      1033 mV
    LTC3880-XF1-1.5v-RAIL     1500 mV
    LTC3880-XF1-1.5v-CH0      1500 mV
    LTC3880-XF1-1.5v-CH1      1502 mV
ADC 17 status:
  State                       Online
  Intake Temperature          51 degrees C / 123 degrees F
  Exhaust Temperature         56 degrees C / 132 degrees F
  ADC-XF1 Temperature         68 degrees C / 154 degrees F
  ADC-XF0 Temperature         69 degrees C / 156 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL     1030 mV
    LTC3880-XF0-1.0v-CH0      1030 mV
    LTC3880-XF0-1.0v-CH1      1033 mV
    LTC3880-XF0-1.5v-RAIL     1500 mV
    LTC3880-XF0-1.5v-CH0      1500 mV
    LTC3880-XF0-1.5v-CH1      1501 mV
    LTC3880-XF1-1.0v-RAIL     1030 mV
    LTC3880-XF1-1.0v-CH0      1030 mV
    LTC3880-XF1-1.0v-CH1      1034 mV
    LTC3880-XF1-1.5v-RAIL     1500 mV
    LTC3880-XF1-1.5v-CH0      1500 mV
    LTC3880-XF1-1.5v-CH1      1502 mV
ADC 18 status:
  State                       Online

```

```

Intake Temperature      52 degrees C / 125 degrees F
Exhaust Temperature    57 degrees C / 134 degrees F
ADC-XF1 Temperature    66 degrees C / 150 degrees F
ADC-XF0 Temperature    71 degrees C / 159 degrees F
Power
  LTC3880-XF0-1.0v-RAIL 1030 mV
  LTC3880-XF0-1.0v-CH0  1030 mV
  LTC3880-XF0-1.0v-CH1  1034 mV
  LTC3880-XF0-1.5v-RAIL 1499 mV
  LTC3880-XF0-1.5v-CH0  1499 mV
  LTC3880-XF0-1.5v-CH1  1501 mV
  LTC3880-XF1-1.0v-RAIL 1030 mV
  LTC3880-XF1-1.0v-CH0  1030 mV
  LTC3880-XF1-1.0v-CH1  1034 mV
  LTC3880-XF1-1.5v-RAIL 1500 mV
  LTC3880-XF1-1.5v-CH0  1500 mV
  LTC3880-XF1-1.5v-CH1  1502 mV
ADC 19 status:
State      Online
Intake Temperature    49 degrees C / 120 degrees F
Exhaust Temperature   56 degrees C / 132 degrees F
ADC-XF1 Temperature  67 degrees C / 152 degrees F
ADC-XF0 Temperature  70 degrees C / 158 degrees F
Power
  LTC3880-XF0-1.0v-RAIL 1029 mV
  LTC3880-XF0-1.0v-CH0  1029 mV
  LTC3880-XF0-1.0v-CH1  1033 mV
  LTC3880-XF0-1.5v-RAIL 1499 mV
  LTC3880-XF0-1.5v-CH0  1499 mV
  LTC3880-XF0-1.5v-CH1  1501 mV
  LTC3880-XF1-1.0v-RAIL 1030 mV
  LTC3880-XF1-1.0v-CH0  1030 mV
  LTC3880-XF1-1.0v-CH1  1033 mV
  LTC3880-XF1-1.5v-RAIL 1500 mV
  LTC3880-XF1-1.5v-CH0  1500 mV
  LTC3880-XF1-1.5v-CH1  1502 mV

```

### show chassis environment adc (MX2010 Router)

```
user@host> show chassis environment adc
```

```

ADC 0 status:
State      Online
Intake Temperature    33 degrees C / 91 degrees F
Exhaust Temperature   42 degrees C / 107 degrees F
ADC-XF1 Temperature  46 degrees C / 114 degrees F
ADC-XF0 Temperature  53 degrees C / 127 degrees F
Power
  LTC3880-XF0-1.0v-RAIL 998 mV
  LTC3880-XF0-1.0v-CH0  998 mV
  LTC3880-XF0-1.0v-CH1 1001 mV
  LTC3880-XF0-1.5v-RAIL 1454 mV
  LTC3880-XF0-1.5v-CH0  1454 mV
  LTC3880-XF0-1.5v-CH1  1456 mV
  LTC3880-XF1-1.0v-RAIL 998 mV
  LTC3880-XF1-1.0v-CH0  998 mV
  LTC3880-XF1-1.0v-CH1 1002 mV
  LTC3880-XF1-1.5v-RAIL 1454 mV
  LTC3880-XF1-1.5v-CH0  1454 mV
  LTC3880-XF1-1.5v-CH1  1457 mV

```

## ADC 1 status:

State	Online
Intake Temperature	32 degrees C / 89 degrees F
Exhaust Temperature	42 degrees C / 107 degrees F
ADC-XF1 Temperature	44 degrees C / 111 degrees F
ADC-XF0 Temperature	52 degrees C / 125 degrees F
Power	
LTC3880-XF0-1.0v-RAIL	998 mV
LTC3880-XF0-1.0v-CH0	998 mV
LTC3880-XF0-1.0v-CH1	1002 mV
LTC3880-XF0-1.5v-RAIL	1454 mV
LTC3880-XF0-1.5v-CH0	1454 mV
LTC3880-XF0-1.5v-CH1	1456 mV
LTC3880-XF1-1.0v-RAIL	999 mV
LTC3880-XF1-1.0v-CH0	999 mV
LTC3880-XF1-1.0v-CH1	1002 mV
LTC3880-XF1-1.5v-RAIL	1454 mV
LTC3880-XF1-1.5v-CH0	1454 mV
LTC3880-XF1-1.5v-CH1	1456 mV

## ADC 2 status:

State	Online
Intake Temperature	35 degrees C / 95 degrees F
Exhaust Temperature	42 degrees C / 107 degrees F
ADC-XF1 Temperature	48 degrees C / 118 degrees F
ADC-XF0 Temperature	54 degrees C / 129 degrees F
Power	
LTC3880-XF0-1.0v-RAIL	1030 mV
LTC3880-XF0-1.0v-CH0	1030 mV
LTC3880-XF0-1.0v-CH1	1033 mV
LTC3880-XF0-1.5v-RAIL	1500 mV
LTC3880-XF0-1.5v-CH0	1500 mV
LTC3880-XF0-1.5v-CH1	1501 mV
LTC3880-XF1-1.0v-RAIL	1029 mV
LTC3880-XF1-1.0v-CH0	1029 mV
LTC3880-XF1-1.0v-CH1	1033 mV
LTC3880-XF1-1.5v-RAIL	1499 mV
LTC3880-XF1-1.5v-CH0	1499 mV
LTC3880-XF1-1.5v-CH1	1502 mV

## ADC 3 status:

State	Online
Intake Temperature	35 degrees C / 95 degrees F
Exhaust Temperature	40 degrees C / 104 degrees F
ADC-XF1 Temperature	44 degrees C / 111 degrees F
ADC-XF0 Temperature	51 degrees C / 123 degrees F
Power	
LTC3880-XF0-1.0v-RAIL	999 mV
LTC3880-XF0-1.0v-CH0	999 mV
LTC3880-XF0-1.0v-CH1	1002 mV
LTC3880-XF0-1.5v-RAIL	1454 mV
LTC3880-XF0-1.5v-CH0	1454 mV
LTC3880-XF0-1.5v-CH1	1456 mV
LTC3880-XF1-1.0v-RAIL	999 mV
LTC3880-XF1-1.0v-CH0	999 mV
LTC3880-XF1-1.0v-CH1	1002 mV
LTC3880-XF1-1.5v-RAIL	1454 mV
LTC3880-XF1-1.5v-CH0	1454 mV
LTC3880-XF1-1.5v-CH1	1457 mV

## ADC 4 status:

State	Online
Intake Temperature	31 degrees C / 87 degrees F



```

Exhaust Temperature      43 degrees C / 109 degrees F
ADC-XF1 Temperature      48 degrees C / 118 degrees F
ADC-XF0 Temperature      56 degrees C / 132 degrees F
Power
  LTC3880-XF0-1.0v-RAIL  1029 mV
  LTC3880-XF0-1.0v-CH0   1029 mV
  LTC3880-XF0-1.0v-CH1   1033 mV
  LTC3880-XF0-1.5v-RAIL  1499 mV
  LTC3880-XF0-1.5v-CH0   1499 mV
  LTC3880-XF0-1.5v-CH1   1501 mV
  LTC3880-XF1-1.0v-RAIL  1030 mV
  LTC3880-XF1-1.0v-CH0   1030 mV
  LTC3880-XF1-1.0v-CH1   1033 mV
  LTC3880-XF1-1.5v-RAIL  1499 mV
  LTC3880-XF1-1.5v-CH0   1499 mV
  LTC3880-XF1-1.5v-CH1   1502 mV
ADC 5 status:
State      Online
Intake Temperature  33 degrees C / 91 degrees F
Exhaust Temperature 43 degrees C / 109 degrees F
ADC-XF1 Temperature 47 degrees C / 116 degrees F
ADC-XF0 Temperature 54 degrees C / 129 degrees F
Power
  LTC3880-XF0-1.0v-RAIL  999 mV
  LTC3880-XF0-1.0v-CH0   999 mV
  LTC3880-XF0-1.0v-CH1   1002 mV
  LTC3880-XF0-1.5v-RAIL  1454 mV
  LTC3880-XF0-1.5v-CH0   1454 mV
  LTC3880-XF0-1.5v-CH1   1456 mV
  LTC3880-XF1-1.0v-RAIL  998 mV
  LTC3880-XF1-1.0v-CH0   998 mV
  LTC3880-XF1-1.0v-CH1   1002 mV
  LTC3880-XF1-1.5v-RAIL  1454 mV
  LTC3880-XF1-1.5v-CH0   1454 mV
  LTC3880-XF1-1.5v-CH1   1457 mV
ADC 6 status:
State      Online
Intake Temperature  32 degrees C / 89 degrees F
Exhaust Temperature 42 degrees C / 107 degrees F
ADC-XF1 Temperature 47 degrees C / 116 degrees F
ADC-XF0 Temperature 55 degrees C / 131 degrees F
Power
  LTC3880-XF0-1.0v-RAIL  1030 mV
  LTC3880-XF0-1.0v-CH0   1030 mV
  LTC3880-XF0-1.0v-CH1   1033 mV
  LTC3880-XF0-1.5v-RAIL  1499 mV
  LTC3880-XF0-1.5v-CH0   1499 mV
  LTC3880-XF0-1.5v-CH1   1501 mV
  LTC3880-XF1-1.0v-RAIL  1030 mV
  LTC3880-XF1-1.0v-CH0   1030 mV
  LTC3880-XF1-1.0v-CH1   1033 mV
  LTC3880-XF1-1.5v-RAIL  1499 mV
  LTC3880-XF1-1.5v-CH0   1499 mV
  LTC3880-XF1-1.5v-CH1   1502 mV
ADC 7 status:
State      Online
Intake Temperature  36 degrees C / 96 degrees F
Exhaust Temperature 43 degrees C / 109 degrees F
ADC-XF1 Temperature 46 degrees C / 114 degrees F
ADC-XF0 Temperature 55 degrees C / 131 degrees F

```

```

Power
LTC3880-XF0-1.0v-RAIL      1030 mV
LTC3880-XF0-1.0v-CH0       1030 mV
LTC3880-XF0-1.0v-CH1       1033 mV
LTC3880-XF0-1.5v-RAIL      1500 mV
LTC3880-XF0-1.5v-CH0       1500 mV
LTC3880-XF0-1.5v-CH1       1501 mV
LTC3880-XF1-1.0v-RAIL      1030 mV
LTC3880-XF1-1.0v-CH0       1030 mV
LTC3880-XF1-1.0v-CH1       1033 mV
LTC3880-XF1-1.5v-RAIL      1499 mV
LTC3880-XF1-1.5v-CH0       1499 mV
LTC3880-XF1-1.5v-CH1       1502 mV
ADC 8 status:
State                        Online
Intake Temperature          35 degrees C / 95 degrees F
Exhaust Temperature         43 degrees C / 109 degrees F
ADC-XF1 Temperature         44 degrees C / 111 degrees F
ADC-XF0 Temperature         51 degrees C / 123 degrees F
Power
LTC3880-XF0-1.0v-RAIL      999 mV
LTC3880-XF0-1.0v-CH0       999 mV
LTC3880-XF0-1.0v-CH1       1002 mV
LTC3880-XF0-1.5v-RAIL      1455 mV
LTC3880-XF0-1.5v-CH0       1455 mV
LTC3880-XF0-1.5v-CH1       1456 mV
LTC3880-XF1-1.0v-RAIL      999 mV
LTC3880-XF1-1.0v-CH0       999 mV
LTC3880-XF1-1.0v-CH1       1002 mV
LTC3880-XF1-1.5v-RAIL      1455 mV
LTC3880-XF1-1.5v-CH0       1455 mV
LTC3880-XF1-1.5v-CH1       1457 mV
ADC 9 status:
State                        Online
Intake Temperature          31 degrees C / 87 degrees F
Exhaust Temperature         43 degrees C / 109 degrees F
ADC-XF1 Temperature         48 degrees C / 118 degrees F
ADC-XF0 Temperature         56 degrees C / 132 degrees F
Power
LTC3880-XF0-1.0v-RAIL      1029 mV
LTC3880-XF0-1.0v-CH0       1029 mV
LTC3880-XF0-1.0v-CH1       1033 mV
LTC3880-XF0-1.5v-RAIL      1455 mV
LTC3880-XF0-1.5v-CH0       1455 mV
LTC3880-XF0-1.5v-CH1       1457 mV
LTC3880-XF1-1.0v-RAIL      1029 mV
LTC3880-XF1-1.0v-CH0       1029 mV
LTC3880-XF1-1.0v-CH1       1033 mV
LTC3880-XF1-1.5v-RAIL      1454 mV
LTC3880-XF1-1.5v-CH0       1454 mV
LTC3880-XF1-1.5v-CH1       1457 mV

```

### show chassis environment adc (MX2008 Router)

```
user@host>show chassis environment adc
```

```

ADC 7 status:
State                        Online
Intake Temperature          32 degrees C / 89 degrees F
Exhaust Temperature         39 degrees C / 102 degrees F

```

ADC-XF1 Temperature	46 degrees C / 114 degrees F
ADC-XF0 Temperature	54 degrees C / 129 degrees F
Power	
LTC3880-XF0-1.0v-RAIL	1029 mV
LTC3880-XF0-1.0v-CH0	1029 mV
LTC3880-XF0-1.0v-CH1	1033 mV
LTC3880-XF0-1.5v-RAIL	1499 mV
LTC3880-XF0-1.5v-CH0	1499 mV
LTC3880-XF0-1.5v-CH1	1501 mV
LTC3880-XF1-1.0v-RAIL	1029 mV
LTC3880-XF1-1.0v-CH0	1029 mV
LTC3880-XF1-1.0v-CH1	1033 mV
LTC3880-XF1-1.5v-RAIL	1499 mV
LTC3880-XF1-1.5v-CH0	1499 mV
LTC3880-XF1-1.5v-CH1	1502 mV
ADC-2.5V	2851 mV
ADC-3.3V	3787 mV

## show chassis environment cb

**List of Syntax**

- Syntax on page 1066
- Syntax (TX Matrix Routers) on page 1066
- Syntax (TX Matrix Plus Routers) on page 1066
- Syntax (MX Series Routers) on page 1066
- Syntax (MX104 Universal Routing Platforms) on page 1066
- Syntax (MX2010, MX2020, MX10003, MX204, MX2008, and MX10008 Universal Routing Platforms) on page 1066
- Syntax (QFabric System) on page 1066
- Syntax (EX9251, EX9253 Switches) on page 1067

**Syntax** show chassis environment cb  
<slot>

**Syntax (TX Matrix Routers)** show chassis environment cb  
<lcc number | scc>  
<slot>

**Syntax (TX Matrix Plus Routers)** show chassis environment cb  
<lcc number | sfc number >  
<slot>

**Syntax (MX Series Routers)** show chassis environment cb  
<slot>  
<all-members>  
<local>  
<member member-id>

**Syntax (MX104 Universal Routing Platforms)** show chassis environment cb

**Syntax (MX2010, MX2020, MX10003, MX204, MX2008, and MX10008 Universal Routing Platforms)** show chassis environment cb  
<slot>

**Syntax (QFabric System)** show chassis environment cb  
<slot interconnect-device interconnect-device-name>  
< interconnect-device interconnect-device-name slot>

**Syntax (EX9251, EX9253 Switches)**

```
show chassis environment cb
<slot>
```

**Release Information**

Command introduced before Junos Release 7.4.  
 Command introduced in Junos OS Release 9.4 for EX Series switches.  
 Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.  
 Command introduced in Junos OS Release 12.1 for T4000 Core Routers.  
 option introduced for the TX Matrix Plus router in Junos Release 9.6.  
 Command introduced in Junos OS Release 11.3 for the QFX Series.  
 Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.  
 Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.  
 Command introduced in Junos OS Release 13.2 for MX104 Universal Routing Platforms.  
 Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.  
 Command introduced in Junos OS Release 17.2 for PTX10008 Routers.  
 Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.  
 Command introduced in Junos OS Release 17.4 for MX204 Universal Routing Platforms.  
 Command introduced in Junos OS Release 18.1R1 for EX9251 switches.  
 Command introduced in Junos OS Release 18.2 for EX9253 Switches.  
 Command introduced in Junos OS Release 18.2 for MX10008 Universal Routing Platforms..

**Description**

(M120, M320, MX Series, and T Series routers, EX8200 switches, and PTX Series Packet Transport Routers only) Display environmental information about the Control Boards (CBs).

**Options**

**none**—Display environmental information about all CBs. For a TX Matrix router, display environmental information about all CBs on the TX Matrix router and its attached T640 routers. For a TX Matrix Plus router, display environmental information about all CBs on the TX Matrix Plus router and its attached T1600 or T4000 routers.

**all-members**—(MX Series routers only) (Optional) Display environmental information about the CBs on all the members of the Virtual Chassis configuration.

**interconnect-device**—(QFabric systems only) Display environmental information about CBs on the Interconnect device.

**lcc number**—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.

- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers only) (Optional) Display environmental information about the CBs on the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Display environmental information about the CBs on the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

**scc**—(TX Matrix router only) (Optional) Display environmental information about the CBs in the TX Matrix router (switch-card chassis).

**sfc *number***—(TX Matrix Plus router only) (Optional) Display environmental information about the CBs in the TX Matrix Plus router (or switch-fabric chassis).

**slot**—(Optional) Display environmental information about the specified CB. On routers and PTX Series Packet Transport Routers, replace *slot* with **0** or **1**. On EX Series switches replace *slot* with **0**, **1**, or **2**. On QFX Series switches, replace *slot* with **0** or **1**.

Required Privilege  
Level

view

Related  
Documentation

- [request chassis cb on page 840](#)
- *Understanding Switching Control Board Redundancy*

List of Sample Output

[show chassis environment cb \(M120 Router\) on page 1070](#)  
[show chassis environment cb \(M320 Router\) on page 1070](#)  
[show chassis environment cb \(MX80 Router\) on page 1071](#)  
[show chassis environment cb \(MX104 Router\) on page 1071](#)  
[show chassis environment cb \(MX240 Router\) on page 1071](#)  
[show chassis environment cb \(MX240 Router with Enhanced MX SCB\) on page 1072](#)  
[show chassis environment cb \(MX480 Router\) on page 1072](#)  
[show chassis environment cb \(MX480 Router with Enhanced MX SCB\) on page 1073](#)  
[show chassis environment cb \(MX960 Router\) on page 1073](#)  
[show chassis environment cb \(MX960 Router with Enhanced MX SCB\) on page 1074](#)  
[show chassis environment cb \(MX2020 Router\) on page 1074](#)  
[show chassis environment cb \(MX2010 Router\) on page 1075](#)  
[show chassis environment cb \(MX2008 Router\) on page 1076](#)  
[show chassis environment cb \(MX10003 Router\) on page 1077](#)  
[show chassis environment cb \(MX204 Router\) on page 1078](#)  
[show chassis environment cb \(MX10008 Router\) on page 1079](#)  
[show chassis environment cb \(T4000 Core Router\) on page 1080](#)  
[show chassis environment cb \(TX Matrix Router\) on page 1080](#)  
[show chassis environment cb \(TX Matrix Plus Router\) on page 1081](#)

[show chassis environment cb \(EX8200 Switch\) on page 1085](#)  
[show chassis environment cb \(EX8208 Switch\) on page 1086](#)  
[show chassis environment cb \(EX9251 Switch\) on page 1087](#)  
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[show chassis environment cb \(PTX5000 Packet Transport Router\) on page 1089](#)  
[show chassis environment cb \(PTX10008 Router\) on page 1089](#)  
[show chassis environment cb \(PTX10016 Router\) on page 1090](#)  
[show chassis environment cb \(QFabric System\) on page 1091](#)

**Output Fields** Table 99 on page 1069 lists the output fields for the **show chassis environment cb** command. Output fields are listed in the approximate order in which they appear.

*Table 99: show chassis environment cb Output Fields*

Field Name	Field Description
<b>State</b>	<p>Status of the CB. If two CBs are installed and online, one is functioning as the master, and the other is the standby.</p> <ul style="list-style-type: none"> <li>• <b>Online</b>—CB is online and running.</li> <li>• <b>Offline</b>—CB is powered down.</li> </ul> <p><b>NOTE:</b> On the EX8208 switch, the installation can include three CBs.</p>
<b>Temperature</b>	<p>Temperature in Celsius (C) and Fahrenheit (F) of the air flowing past the CB.</p> <ul style="list-style-type: none"> <li>• <b>Temperature Intake</b>—Measures the temperature of the air intake to cool the power supplies.</li> <li>• <b>Temperature Exhaust</b>—Measures the temperature of the hot air exhaust.</li> </ul> <p><b>NOTE:</b> On the MX2010, MX2020, and MX2008 routers, the intake temperature measures the temperature of the air intake to cool the Control Board (CB). The MX2010, MX2020, and MX2008 routers include intake and exhaust temperatures for multiple zones (<b>Intake A</b>, <b>Intake B</b>, <b>Intake C</b>, <b>Exhaust A</b>, <b>Exhaust B</b>, and <b>TCBC</b>).</p>
<b>Power</b>	<p>Power required and measured on the CB. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.</p>
<b>BUS Revision</b>	<p>Revision level of the generic bus device. (Not on switches.)</p>
<b>FPGA Revision</b>	<p>Revision level of the field-programmable gate array (FPGA). (Not on switches.)</p>
<b>PMBus device</b> (on MX240, MX480, and MX960 routers with Enhanced MX SCB)	<p>Enhanced SCB on MX 240, MX480, and MX960 routers allows the system to save power by supplying only the amount of voltage that is required. Configurable PMBus devices are used to provide the voltage for each individual device. There is one PMBus device for each XF ASIC so that the output can be customized to each device. The following PMBus device information is displayed for routers with Enhanced MX SCB:</p> <ul style="list-style-type: none"> <li>• <b>Expected voltage</b></li> <li>• <b>Measured voltage</b></li> <li>• <b>Measured current</b></li> <li>• <b>Calculated power</b></li> </ul>

## Sample Output

### show chassis environment cb (M120 Router)

```
user@host> show chassis environment cb
```

```
CB 0 status:
State                Online Master
Temperature          33 degrees C / 91 degrees F
Power
  1.2 V              1214 mV
  1.5 V              1495 mV
  2.5 V              2494 mV
  3.3 V              3319 mV
  5.0 V              5085 mV
  3.3 V bias         3296 mV
Bus Revision         12
FPGA Revision        17
CB 1 status:
State                Online Standby
Temperature          34 degrees C / 93 degrees F
Power
  1.2 V              1195 mV
  1.5 V              1495 mV
  2.5 V              2504 mV
  3.3 V              3312 mV
  5.0 V              5111 mV
  3.3 V bias         3296 mV
Bus Revision         12
FPGA Revision        17
```

### show chassis environment cb (M320 Router)

```
user@host> show chassis environment cb
```

```
CB 0 status:
State                Online Master
Temperature          29 degrees C / 84 degrees F
Power:
  1.8 V              1805 mV
  2.5 V              2501 mV
  3.3 V              3293 mV
  4.6 V              4725 mV
  5.0 V              5032 mV
  12.0 V             11975 mV
  3.3 V bias         3286 mV
  8.0 V bias         7589 mV
BUS Revision         40
FPGA Revision        7
CB 1 status:
State                Online Standby
Temperature          32 degrees C / 89 degrees F
Power:
  1.8 V              1802 mV
  2.5 V              2482 mV
  3.3 V              3289 mV
  4.6 V              4720 mV
  5.0 V              5001 mV
  12.0 V             11946 mV
  3.3 V bias         3274 mV
```



8.0 V bias	7562 mV
BUS Revision	40
FPGA Revision	7

### show chassis environment cb (MX80 Router)

```
user@host> show chassis environment cb
```

```
CB 0 status:
State                Online Master
Temperature           36 degrees C / 96 degrees F
Power 1
  1.0 V               1034 mV
  1.0 V MQ            1037 mV
  1.0 V LU            1005 mV
  1.2 V               1218 mV
  1.5 V               1524 mV
  1.8 V               1814 mV
  2.5 V               2558 mV
  3.3 V               3296 mV
  5.0 V               5233 mV
  5.0 V bias          5207 mV
  12.0 V              12162 mV
```

### show chassis environment cb (MX104 Router)

```
user@host > show chassis environment cb
```

```
CB 0 status:
State                Online Master
Temperature           33 degrees C / 91 degrees F
Power 1
  0.75 V              751 mV
  1.0 V               1005 mV
  1.1 V               1113 mV
  1.5 V               1494 mV
  2.5 V               2518 mV
  3.3 V               3338 mV
  5.0 V               4960 mV
  12.0 V              12006 mV
FPGA Revision         25
CB 1 status:
State                Empty
```

### show chassis environment cb (MX240 Router)

```
user@host> show chassis environment cb
```

```
CB 0 status:
State                Online Standby
Temperature           37 degrees C / 98 degrees F
Power 1
  1.2 V               1208 mV
  1.5 V               1521 mV
  1.8 V               1811 mV
  2.5 V               2513 mV
  3.3 V               3332 mV
  5.0 V               5059 mV
  12.0 V              12162 mV
```

```

1.25 V          1260 mV
3.3 V SM3       3306 mV
5.0 V RE        5085 mV
12.0 V RE       11872 mV
Power 2
11.3 V bias PEM 11272 mV
4.6 V bias MidPlane 4827 mV
11.3 V bias FPD 11272 mV
11.3 V bias POE 0 11292 mV
11.3 V bias POE 1 11253 mV
Bus Revision    42
FPGA Revision   1

```

### show chassis environment cb (MX240 Router with Enhanced MX SCB)

```
user@host> show chassis environment cb
```

```

CB 0 status:
State                Online Standby
Temperature          37 degrees C / 98 degrees F
Power 1
1.2 V               1208 mV
1.5 V               1521 mV
1.8 V               1811 mV
2.5 V               2513 mV
3.3 V               3332 mV
5.0 V               5059 mV
12.0 V              12162 mV
1.25 V              1260 mV
3.3 V SM3           3306 mV
5.0 V RE            5085 mV
12.0 V RE           11872 mV
Power 2
11.3 V bias PEM     11272 mV
4.6 V bias MidPlane 4827 mV
11.3 V bias FPD     11272 mV
11.3 V bias POE 0   11292 mV
11.3 V bias POE 1   11253 mV
Bus Revision        42
FPGA Revision       1
PMBus               Expected Measured Measured Calculated
device              voltage  voltage  current  power
XF ASIC A           1000 mV   997 mV   11031 mA 10997 mW
XF ASIC B           1000 mV   996 mV   12125 mA 12076 mW

```

### show chassis environment cb (MX480 Router)

```
user@host> show chassis environment cb
```

```

CB 0 status:
State                Online Master
Temperature          41 degrees C / 105 degrees F
Power 1
1.2 V               1202 mV
1.5 V               1511 mV
1.8 V               1798 mV
2.5 V               2507 mV
3.3 V               3312 mV
5.0 V               5027 mV

```

```

12.0 V          12200 mV
1.25 V          1260 mV
3.3 V SM3       3293 mV
5 V RE          5040 mV
12 V RE         11910 mV
Power 2
11.3 V bias PEM 11156 mV
4.6 V bias MidPlane 4801 mV
11.3 V bias FPD 11214 mV
11.3 V bias POE 0 11098 mV
11.3 V bias POE 1 11330 mV
Bus Revision    42
FPGA Revision   1

```

### show chassis environment cb (MX480 Router with Enhanced MX SCB)

```
user@host> show chassis environment cb
```

```

CB 0 status:
State          Online Master
Temperature    41 degrees C / 105 degrees F
Power 1
1.2 V          1202 mV
1.5 V          1511 mV
1.8 V          1798 mV
2.5 V          2507 mV
3.3 V          3312 mV
5.0 V          5027 mV
12.0 V         12200 mV
1.25 V         1260 mV
3.3 V SM3      3293 mV
5 V RE         5040 mV
12 V RE        11910 mV
Power 2
11.3 V bias PEM 11156 mV
4.6 V bias MidPlane 4801 mV
11.3 V bias FPD 11214 mV
11.3 V bias POE 0 11098 mV
11.3 V bias POE 1 11330 mV
Bus Revision    42
FPGA Revision   1
PMBus           Expected Measured Measured Calculated
device          voltage  voltage  current  power
XF ASIC A       1000 mV   997 mV   11031 mA 10997 mW
XF ASIC B       1000 mV   996 mV   12125 mA 12076 mW

```

### show chassis environment cb (MX960 Router)

```
user@host> show chassis environment cb
```

```

CB 0 status:
State          Online Master
Temperature    24 degrees C / 75 degrees F
Power 1
1.2 V          1965 mV
1.5 V          2465 mV
1.8 V          2990 mV
2.5 V          3296 mV
3.3 V          3296 mV

```

```

5.0 V          6593 mV
12.0 V         13187 mV
3.3 V bias     3296 mV
1.25 V         1994 mV
3.3 V SM3      3296 mV
5 V RE         6593 mV
12 V RE        13174 mV
Power 2        Sensor failure
Bus Revision   4
FPGA Revision  3

```

### show chassis environment cb (MX960 Router with Enhanced MX SCB)

```
user@host> show chassis environment cb
```

```

CB 0 status:
State                Online Master
Temperature           24 degrees C / 75 degrees F
Power 1
  1.2 V              1965 mV
  1.5 V              2465 mV
  1.8 V              2990 mV
  2.5 V              3296 mV
  3.3 V              3296 mV
  5.0 V              6593 mV
  12.0 V             13187 mV
  3.3 V bias         3296 mV
  1.25 V             1994 mV
  3.3 V SM3          3296 mV
  5 V RE             6593 mV
  12 V RE            13174 mV
Power 2              Sensor failure
Bus Revision         4
FPGA Revision        3
PMBus
device              Expected voltage   Measured voltage   Measured current   Calculated power
XF ASIC A           1000 mV           997 mV            11031 mA           10997 mW
XF ASIC B           1000 mV           996 mV            12125 mA           12076 mW

```

### show chassis environment cb (MX2020 Router)

```
user@host> show chassis environment cb
```

```

CB 0 status:
State                Online Master
IntakeA-Zone0 Temperature 44 degrees C / 111 degrees F
IntakeB-Zone1 Temperature 34 degrees C / 93 degrees F
IntakeC-Zone0 Temperature 45 degrees C / 113 degrees F
ExhaustA-Zone0 Temperature 43 degrees C / 109 degrees F
ExhaustB-Zone1 Temperature 36 degrees C / 96 degrees F
TCBC-Zone0 Temperature 39 degrees C / 102 degrees F
Power 1
  1.0 V              1011 mV
  1.2 V              1208 mV
  1.8 V              1801 mV
  2.5 V              2552 mV
  3.3 V              3312 mV
  5.0 V              5040 mV
  5.0 V RE           4988 mV

```

```

    12.0 V          12065 mV
    12.0 V RE       12046 mV
    Bus Revision    99
    FPGA Revision   270
CB 1 status:
  State            Online Standby
  IntakeA-Zone0 Temperature 45 degrees C / 113 degrees F
  IntakeB-Zone1 Temperature 41 degrees C / 105 degrees F
  IntakeC-Zone0 Temperature 46 degrees C / 114 degrees F
  ExhaustA-Zone0 Temperature 44 degrees C / 111 degrees F
  ExhaustB-Zone1 Temperature 41 degrees C / 105 degrees F
  TCBC-Zone0 Temperature 45 degrees C / 113 degrees F
  Power 1
    1.0 V          1008 mV
    1.2 V          1208 mV
    1.8 V          1798 mV
    2.5 V          2539 mV
    3.3 V          3325 mV
    5.0 V          5033 mV
    5.0 V RE       4950 mV
    12.0 V         12046 mV
    12.0 V RE      11968 mV
    Bus Revision   99
    FPGA Revision  0

```

### show chassis environment cb (MX2010 Router)

```
user@host> show chassis environment cb
```

```

CB 0 status:
  State            Online Master
  IntakeA-Zone0 Temperature 36 degrees C / 96 degrees F
  IntakeB-Zone1 Temperature 30 degrees C / 86 degrees F
  IntakeC-Zone0 Temperature 38 degrees C / 100 degrees F
  ExhaustA-Zone0 Temperature 36 degrees C / 96 degrees F
  ExhaustB-Zone1 Temperature 32 degrees C / 89 degrees F
  TCBC-Zone0 Temperature 34 degrees C / 93 degrees F
  Power 1
    1.0 V          1015 mV
    1.2 V          1205 mV
    1.8 V          1804 mV
    2.5 V          2552 mV
    3.3 V          3325 mV
    5.0 V          5020 mV
    5.0 V RE       4988 mV
    12.0 V         12104 mV
    12.0 V RE      12026 mV
    Bus Revision   100
    FPGA Revision  270
CB 1 status:
  State            Online
  IntakeA-Zone0 Temperature 35 degrees C / 95 degrees F
  IntakeB-Zone1 Temperature 28 degrees C / 82 degrees F
  IntakeC-Zone0 Temperature 37 degrees C / 98 degrees F
  ExhaustA-Zone0 Temperature 34 degrees C / 93 degrees F
  ExhaustB-Zone1 Temperature 29 degrees C / 84 degrees F
  TCBC-Zone0 Temperature 32 degrees C / 89 degrees F
  Power 1
    1.0 V          1011 mV
    1.2 V          1208 mV

```

1.8 V	1788 mV
2.5 V	2526 mV
3.3 V	3319 mV
5.0 V	5046 mV
5.0 V RE	4975 mV
12.0 V	12046 mV
12.0 V RE	12007 mV
Bus Revision	100
FPGA Revision	0

### show chassis environment cb (MX2008 Router)

```
user@host> show chassis environment cb
```

CB 0 status:

State	Online Master
Inlet1 Temperature	37 degrees C / 98 degrees F
Inlet2 Temperature	45 degrees C / 113 degrees F
Inlet3 Temperature	44 degrees C / 111 degrees F
Inlet4 Temperature	42 degrees C / 107 degrees F
Exhaust1 Temperature	30 degrees C / 86 degrees F
Exhaust2 Temperature	40 degrees C / 104 degrees F
Exhaust3 Temperature	48 degrees C / 118 degrees F
Exhaust4 Temperature	46 degrees C / 114 degrees F
Power 1	
1.0 V PHY	989 mV
1.15 V	1150 mV
1.2 V bias	1189 mV
1.5 V	1488 mV
1.8 V	1772 mV
2.5 V	2462 mV
3.3 V bias	3296 mV
VCCIO	1028 mV
Power 2	
1.1 V	1099 mV
3.3 V	3300 mV
Power 3	
0.95 V XL710	949 mV
1.05 V	1050 mV
Power 4	
1.2 V	1199 mV
5.0 V	4999 mV
Power 5	
1.0 V	1000 mV
1.2 V PHY	1199 mV
Bus Revision	114
FPGA Revision	1

CB 1 status:

State	Online Standby
Inlet1 Temperature	30 degrees C / 86 degrees F
Inlet2 Temperature	31 degrees C / 87 degrees F
Inlet3 Temperature	29 degrees C / 84 degrees F
Inlet4 Temperature	32 degrees C / 89 degrees F
Exhaust1 Temperature	30 degrees C / 86 degrees F
Exhaust2 Temperature	33 degrees C / 91 degrees F
Exhaust3 Temperature	34 degrees C / 93 degrees F
Exhaust4 Temperature	35 degrees C / 95 degrees F
Power 1	
1.0 V PHY	986 mV
1.15 V	1153 mV

```

1.2 V bias          1195 mV
1.5 V              1498 mV
1.8 V              1798 mV
2.5 V              2494 mV
3.3 V bias          3296 mV
VCCIO              1034 mV
Power 2
  1.1 V            1100 mV
  3.3 V            3300 mV
Power 3
  0.95 V XL710     949 mV
  1.05 V           1050 mV
Power 4
  1.2 V            1199 mV
  5.0 V            5000 mV
Power 5
  1.0 V            1000 mV
  1.2 V PHY        1199 mV
Bus Revision        114
FPGA Revision       1

```

#### show chassis environment cb (MX10003 Router)

```
user@host> show chassis environment cb
```

```

CB 0 status:
State                               Online Master
CB 0 Exhaust Temp Sensor 0x49 35 degrees C / 95 degrees F
CB 0 Inlet Temp Sensor 0x49 28 degrees C / 82 degrees F
Power
  VDD1V5_PCH          1489 mV
  VDDIO                940 mV
  VDD3V3_PCH          3332 mV
  VDD2V5_AB            2508 mV
  VDD1V8_CLC          1764 mV
  VDD3V3              3292 mV
  VDD2V5_CD            2508 mV
  VDD1V2_CBC_GTX       0 mV
  VDD1V8_GLS_GTX       0 mV
  VDD1V2_CBC           0 mV
  VDD1V8_GLS           0 mV
  BIAS3V3_BP           0 mV
  VDD1V2_GH            1200 mV
  VDD3V3_CBC           3299 mV
  VDD1V2_CD            1199 mV
  BIAS3V3              3340 mV
  VDD1V2_AB            1200 mV
  VDD5V0               5000 mV
  VDD1V05              1049 mV
  VDD1V05              1050 mV
  VCORE                1780 mV
      12V                12272 mV      3952 mA      48984 mW
CB 1 status:
State                               Online Standby
CB 1 Exhaust Temp Sensor 0x49 35 degrees C / 95 degrees F
CB 1 Inlet Temp Sensor 0x49 31 degrees C / 87 degrees F
Power
  VDD1V5_PCH          1489 mV
  VDDIO                940 mV

```

VDD3V3_PCH	3351 mV		
VDD2V5_AB	2508 mV		
VDD1V8_CLC	1764 mV		
VDD3V3	3312 mV		
VDD2V5_CD	2508 mV		
VDD1V2_CBC_GTX	1195 mV		
VDD1V8_GLS_GTX	1764 mV		
VDD1V2_CBC	1195 mV		
VDD1V8_GLS	1783 mV		
BIAS3V3_BP	4096 mV		
VDD1V2_GH	1200 mV		
VDD3V3_CBC	3300 mV		
VDD1V2_CD	1200 mV		
BIAS3V3	3339 mV		
VDD1V2_AB	1200 mV		
VDD5V0	5000 mV		
VDD1V05	1050 mV		
VDD1V05	1050 mV		
VCORE	1780 mV		
12V	12351 mV	3823 mA	45007 mW

### show chassis environment cb (MX204 Router)

```
user@host> show chassis environment cb
```

```
CB 0 status:
State                               Online Master
CB 0 Top Right Inlet Sensor35 degrees C / 95 degrees F
CB 0 Top Left Inlet Sensor 37 degrees C / 98 degrees F
CB 0 Top Right Exhaust Sensor43 degrees C / 109 degrees F
CB 0 Top Left Exhaust Sensor50 degrees C / 122 degrees F
CB 0 CPU Core-0 Temp               48 degrees C / 118 degrees F
CB 0 CPU Core-1 Temp               48 degrees C / 118 degrees F
CB 0 CPU Core-2 Temp               48 degrees C / 118 degrees F
CB 0 CPU Core-3 Temp               47 degrees C / 116 degrees F
CB 0 CPU Core-4 Temp               47 degrees C / 116 degrees F
CB 0 CPU Core-5 Temp               47 degrees C / 116 degrees F
CB 0 CPU Core-6 Temp               47 degrees C / 116 degrees F
CB 0 CPU Core-7 Temp               47 degrees C / 116 degrees F
Power
VDD1V5_PCH                         1509 mV
VDDIO                              950 mV
VDD3V3_PCH                         3312 mV
VDD2V5_AB                          2508 mV
VDD1V8_FRMR                        1813 mV
VDD3V3                             3312 mV
VDD2V5_CD                          2508 mV
VDD1V8_PLL                         1813 mV
VDD1V5                             1499 mV
EA0_1V5                           1499 mV
EA0_1V04                           1038 mV
EA0_PLL_1V0                        999 mV
EA0_2V5                            2508 mV
BIAS3V                             3332 mV
VDD1V2_CD                          1214 mV
VDD1V2_AB                          1215 mV
VDD1V05                            1050 mV
BIAS3V3                            3309 mV
VDD1V0                             1015 mV
```



VDD1V8	1804 mV		
VDD1V2	1199 mV		
VDD2V5	2504 mV		
EA0_VDD0V9	949 mV		
EA0_HM1_VDD0V9	899 mV		
EA0_VDD0V9R2	952 mV		
EA0_VDD1V0	1000 mV		
VDD3V3	3304 mV		
EA0_XR_VDD1V2	1199 mV		
EA0_XR_VDD0V9	903 mV		
EA0_HM_VDDM1V2	1199 mV		
EA0_HM_VDD1V2	1199 mV		
VDDCPU0	1770 mV		
12V Hotswap A	11968 mV	4696 mA	55466 mW
12V Hotswap B	12048 mV	14936 mA	180652 mW

### show chassis environment cb (MX10008 Router)

```
user@host> show chassis environment cb
```

```
CB 0 status:
State                               Online Master
CB 0 Intake A Temp Sensor           24 degrees C / 75 degrees F
CB 0 Intake B Temp Sensor           24 degrees C / 75 degrees F
CB 0 Exhaust A Temp Sensor          28 degrees C / 82 degrees F
CB 0 Exhaust B Temp Sensor          30 degrees C / 86 degrees F
CB 0 Middle Temp Sensor             28 degrees C / 82 degrees F
Power
  GESW_VDD1V0                       1000 mV
  VDD1V0                            1000 mV
  VDD1V2                            1199 mV
  VDD3V3                            3299 mV
  XL710_VCCD                        950 mV
  VDD1V05                           1050 mV
  VDD2V5                            2500 mV
  FPGA_VDD1V2                       1200 mV
  VDD1V8                            1800 mV
  VDD1V15                           1150 mV
  VDD1V1                             1099 mV
  VCCIO                             950 mV
  PHY_VDD1V0                        1000 mV
  VDD5V0                             4998 mV
  FPGA_VDD1V5                       1496 mV
  VDD1V5                             1496 mV
  12V                               12281 mV    7700 mA    92400 mW

CB 1 status:
State                               Online Standby
CB 1 Intake A Temp Sensor           24 degrees C / 75 degrees F
CB 1 Intake B Temp Sensor           23 degrees C / 73 degrees F
CB 1 Exhaust A Temp Sensor          27 degrees C / 80 degrees F
CB 1 Exhaust B Temp Sensor          30 degrees C / 86 degrees F
CB 1 Middle Temp Sensor             28 degrees C / 82 degrees F
Power
  GESW_VDD1V0                       999 mV
  VDD1V0                            1000 mV
  VDD1V2                            1199 mV
  VDD3V3                            3299 mV
  XL710_VCCD                        950 mV
  VDD1V05                           1050 mV
  VDD2V5                            2499 mV
```

FPGA_VDD1V2	1200 mV		
VDD1V8	1799 mV		
VDD1V15	1150 mV		
VDD1V1	1100 mV		
VCCIO	949 mV		
PHY_VDD1V0	999 mV		
VDD5V0	5000 mV		
FPGA_VDD1V5	1502 mV		
VDD1V5	1496 mV		
12V	12281 mV	8002 mA	96024 mW

### show chassis environment cb (T4000 Core Router)

```
user@host> show chassis environment cb
```

```
CB 0 status:
State                Online Master
Temperature           33 degrees C / 91 degrees F
Power 1
  1.8 V               1805 mV
  2.5 V               2523 mV
  3.3 V               3324 mV
  3.3 V bias          3296 mV
  4.6 V               4680 mV
  5.0 V               4893 mV
  8.0 V bias          7572 mV
  12.0 V              11916 mV
Power 2
  1.0 V               993 mV
  1.2 V               1210 mV
  3.3 V RE             3330 mV
Bus Revision          51
FPGA Revision          5
CB 1 status:
State                Online Standby
Temperature           33 degrees C / 91 degrees F
Power 1
  1.8 V               1810 mV
  2.5 V               2496 mV
  3.3 V               3308 mV
  3.3 V bias          3286 mV
  4.6 V               4692 mV
  5.0 V               4954 mV
  8.0 V bias          7282 mV
  12.0 V              11926 mV
Power 2
  1.0 V               993 mV
  1.2 V               1185 mV
  3.3 V RE             3316 mV
Bus Revision          51
FPGA Revision          5
```

### show chassis environment cb (TX Matrix Router)

```
user@host> show chassis environment cb
```

```
-----
CB 0 status:
State                Online Master
```

```

Temperature                32 degrees C / 89 degrees F
Power:
  1.8 V                    1797 mV
  2.5 V                    2477 mV
  3.3 V                    3311 mV
  4.6 V                    4727 mV
  5.0 V                    5015 mV
  12.0 V                   12185 mV
  3.3 V bias               3304 mV
  8.0 V bias               7870 mV
BUS Revision                40
FPGA Revision              1
CB 1 status:
  State                    Online Standby
...

```

```
lcc0-re0:
```

```

-----
CB 0 status:
  State                    Online Master
  Temperature              32 degrees C / 89 degrees F
  Power:
    1.8 V                  1787 mV
    2.5 V                  2473 mV
    3.3 V                  3306 mV
    4.6 V                  4793 mV
    5.0 V                  5025 mV
    12.0 V                 12156 mV
    3.3 V bias             3289 mV
    8.0 V bias             7609 mV
  BUS Revision             40
  FPGA Revision            5
CB 1 status:
  State                    Online Standby
....
  BUS Revision             40
  FPGA Revision            5

```

```
lcc2-re0:
```

```

-----
CB 0 status:
  State                    Online Master
...
CB 1 status:
  State                    Online Standby
...

```

### show chassis environment cb (TX Matrix Plus Router)

```
user@host> show chassis environment cb
```

```
sfc0-re0:
```

```

-----
CB 0 status:
  State                    Online Master
  Temperature              38 degrees C / 100 degrees F
  Power 1
    1.0 V                  1005 mV
    1.1 V                  1108 mV
    1.2 V                  1205 mV

```

```

1.25 V          1269 mV
1.5 V           1508 mV
1.8 V           1814 mV
2.5 V           2507 mV
3.3 V           3306 mV
3.3 V bias      3300 mV
9.0 V           9058 mV
9.0 V RE        9107 mV
Power 2
3.9 V           3963 mV
5.0 V           5020 mV
9.0 V           9087 mV
Bus Revision    79
FPGA Revision   23
CB 1 status:
State           Online Standby
Temperature      39 degrees C / 102 degrees F
Power 1
1.0 V           1002 mV
1.1 V           1105 mV
1.2 V           1198 mV
1.25 V          1276 mV
1.5 V           1504 mV
1.8 V           1804 mV
2.5 V           2507 mV
3.3 V           3300 mV
3.3 V bias      3293 mV
9.0 V           9039 mV
9.0 V RE        9049 mV
Power 2
3.9 V           3892 mV
5.0 V           5040 mV
9.0 V           9058 mV
Bus Revision    79
FPGA Revision   23
lcc0-re0:
-----
CB 0 status:
State           Online Master
Temperature      39 degrees C / 102 degrees F
Power 1
1.8 V           1799 mV
2.5 V           2499 mV
3.3 V           3327 mV
3.3 V bias      3299 mV
4.6 V           4673 mV
5.0 V           4918 mV
8.0 V bias      7308 mV
12.0 V          11887 mV
Power 2
1.0 V           996 mV
1.2 V           1199 mV
3.3 V RE        3319 mV
Bus Revision    51
FPGA Revision   3
CB 1 status:
State           Online Standby
Temperature      40 degrees C / 104 degrees F
Power 1

```

```

1.8 V          1800 mV
2.5 V          2496 mV
3.3 V          3322 mV
3.3 V bias     3284 mV
4.6 V          4680 mV
5.0 V          4954 mV
8.0 V bias     7284 mV
12.0 V         11902 mV
Power 2
1.0 V          998 mV
1.2 V          1205 mV
3.3 V RE       3327 mV
Bus Revision    51
FPGA Revision   3

```

```
lcc1-re0:
```

```
-----
CB 0 status:
```

```

State          Online Master
Temperature     41 degrees C / 105 degrees F
Power 1
1.8 V          1804 mV
2.5 V          2517 mV
3.3 V          3300 mV
3.3 V bias     3284 mV
4.6 V          4681 mV
5.0 V          4927 mV
8.0 V bias     7357 mV
12.0 V         11907 mV
Power 2
1.0 V          991 mV
1.2 V          1202 mV
3.3 V RE       3301 mV
Bus Revision    51
FPGA Revision   3

```

```
CB 1 status:
```

```

State          Online Standby
Temperature     40 degrees C / 104 degrees F
Power 1
1.8 V          1805 mV
2.5 V          2528 mV
3.3 V          3324 mV
3.3 V bias     3289 mV
4.6 V          4694 mV
5.0 V          4959 mV
8.0 V bias     7311 mV
12.0 V         11926 mV
Power 2
1.0 V          998 mV
1.2 V          1200 mV
3.3 V RE       3313 mV
Bus Revision    51
FPGA Revision   3

```

```
lcc2-re0:
```

```
-----
CB 0 status:
```

```

State          Online Master
Temperature     41 degrees C / 105 degrees F
Power 1

```

```

1.8 V          1805 mV
2.5 V          2494 mV
3.3 V          3333 mV
3.3 V bias     3296 mV
4.6 V          4673 mV
5.0 V          4901 mV
8.0 V bias     7343 mV
12.0 V         11916 mV
Power 2
1.0 V          993 mV
1.2 V          1213 mV
3.3 V RE       3328 mV
Bus Revision   51
FPGA Revision  3
CB 1 status:
State          Online Standby
Temperature     41 degrees C / 105 degrees F
Power 1
1.8 V          1804 mV
2.5 V          2523 mV
3.3 V          3334 mV
3.3 V bias     3291 mV
4.6 V          4697 mV
5.0 V          4969 mV
8.0 V bias     7308 mV
12.0 V         11936 mV
Power 2
1.0 V          996 mV
1.2 V          1200 mV
3.3 V RE       3328 mV
Bus Revision   51
FPGA Revision  3
lcc3-re0:
-----
CB 0 status:
State          Online Master
Temperature     37 degrees C / 98 degrees F
Power 1
1.8 V          1809 mV
2.5 V          2510 mV
3.3 V          3296 mV
3.3 V bias     3291 mV
4.6 V          4670 mV
5.0 V          4905 mV
8.0 V bias     7211 mV
12.0 V         11882 mV
Power 2
1.0 V          996 mV
1.2 V          1188 mV
3.3 V RE       3326 mV
Bus Revision   51
FPGA Revision  5
CB 1 status:
State          Online Standby
Temperature     38 degrees C / 100 degrees F
Power 1
1.8 V          1813 mV
2.5 V          2510 mV
3.3 V          3322 mV

```

3.3 V bias	3289 mV
4.6 V	4692 mV
5.0 V	4967 mV
8.0 V bias	7194 mV
12.0 V	11916 mV
Power 2	
1.0 V	996 mV
1.2 V	1205 mV
3.3 V RE	3273 mV
Bus Revision	51
FPGA Revision	5

### show chassis environment cb (EX8200 Switch)

```
user@host> show chassis environment cb
```

```
CB 0 status:
State                Online Master
Temperature Intake    20 degrees C / 68 degrees F
Temperature Exhaust    24 degrees C / 75 degrees F
Power 1
  1.1 V                1086 mV
  1.2 V                1179 mV
  1.2 V *              1182 mV
  1.2 V *              1182 mV
  1.25 V               1211 mV
  1.5 V                1472 mV
  1.8 V                1756 mV
  2.5 V                2449 mV
  3.3 V                3254 mV
  3.3 V bias           3300 mV
  5.0 V                4911 mV
  12.0 V               11891 mV
Power 2
  3.3 V bias *         3615 mV
  3.3 V bias *         3615 mV
  3.3 V bias *         3567 mV
  3.3 V bias *         3664 mV
  4.3 V bias *         4224 mV
  4.3 V bias *         4215 mV
  4.3 V bias *         4224 mV
  4.3 V bias *         4205 mV
  4.3 V bias *         4195 mV
  4.3 V bias *         4215 mV
  5.0 V bias           4920 mV
CB 1 status:
State                Online Standby
Temperature Intake    19 degrees C / 66 degrees F
Temperature Exhaust    23 degrees C / 73 degrees F
Power 1
  1.1 V                1082 mV
  1.2 V                1169 mV
  1.2 V *              1179 mV
  1.2 V *              1179 mV
  1.25 V               1214 mV
  1.5 V                1482 mV
  1.8 V                1759 mV
  2.5 V                2481 mV
  3.3 V                3248 mV
```

```

3.3 V bias          3306 mV
5.0 V              4911 mV
12.0 V            11910 mV
Power 2
3.3 V bias *       3644 mV
3.3 V bias *       3664 mV
3.3 V bias *       3586 mV
3.3 V bias *       3654 mV
4.3 V bias *       4224 mV
4.3 V bias *       4215 mV
4.3 V bias *       4224 mV
4.3 V bias *       4205 mV
4.3 V bias *       4244 mV
4.3 V bias *       4215 mV
5.0 V bias         4930 mV
CB 2 status:
State              Online
Temperature Intake  19 degrees C / 66 degrees F
Temperature Exhaust 23 degrees C / 73 degrees F
Power 1
1.2 V              1195 mV
1.5 V              1511 mV
1.8 V              1804 mV
2.5 V              2526 mV
3.3 V              3300 mV
3.3 V bias         3306 mV
12.0 V            12220 mV

```

### show chassis environment cb (EX8208 Switch)

```
user@host> show chassis environment cb
```

```

CB 0 status:
State              Online Master
Temperature Intake  20 degrees C / 68 degrees F
Temperature Exhaust 24 degrees C / 75 degrees F
Power 1
1.1 V              1086 mV
1.2 V              1179 mV
1.2 V *            1182 mV
1.2 V *            1182 mV
1.25 V             1211 mV
1.5 V              1466 mV
1.8 V              1759 mV
2.5 V              2455 mV
3.3 V              3261 mV
3.3 V bias         3300 mV
5.0 V              4930 mV
12.0 V            11891 mV
Power 2
3.3 V bias *       3606 mV
3.3 V bias *       3615 mV
3.3 V bias *       3567 mV
3.3 V bias *       3673 mV
4.3 V bias *       4224 mV
4.3 V bias *       4215 mV
4.3 V bias *       4234 mV
4.3 V bias *       4205 mV
4.3 V bias *       4186 mV
4.3 V bias *       4215 mV

```



```

    5.0 V bias                4940 mV
CB 1 status:
  State                      Online Standby
  Temperature Intake         19 degrees C / 66 degrees F
  Temperature Exhaust        23 degrees C / 73 degrees F
  Power 1
    1.1 V                    1086 mV
    1.2 V                    1169 mV
    1.2 V *                  1179 mV
    1.2 V *                  1179 mV
    1.25 V                   1211 mV
    1.5 V                    1479 mV
    1.8 V                    1759 mV
    2.5 V                    2475 mV
    3.3 V                    3235 mV
    3.3 V bias               3306 mV
    5.0 V                    4930 mV
    12.0 V                   11891 mV
  Power 2
    3.3 V bias *             3644 mV
    3.3 V bias *             3664 mV
    3.3 V bias *             3586 mV
    3.3 V bias *             3654 mV
    4.3 V bias *             4215 mV
    4.3 V bias *             4224 mV
    4.3 V bias *             4215 mV
    4.3 V bias *             4215 mV
    4.3 V bias *             4234 mV
    4.3 V bias *             4224 mV
    5.0 V bias               4920 mV
CB 2 status:
  State                      Online
  Temperature Intake         20 degrees C / 68 degrees F
  Temperature Exhaust        24 degrees C / 75 degrees F
  Power 1
    1.2 V                    1202 mV
    1.5 V                    1508 mV
    1.8 V                    1804 mV
    2.5 V                    2520 mV
    3.3 V                    3300 mV
    3.3 V bias               3300 mV
    12.0 V                   12200 mV

```

### show chassis environment cb (EX9251 Switch)

```
user@switch> show chassis environment cb
```

```

CB 0 status:
  State                      Online Master
  CB 0 Top Right Inlet Sensor 29 degrees C / 84 degrees F
  CB 0 Top Left Inlet Sensor 28 degrees C / 82 degrees F
  CB 0 Top Right Exhaust Sensor 40 degrees C / 104 degrees F
  CB 0 Top Left Exhaust Sensor 59 degrees C / 138 degrees F
  CB 0 CPU Core-0 Temp       45 degrees C / 113 degrees F
  CB 0 CPU Core-1 Temp       44 degrees C / 111 degrees F
  CB 0 CPU Core-2 Temp       44 degrees C / 111 degrees F
  CB 0 CPU Core-3 Temp       44 degrees C / 111 degrees F
  CB 0 CPU Core-4 Temp       45 degrees C / 113 degrees F
  CB 0 CPU Core-5 Temp       44 degrees C / 111 degrees F
  CB 0 CPU Core-6 Temp       44 degrees C / 111 degrees F

```

```

CB 0 CPU Core-7 Temp      43 degrees C / 109 degrees F
Power
VDD1V5_PCH                1499 mV
VDDIO                      950 mV
VDD3V3_PCH                3312 mV
VDD2V5_AB                 2489 mV
VDD1V8_FRMR              1793 mV
VDD3V3                   3292 mV
VDD2V5_CD                 2508 mV
VDD1V8_PLL               1793 mV
VDD1V5                   1499 mV
EA0_1V5                  1499 mV
EA0_1V04                  999 mV
EA0_PLL_1V0              999 mV
EA0_2V5                  2508 mV
BIAS3V                   3292 mV
VDD1V2_CD                1215 mV
VDD1V2_AB                1214 mV
VDD1V05                  1050 mV
BIAS3V3                  3309 mV
VDD1V0                   1014 mV
VDD1V8                   1805 mV
VDD1V2                   1200 mV
VDD2V5                   2504 mV
EA0_VDD0V9               949 mV
EA0_HM1_VDD0V9           899 mV
EA0_VDD0V9R2             952 mV
EA0_VDD1V0               999 mV
VDD3V3                   3305 mV
EA0_XR_VDD1V2            1199 mV
EA0_XR_VDD0V9            903 mV
EA0_HM_VDDM1V2           1199 mV
EA0_HM_VDD1V2            1199 mV
VDDCPU0                  1770 mV
12V Hotswap A             11955 mV   4861 mA   59347 mW
12V Hotswap B             11916 mV   15046 mA  180887 mW

```

### show chassis environment cb (EX9253 Switch)

```
user@switch> show chassis environment cb
```

```

CB 0 status:
State                      Online Master
CB 0 Exhaust Temp Sensor   38 degrees C / 100 degrees F
CB 0 Inlet Temp Sensor     32 degrees C / 89 degrees F
CB 0 CPU DIE Temp Sensor   43 degrees C / 109 degrees F
Power
VDD1V5_PCH                1489 mV
VDDIO                      940 mV
VDD3V3_PCH                3332 mV
VDD2V5_AB                 2508 mV
VDD1V8_CLC               1783 mV
VDD3V3                   3312 mV
VDD2V5_CD                 2508 mV
VDD1V2_CBC_GTX           1195 mV
VDD1V8_GLS_GTX           1783 mV
VDD1V2_CBC               1176 mV
VDD1V8_GLS               1783 mV
BIAS3V3_BP               3978 mV
VDD1V2_GH                1200 mV

```

```

VDD3V3_CBC          3299 mV
VDD1V2_CD           1200 mV
BIAS3V3             3340 mV
VDD1V2_AB           1199 mV
VDD5V0              5000 mV
VDD1V05             1050 mV
VDD1V05             1050 mV
VCORE                1770 mV
12V                  12061 mV    4806 mA    57841 mW
CB 1 status:
State                Offline
CB 1 Exhaust Temp Sensor 32 degrees C / 89 degrees F
CB 1 Inlet Temp Sensor  29 degrees C / 84 degrees F
CB 1 CPU DIE Temp Sensor 43 degrees C / 109 degrees F
Power                Disabled

```

### show chassis environment cb (PTX5000 Packet Transport Router)

```
user@host> show chassis environment cb
```

```

CB 0 status:
State                Online Master
Intake Temperature    38 degrees C / 100 degrees F
Exhaust A Temperature 45 degrees C / 113 degrees F
Exhaust B Temperature 42 degrees C / 107 degrees F
Power 1
  1.2 V              1200 mV
  1.25 V             1250 mV
  2.5 V              2500 mV
  3.3 V              3300 mV
Power 2
  1.0 V              1000 mV
  3.3 V bias         3293 mV
  3.9 V              3921 mV
Bus Revision          132
FPGA Revision         27
CB 1 status:
State                Online Standby
Intake Temperature    34 degrees C / 93 degrees F
Exhaust A Temperature 39 degrees C / 102 degrees F
Exhaust B Temperature 36 degrees C / 96 degrees F
Power 1
  1.2 V              1199 mV
  1.25 V             1250 mV
  2.5 V              2499 mV
  3.3 V              3299 mV
Power 2
  1.0 V              1000 mV
  3.3 V bias         3312 mV
  3.9 V              3961 mV
Bus Revision          132
FPGA Revision         28

```

### show chassis environment cb (PTX10008 Router)

```
user@host> show chassis environment cb
```

```

CB 0 status:
State                Online Master

```

```

CB 0 Intake Temp Sensor    28 degrees C / 82 degrees F
CB 0 Exhaust Temp Sensor  32 degrees C / 89 degrees F
Power
  VDD 2.5V                2489 mV
  Bias 3.3V               3332 mV
  VDD 3.3V                3292 mV
  VCC 1.8V                1822 mV
  VDD 1.2V                1205 mV
  VCC 1V                  999 mV
  VCC CPU 1.8V            1803 mV
  VDD 2.5V                2489 mV
  VCC Aux 5V              5115 mV
  VDD DDR 1.5V            1499 mV
  VTT SA CPU 0.8V         803 mV
  VTT CPU 1.05V           1048 mV
  VCC Core CPU            901 mV
  VCC PCH 1.5V            1519 mV
  VDD 1.05V               1048 mV
  VCC 2.5V                2508 mV
  FORT VCCA 1V            960 mV
  VDD .85V                862 mV
  VTT DDRA .75V           744 mV
  VTT DDRB .75V           744 mV
  12V                     12285 mV    3779 mA    46339 mW
CB 1 status:
State                      Online Standby
CB 1 Intake Temp Sensor    27 degrees C / 80 degrees F
CB 1 Exhaust Temp Sensor  32 degrees C / 89 degrees F
Power
  VDD 2.5V                2489 mV
  Bias 3.3V               3332 mV
  VDD 3.3V                3273 mV
  VCC 1.8V                1822 mV
  VDD 1.2V                1195 mV
  VCC 1V                  999 mV
  VCC CPU 1.8V            1783 mV
  VDD 2.5V                2489 mV
  VCC Aux 5V              5056 mV
  VDD DDR 1.5V            1499 mV
  VTT SA CPU 0.8V         793 mV
  VTT CPU 1.05V           1048 mV
  VCC Core CPU            882 mV
  VCC PCH 1.5V            1509 mV
  VDD 1.05V               1048 mV
  VCC 2.5V                2489 mV
  FORT VCCA 1V            960 mV
  VDD .85V                862 mV
  VTT DDRA .75V           744 mV
  VTT DDRB .75V           744 mV
  12V                     12391 mV    3779 mA    46727 mW

```

#### show chassis environment cb (PTX10016 Router)

```
user@host> show chassis environment cb
```

```

CB 0 status:
State                      Online Master
CB 0 Intake Temp Sensor    20 degrees C / 68 degrees F
CB 0 Exhaust Temp Sensor  24 degrees C / 75 degrees F
Power

```

```

VDD 2.5V                2508 mV
Bias 3.3V               3351 mV
VDD 3.3V                3292 mV
VCC 1.8V                1832 mV
VDD 1.2V                1205 mV
VCC 1V                  999 mV
VCC CPU 1.8V            1793 mV
VDD 2.5V                2508 mV
VCC Aux 5V              5056 mV
VDD DDR 1.5V            1509 mV
VTT SA CPU 0.8V         803 mV
VTT CPU 1.05V           1048 mV
VCC Core CPU            960 mV
VCC PCH 1.5V            1519 mV
VDD 1.05V               1058 mV
VCC 2.5V                2528 mV
FORT VCCA 1V            960 mV
VDD .85V                852 mV
VTT DDRA .75V           744 mV
VTT DDRB .75V           744 mV
12V                     12259 mV    3649 mA    45173 mW
CB 1 status:
State                   Online Standby
CB 1 Intake Temp Sensor 20 degrees C / 68 degrees F
CB 1 Exhaust Temp Sensor 23 degrees C / 73 degrees F
Power
VDD 2.5V                2508 mV
Bias 3.3V               3312 mV
VDD 3.3V                3273 mV
VCC 1.8V                1822 mV
VDD 1.2V                1195 mV
VCC 1V                  989 mV
VCC CPU 1.8V            1783 mV
VDD 2.5V                2489 mV
VCC Aux 5V              5086 mV
VDD DDR 1.5V            1499 mV
VTT SA CPU 0.8V         803 mV
VTT CPU 1.05V           1048 mV
VCC Core CPU            1029 mV
VCC PCH 1.5V            1519 mV
VDD 1.05V               1048 mV
VCC 2.5V                2528 mV
FORT VCCA 1V            960 mV
VDD .85V                862 mV
VTT DDRA .75V           744 mV
VTT DDRB .75V           744 mV
12V                     12285 mV    3952 mA    48447 mW

```

### show chassis environment cb (QFabric System)

```
user@switch> show chassis environment cb interconnect-device IC-123 0
```

```

CB 0 status:
State                   Online Master
Left Intake Temperature 33 degrees C / 91 degrees F
Right Intake Temperature 33 degrees C / 91 degrees F
Left Exhaust Temperature 36 degrees C / 96 degrees F
Right Exhaust Temperature 35 degrees C / 95 degrees F
Power                   OK
VDD 3V3                3294 mV

```

VDD 2V5	2436 mV
VDD 1V8	1746 mV
VDD 1V5	1460 mV
VDD 1V25	1210 mV
VDD 1V2	1164 mV
CPU CORE 1V2	1120 mV
VDD 1V0	968 mV
VDD 5V0	5088 mV
CPU MP BIAS 4V3	4050 mV
BIAS 3V3	3180 mV
VTT 0V9	866 mV

## show chassis environment ccg

**Syntax** `show chassis environment ccg  
<slot>`

**Release Information** Command introduced in Junos OS Release 12.1.

**Description** (PTX5000 Packet Transport Routers only) Display environmental information about the Centralized Clock Generators (CCGs).

**Options** **none**—Display environmental information about all CCGs on the router.

**slot** —(Optional) Display environmental information about the specified CCG. Replace *slot* with 0 or 1.

**Required Privilege Level** view

**Related Documentation**

- [Clock Sources for PTX Series Packet Transport Routers on page 306](#)
- [show chassis environment on page 969](#)

**List of Sample Output** [show chassis environment ccg \(PTX5000\) on page 1094](#)

**Output Fields** [Table 100 on page 1093](#) lists the output fields for the **show chassis environment ccg** command. Output fields are listed in the approximate order in which they appear.

*Table 100: show chassis environment cb Output Fields*

Field Name	Field Description
<b>State</b>	Status of the CCG: <b>Online - Master clock</b> , <b>Online - Standby</b> , or <b>Offline</b> . If two CCGs are installed and online, one is functioning as the master clock, and the other is the standby clock.
<b>Temperature</b>	Temperature of the air flowing past the CCG.
<b>Power</b>	Power required and measured on the CCG. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
<b>BUS Revision</b>	Revision level of the generic bus device.

## Sample Output

### show chassis environment ccg (PTX5000)

```
user@host> show chassis environment ccg
```

#### CCG 0 status:

State	Online - Master clock
Temperature	31 degrees C / 87 degrees F
Power	
1.2 V bias	1200 mV
1.8 V	1799 mV
3.3 V	3300 mV
3.3 V bias	3300 mV
Bus Revision	103

#### CCG 1 status:

State	Offline
Power	Disabled
Temperature	31 degrees C / 87 degrees F
Power	
1.2 V bias	1198 mV
1.8 V	161 mV
3.3 V	451 mV
3.3 V bias	3311 mV
Bus Revision	103



## show chassis environment fan

<b>Syntax</b>	<pre>show chassis environment fan &lt;all-members&gt; &lt;fantray-slot-number&gt; &lt;local&gt; &lt;member member-id&gt;</pre>
<b>Release Information</b>	<p>Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.</p> <p><b>all-members</b>, <b>local</b>, and <b>member member-id</b> options introduced in Junos OS Release 15.1 for MX2020 and MX2010 routers.</p> <p>Command introduced in Junos OS Release 17.2 for PTX10008 Routers.</p> <p>Command introduced in Junos OS Release 18.2R1 for MX10008 Routers.</p>
<b>Description</b>	(MX2020 and MX2010 routers only) Display environmental information about the fans and fan trays.
<b>Options</b>	<p><b>none</b>—Display environmental information about all fans and fan trays.</p> <p><b>all-members</b>—(Optional) Display environmental information about the fan and fan trays in all members of the Virtual Chassis configuration.</p> <p><b>fantray-slot-number</b>—(Optional) Display environmental information about the specified fan tray. Replace <i>fantray-slot-number</i> with a value from 0 through 3.</p> <p><b>local</b>—(Optional) Display environmental information about the fans and fan trays in the local member of the Virtual Chassis.</p> <p><b>member member-id</b>—(Optional) Display environmental information about the fans and fan trays in the specified member of the Virtual Chassis. Replace <i>member-id</i> with the value 0 or 1.</p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">show chassis environment on page 969</a></li> <li>• <a href="#">show chassis fan on page 1352</a></li> </ul>
<b>List of Sample Output</b>	<p><a href="#">show chassis environment fan (MX2020 routers) on page 1096</a></p> <p><a href="#">show chassis environment fan 3 (MX2020 routers) on page 1097</a></p> <p><a href="#">show chassis environment fan (PTX10008 routers) on page 1097</a></p> <p><a href="#">show chassis environment fan (PTX10016 routers) on page 1097</a></p> <p><a href="#">show chassis environment fan (MX10008 routers) on page 1098</a></p>

**Output Fields** Table 99 on page 1069 lists the output fields for the **show chassis environment fan** command. Output fields are listed in the approximate order in which they appear.

*Table 101: show chassis environment fan Output Fields*

Field Name	Field Description
<b>Fan Tray Status</b>	Status of the fan tray.
<b>Temperature</b>	Temperature in Celsius (C) and Fahrenheit (F) maintained by the fans.
<b>Power</b>	Power required and measured on the fan tray. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
<b>Max Power Consumption</b>	Maximum power consumed by the fan tray.

## Sample Output

### show chassis environment fan (MX2020 routers)

```

user@host> show chassis environment fan

Fan Tray 0 status:
  Temperature      23 degrees C / 73 degrees F
  Power
    1.2 V          1189 mV
    3.3 V          3293 mV
    5.0 V          5230 mV
    5.0 V bias     5278 mV
    52.0 V A       49944 mV
    52.0 V B       435 mV
  Max Power Consumption 1150 Watts
Fan Tray 1 status:
  Temperature      22 degrees C / 71 degrees F
  Power
    1.2 V          1192 mV
    3.3 V          3300 mV
    5.0 V          5230 mV
    5.0 V bias     5230 mV
    52.0 V A       50205 mV
    52.0 V B       435 mV
  Max Power Consumption 1150 Watts
Fan Tray 2 status:
  Temperature      31 degrees C / 87 degrees F
  Power
    1.2 V          1192 mV
    3.3 V          3287 mV
    5.0 V          5211 mV
    5.0 V bias     5220 mV
    52.0 V A       50031 mV
    52.0 V B       435 mV
  Max Power Consumption 1150 Watts
Fan Tray 3 status:
  Temperature      31 degrees C / 87 degrees F
  Power
    1.2 V          1208 mV

```

3.3 V	3306 mV
5.0 V	5240 mV
5.0 V bias	5259 mV
52.0 V A	50553 mV
52.0 V B	435 mV
Max Power Consumption	1150 Watts

### show chassis environment fan 3 (MX2020 routers)

```
user@host> show chassis environment fan 3
```

```
Fan Tray 3 status:
  Temperature          31 degrees C / 87 degrees F
  Power
    1.2 V              1208 mV
    3.3 V              3306 mV
    5.0 V              5240 mV
    5.0 V bias         5259 mV
    52.0 V A           50553 mV
    52.0 V B           435 mV
  Max Power Consumption 1150 Watts
```

### show chassis environment fan (PTX10008 routers)

```
user@host> show chassis environment fan
```

```
Fan Tray 0 status:
  HS 0                12338 mV    4035 mA    40623 mW
  HS 1                12325 mV    3044 mA    36483 mW
  HS 2                12272 mV    3374 mA    38388 mW
  HS 3                12364 mV    2218 mA    37918 mW
  Temperature          28 degrees C / 82 degrees F

Fan Tray 1 status:
  HS 0                12232 mV    3209 mA    50455 mW
  HS 1                12311 mV    3760 mA    50196 mW
  HS 2                12311 mV    5356 mA    47397 mW
  HS 3                12259 mV    3264 mA    15807 mW
  Temperature          28 degrees C / 82 degrees F
```

### show chassis environment fan (PTX10016 routers)

```
user@host> show chassis environment fan
```

```
Aug 02 21:13:00
Fan Tray 0 status:
  HS 0                12364 mV    4200 mA    48926 mW
  HS 1                12285 mV    3264 mA    69885 mW
  HS 2                12285 mV    4365 mA    57559 mW
  HS 3                12259 mV    2714 mA    67768 mW
  Temperature          25 degrees C / 77 degrees F

Fan Tray 1 status:
  HS 0                12325 mV    1888 mA    76354 mW
  HS 1                12325 mV    5026 mA    70779 mW
  HS 2                12285 mV    4200 mA    50032 mW
```

HS 3	12311 mV	5246 mA	55630 mW
Temperature		24 degrees C / 75 degrees F	

#### show chassis environment fan (MX10008 routers)

```
user@host> show chassis environment fan
```

Fan Tray 0 status:			
HS 0	12298 mV	4200 mA	59676 mW
HS 1	12338 mV	4585 mA	48856 mW
HS 2	12325 mV	4530 mA	63863 mW
HS 3	12311 mV	2879 mA	37800 mW
Temperature	26 degrees C / 78 degrees F		
Fan Tray 1 status:			
HS 0	12298 mV	4145 mA	57559 mW
HS 1	12298 mV	2934 mA	60288 mW
HS 2	12325 mV	5026 mA	46715 mW
HS 3	12272 mV	1833 mA	47209 mW
Temperature	25 degrees C / 77 degrees F		

## show chassis environment fpc

**List of Syntax**    [Syntax on page 1099](#)  
                          [Syntax \(TX Matrix and TX Matrix Plus Routers\) on page 1099](#)  
                          [Syntax \(MX Series Routers\) on page 1099](#)  
                          [Syntax \(MX2010, MX10003, MX204, MX2008, and MX10008 Universal Routing Platforms\) on page 1099](#)  
                          [Syntax \(MX2020 Universal Routing Platforms\) on page 1099](#)  
                          [Syntax \(QFX Series\) on page 1099](#)  
                          [Syntax \(OCX Series\) on page 1099](#)  
                          [Syntax \(PTX3000 Series\) on page 1100](#)  
                          [Syntax \(PTX10008 Series\) on page 1100](#)  
                          [Syntax \(EX9251, EX9253 Switches\) on page 1100](#)

**Syntax**    `show chassis environment fpc  
<slot>`

**Syntax (TX Matrix and TX Matrix Plus Routers)**    `show chassis environment fpc  
<lcc number>  
<slot>`

**Syntax (MX Series Routers)**    `show chassis environment fpc  
<slot>  
<all-members>  
<local>  
<member member-id>`

**Syntax (MX2010, MX10003, MX204, MX2008, and MX10008 Universal Routing Platforms)**    `show chassis environment fpc  
<slot>`

**Syntax (MX2020 Universal Routing Platforms)**    `show chassis environment fpc  
<slot>  
<satellite [fpc-slot slot-id | device-alias alias-name]`

**Syntax (QFX Series)**    `show chassis environment fpc  
<fpc-slot>  
interconnect-device name`

**Syntax (OCX Series)**    `show chassis environment fpc  
<fpc-slot>`

<b>Syntax (PTX3000 Series)</b>	show chassis environment fpc <fpc-slot>
<b>Syntax (PTX10008 Series)</b>	show chassis environment fpc <fpc-slot>
<b>Syntax (EX9251, EX9253 Switches)</b>	show chassis environment fpc <fpc-slot>
<b>Release Information</b>	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for QFX Series.</p> <p>Command introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport Routers.</p> <p>Command introduced in Junos OS Release 12.1 for T4000 Core Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX 2010 and MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> <p><b>satellite</b> option introduced in Junos OS Release 14.2R3.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.2 for PTX10008 Routers.</p> <p>Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.4 for MX204 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 18.1R1 for EX9251 switches.</p> <p>Command introduced in Junos OS Release 18.2 for EX9253 Switches.</p> <p>Command introduced in Junos OS Release 18.2R1 for MX10008 Universal Routing Platforms.</p>
<b>Description</b>	(M40e, M120, M160, M320, MX Series, T Series routers, EX Series, QFX Series, and PTX Series routers only) Display environmental information about Flexible PIC Concentrators (FPCs).
<b>Options</b>	<p><b>none</b>—Display environmental information about all FPCs. On a TX Matrix router, display environmental information about all FPCs on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display environmental information about all FPCs on the TX Matrix Plus router and its attached routers.</p> <p><b>all-members</b>—(MX Series routers only) (Optional) Display environmental information for the FPCs in all the members of the Virtual Chassis configuration.</p> <p><b>interconnect-device <i>name</i></b>—(QFabric systems only) (Optional) Display chassis environmental information for the Interconnect device.</p> <p><b>lcc <i>number</i></b>—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.</p>

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers only) (Optional) Display environmental information for the FPCs in the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Display environmental information for the FPCs in the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

**satellite [*fpc-slot slot-id* | *device-alias alias-name*]**—(Junos Fusion only)(Optional) Display environmental information for the FPCs in the specified satellite device in a Junos Fusion, or for all satellite devices in the Junos Fusion if no satellite devices are specified.

***slot* or *fpc-slot***—(Optional) Display environmental information about an individual FPC:

- (TX Matrix and TX Matrix Plus routers only) On a TX Matrix router, if you specify the number of the T640 router by using only the **lcc *number*** option (the recommended method), replace ***slot*** with a value from 0 through 7. Similarly, on a TX Matrix Plus router, if you specify the number of the router by using only the **lcc *number*** option (the recommended method), replace ***slot*** with a value from 0 through 7. Otherwise, replace ***slot*** with a value from 0 through 31. For example, the following commands have the same result:

```
user@host> show chassis environment fpc 1 lcc 1
user@host> show chassis environment fpc 9
```

- M120 router—Replace ***slot*** with a value from 0 through 5.
- MX240 router—Replace ***slot*** with a value from 0 through 2.
- MX480 router—Replace ***slot*** with a value from 0 through 5.
- MX960 router—Replace ***slot*** with a value from 0 through 11.
- MX2010 router—Replace ***slot*** with a value from 0 through 9.
- MX2020 router—Replace ***slot*** with a value from 0 through 19.
- MX2008 router—Replace ***slot*** with a value from 0 through 9.
- Other routers—Replace ***slot*** with a value from 0 through 7.

- EX Series switches:
  - EX3200 switches and EX4200 standalone switches—Replace **slot** with 0.
  - EX4200 switches in a Virtual Chassis configuration—Replace **slot** with a value from 0 through 9 (switch's member ID).
  - EX6210 switches—Replace **slot** with a value from 0 through 3 (line card only), 4 or 5 (line card or Switch Fabric and Rotuing Engine (SRE) module), or 6 through 9 (line card only).
  - EX8208 switches—Replace **slot** with a value from 0 through 7 (line card).
  - EX8216 switches—Replace **slot** with a value from 0 through 15 (line card).
- QFX3500 switches —Replace **fpc-slot** with 0 through 15.
- PTX5000 Packet Transport Router—Replace **fpc-slot** with 0 through 7.
- PTX3000 Packet Transport Router—Replace **fpc-slot** with 0 through 15.

**Required Privilege Level** view

- Related Documentation**
- [request chassis fpc on page 858](#)
  - [show chassis fpc on page 1666](#)
  - [show chassis fpc-feb-connectivity on page 1723](#)
  - [Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 479](#)
  - [MX960 Flexible PIC Concentrator Description](#)

- List of Sample Output**
- [show chassis environment fpc \(M120 Router\) on page 1104](#)
  - [show chassis environment fpc \(M160 Router\) on page 1105](#)
  - [show chassis environment fpc \(M320 Router\) on page 1106](#)
  - [show chassis environment fpc \(MX2020 Router\) on page 1106](#)
  - [show chassis environment fpc \(MX2010 Router\) on page 1109](#)
  - [show chassis environment fpc \(MX2008 Router\) on page 1112](#)
  - [show chassis environment fpc \(MX240 Router\) on page 1115](#)
  - [show chassis environment fpc \(MX480 Router\) on page 1117](#)
  - [show chassis environment fpc \(MX960 Router\) on page 1117](#)
  - [show chassis environment fpc \(MX480 Router with 100-Gigabit Ethernet CFP\) on page 1118](#)
  - [show chassis environment fpc \(MX240, MX480, MX960 with Application Services Modular Line Card on page 1119](#)
  - [show chassis environment fpc \(MX10003 Router\) on page 1120](#)
  - [show chassis environment fpc \(MX204 Router\) on page 1123](#)
  - [show chassis environment fpc \(MX10008 Router\) on page 1124](#)
  - [show chassis environment fpc \(T320, T640, and T1600 Routers\) on page 1131](#)



[show chassis environment fpc \(T4000 Router\) on page 1132](#)  
[show chassis environment fpc lcc \(TX Matrix Router\) on page 1136](#)  
[show chassis environment fpc lcc \(TX Matrix Plus Router\) on page 1137](#)  
[show chassis environment fpc \(QFX Series and OCX Series\) on page 1138](#)  
[show chassis environment fpc interconnect-device \(QFabric Systems\) on page 1138](#)  
[show chassis environment fpc 5 \(PTX3000 Packet Transport Router\) on page 1139](#)  
[show chassis environment fpc 0 \(PTX5000 Packet Transport Router\) on page 1139](#)  
[show chassis environment fpc 07 \(PTX5000 Packet Transport Router with FPC2-PTX-PIA\) on page 1140](#)  
[show chassis environment fpc \(PTX10008 router\) on page 1141](#)  
[show chassis environment fpc \(PTX10016 router\) on page 1145](#)  
[show chassis environment FPC 1 \(MX Routers with Media Services Blade \[MSB\]\) on page 1148](#)  
[show chassis environment fpc \(EX9251 Switches\) on page 1148](#)  
[show chassis environment fpc \(EX9253 Switches\) on page 1148](#)

**Output Fields** Table 102 on page 1103 lists the output fields for the **show chassis environment fpc** command. Output fields are listed in the approximate order in which they appear.

*Table 102: show chassis environment fpc Output Fields*

Field Name	Field Description
<b>State</b>	Status of the FPC: <ul style="list-style-type: none"> <li>• <b>Unknown</b>—FPC is not detected by the router.</li> <li>• <b>Empty</b>—No FPC is present.</li> <li>• <b>Present</b>—FPC is detected by the chassis daemon but is either not supported by the current version of the Junos OS, or the FPC is coming up but not yet online.</li> <li>• <b>Ready</b>—FPC is in intermediate or transition state.</li> <li>• <b>Announce online</b>—Intermediate state during which the FPC is coming up but not yet online, and the chassis manager acknowledges the chassisd FPC online initiative.</li> <li>• <b>Online</b>—FPC is online and running.</li> <li>• <b>Offline</b>—FPC is powered down.</li> <li>• <b>Diagnostics</b>—FPC is set to operate in diagnostics mode.</li> </ul>
<b>Temperature</b>	(M40e and M160 routers and QFX Series only) Temperature of the air flowing past the FPC.
<b>PMB Temperature</b>	(PTX Series only) Temperature of the air flowing past the PMB (bottom of the FPC).  The PTX5000 Packet Transport Router with FPC2-PTX-PIA include multiple temperatures for PMB ( <b>TEMPO</b> and <b>TEMP1</b> ).
<b>PMB CPU Temperature</b>	(PTX5000 Packet Transport Router with FPC2-PTX-PIA only) Temperature of the air flowing past the PMB CPU.
<b>Temperature Intake</b>	(M320 routers, MX2010 routers, MX2020 routers, MX2008 routers, and PTX Series only) Temperature of the air flowing into the chassis.
<b>Temperature Top</b>	(T Series routers only) Temperature of the air flowing past the top of the FPC.

Table 102: show chassis environment fpc Output Fields (continued)

Field Name	Field Description
<b>Temperature Exhaust</b>	(M120 and M320 routers, MX2010 routers, MX2020 routers, MX2008 routers, and PTX Series only) Temperature of the air flowing out of the chassis.  The PTX Series Packet Transport Routers, and the MX2010, MX2020, and MX2008 routers include exhaust temperatures for multiple zones ( <b>Exhaust A</b> and <b>Exhaust B</b> ).
<b>Temperature Bottom</b>	(T Series routers only) Temperature of the air flowing past the bottom of the FPC.
<b>TL n Temperature</b>	(PTX Series only) Temperature of the air flowing past the specified TL area of the packet forwarding engine (PFE) on the FPC.
<b>TQ n Temperature</b>	(PTX Series only) Temperature of the air flowing past the specified TQ area of the packet forwarding engine (PFE) on the FPC.
<b>Temperature MMBO</b>	(T640 router only) Temperature of the air flowing past the type 3 FPC.
<b>Temperature MMB1</b>	(M320 and T Series routers only) Temperature of the air flowing past the type 1, type 2, and type 3 FPC.
<b>Power</b>	Information about the voltage supplied to the FPC. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
<b>CMB Revision or BUS revision</b>	Revision level of the chassis management bus device (M Series router) or bus (T Series routers).

## Sample Output

### show chassis environment fpc (M120 Router)

```

user@host> show chassis environment fpc

FPC 2 status:
  State                Online
  Temperature Exhaust A 32 degrees C / 89 degrees F
  Temperature Exhaust B 31 degrees C / 87 degrees F
  Power A-Board
    1.2 V                1202 mV
    1.5 V                1508 mV
    1.8 V                1798 mV
    2.5 V                2507 mV
    3.3 V                3351 mV
    5.0 V                4995 mV
    3.3 V bias           3296 mV
    1.2 V Rocket IO      1205 mV
    1.5 V Rocket IO      1501 mV
  I2C Slave Revision    12
FPC 3 status:
  State                Online
  Temperature Exhaust A 31 degrees C / 87 degrees F
  Temperature Exhaust B 33 degrees C / 91 degrees F
  Power A-Board
    1.2 V                1211 mV

```

```

1.5 V          1501 mV
1.8 V          1798 mV
2.5 V          2471 mV
3.3 V          3293 mV
5.0 V          4930 mV
3.3 V bias     3296 mV
1.2 V Rocket IO 1205 mV
1.5 V Rocket IO 1501 mV
Power B-Board
1.2 V          1214 mV
1.5 V          1501 mV
2.5 V          2471 mV
3.3 V          3300 mV
5.0 V          4943 mV
3.3 V bias     3296 mV
1.2 V Rocket IO 1205 mV
1.5 V Rocket IO 1501 mV
I2C Slave Revision 12
FPC 4 status:
State          Online
Temperature Exhaust A 32 degrees C / 89 degrees F
Temperature Exhaust B 30 degrees C / 86 degrees F
Power A-Board
1.2 V          1195 mV
1.5 V          1504 mV
1.8 V          1801 mV
2.5 V          2504 mV
3.3 V          3293 mV
5.0 V          4917 mV
3.3 V bias     3296 mV
1.2 V Rocket IO 1202 mV
1.5 V Rocket IO 1492 mV
I2C Slave Revision 12

```

### show chassis environment fpc (M160 Router)

```

user@host> show chassis environment fpc

FPC 0 status:
State          Online
Temperature          42 degrees C / 107 degrees F
Power:
1.5 V          1500 mV
2.5 V          2509 mV
3.3 V          3308 mV
5.0 V          4991 mV
5.0 V bias     4952 mV
8.0 V bias     8307 mV
CMB Revision     12
FPC 1 status:
State          Online
Temperature          45 degrees C / 113 degrees F
Power:
1.5 V          1498 mV
2.5 V          2501 mV
3.3 V          3319 mV
5.0 V          5020 mV
5.0 V bias     5025 mV
8.0 V bias     8307 mV
CMB Revision     12

```

## show chassis environment fpc (M320 Router)

```

user@host> show chassis environment fpc

FPC 0 status:
  State                Online
  Temperature Intake    27 degrees C / 80 degrees F
  Temperature Exhaust   38 degrees C / 100 degrees F
  Temperature MMB1      31 degrees C / 87 degrees F
  Power:
    1.5 V                1487 mV
    1.5 V *              1494 mV
    1.8 V                1821 mV
    2.5 V                2533 mV
    3.3 V                3323 mV
    5.0 V                5028 mV
    3.3 V bias           3296 mV
    5.0 V bias           4984 mV
  CMB Revision          16
FPC 1 status:
  State                Online
  Temperature Intake    27 degrees C / 80 degrees F
  Temperature Exhaust   37 degrees C / 98 degrees F
  Temperature MMB1      32 degrees C / 89 degrees F
  Power:
    1.5 V                1504 mV
    1.5 V *              1499 mV
    1.8 V                1820 mV
    2.5 V                2529 mV
    3.3 V                3328 mV
    5.0 V                5013 mV
    3.3 V bias           3294 mV
    5.0 V bias           4984 mV
  CMB Revision          16
FPC 2 status:
  State                Online
  Temperature Intake    28 degrees C / 82 degrees F
  Temperature Exhaust   38 degrees C / 100 degrees F
  Temperature MMB1      32 degrees C / 89 degrees F
  Power:
    1.5 V                1498 mV
    1.5 V *              1487 mV
    1.8 V                1816 mV
    2.5 V                2531 mV
    3.3 V                3324 mV
    5.0 V                5025 mV
    3.3 V bias           3277 mV
    5.0 V bias           5013 mV
  CMB Revision          17
FPC 3 status:
...

```

## show chassis environment fpc (MX2020 Router)

```

user@host> show chassis environment fpc

FPC 0 status:
  State                Online
  Temperature Intake    41 degrees C / 105 degrees F
  Temperature Exhaust A 48 degrees C / 118 degrees F

```

```

Temperature Exhaust B      60 degrees C / 140 degrees F
Temperature LU 0 TSen      56 degrees C / 132 degrees F
Temperature LU 0 Chip      59 degrees C / 138 degrees F
Temperature LU 1 TSen      56 degrees C / 132 degrees F
Temperature LU 1 Chip      61 degrees C / 141 degrees F
Temperature LU 2 TSen      56 degrees C / 132 degrees F
Temperature LU 2 Chip      52 degrees C / 125 degrees F
Temperature LU 3 TSen      56 degrees C / 132 degrees F
Temperature LU 3 Chip      52 degrees C / 125 degrees F
Temperature MQ 0 TSen      49 degrees C / 120 degrees F
Temperature MQ 0 Chip      49 degrees C / 120 degrees F
Temperature MQ 1 TSen      49 degrees C / 120 degrees F
Temperature MQ 1 Chip      52 degrees C / 125 degrees F
Temperature MQ 2 TSen      49 degrees C / 120 degrees F
Temperature MQ 2 Chip      45 degrees C / 113 degrees F
Temperature MQ 3 TSen      49 degrees C / 120 degrees F
Temperature MQ 3 Chip      46 degrees C / 114 degrees F
Power
  AS-BIAS3V3-z12105      3299 mV
  AS-VDD1V8-z12006      1807 mV
  AS-VDD2V5-z12006      2512 mV
  AS-AVDD1V0-z12004      997 mV
  AS-PCIE_1V0-z12004      996 mV
  AS-VDD3V3-z12004      3294 mV
  AS-VDD_1V5A-z12004      1501 mV
  AS-VDD_1V5B-z12004      1498 mV
  AS-LU0_1V0-z12004      998 mV
  AS-LU1_1V0-z12004      1002 mV
  AS-MQ0_1V0-z12004      999 mV
  AS-MQ1_1V0-z12004      994 mV
  AS-LU2_1V0-z12004      1000 mV
  AS-LU3_1V0-z12004      998 mV
  AS-MQ2_1V0-z12004      1002 mV
  AS-MQ3_1V0-z12004      999 mV
  AS-PMB_1V1-z12006      1096 mV
I2C Slave Revision      68
FPC 1 status:
  State      Online
  Temperature Intake      39 degrees C / 102 degrees F
  Temperature Exhaust A    48 degrees C / 118 degrees F
  Temperature Exhaust B    55 degrees C / 131 degrees F
  Temperature LU 0 TSen    52 degrees C / 125 degrees F
  Temperature LU 0 Chip    54 degrees C / 129 degrees F
  Temperature LU 1 TSen    52 degrees C / 125 degrees F
  Temperature LU 1 Chip    56 degrees C / 132 degrees F
  Temperature LU 2 TSen    52 degrees C / 125 degrees F
  Temperature LU 2 Chip    49 degrees C / 120 degrees F
  Temperature LU 3 TSen    52 degrees C / 125 degrees F
  Temperature LU 3 Chip    50 degrees C / 122 degrees F
  Temperature MQ 0 TSen    48 degrees C / 118 degrees F
  Temperature MQ 0 Chip    48 degrees C / 118 degrees F
  Temperature MQ 1 TSen    48 degrees C / 118 degrees F
  Temperature MQ 1 Chip    51 degrees C / 123 degrees F
  Temperature MQ 2 TSen    48 degrees C / 118 degrees F
  Temperature MQ 2 Chip    45 degrees C / 113 degrees F
  Temperature MQ 3 TSen    48 degrees C / 118 degrees F
  Temperature MQ 3 Chip    45 degrees C / 113 degrees F
Power
  AS-BIAS3V3-z12105      3291 mV
  AS-VDD1V8-z12006      1786 mV

```

AS-VDD2V5-z12006	2496 mV
AS-AVDD1V0-z12004	1000 mV
AS-PCIE_1V0-z12004	1000 mV
AS-VDD3V3-z12004	3294 mV
AS-VDD_1V5A-z12004	1500 mV
AS-VDD_1V5B-z12004	1498 mV
AS-LU0_1V0-z12004	1003 mV
AS-LU1_1V0-z12004	1000 mV
AS-MQ0_1V0-z12004	1000 mV
AS-MQ1_1V0-z12004	995 mV
AS-LU2_1V0-z12004	1002 mV
AS-LU3_1V0-z12004	997 mV
AS-MQ2_1V0-z12004	1000 mV
AS-MQ3_1V0-z12004	998 mV
AS-PMB_1V1-z12006	1096 mV
I2C Slave Revision	68
FPC 2 status:	
State	Online
Temperature Intake	39 degrees C / 102 degrees F
Temperature Exhaust A	48 degrees C / 118 degrees F
Temperature Exhaust B	58 degrees C / 136 degrees F
Temperature LU 0 TSen	55 degrees C / 131 degrees F
Temperature LU 0 Chip	57 degrees C / 134 degrees F
Temperature LU 1 TSen	55 degrees C / 131 degrees F
Temperature LU 1 Chip	63 degrees C / 145 degrees F
Temperature LU 2 TSen	55 degrees C / 131 degrees F
Temperature LU 2 Chip	51 degrees C / 123 degrees F
Temperature LU 3 TSen	55 degrees C / 131 degrees F
Temperature LU 3 Chip	52 degrees C / 125 degrees F
Temperature MQ 0 TSen	48 degrees C / 118 degrees F
Temperature MQ 0 Chip	50 degrees C / 122 degrees F
Temperature MQ 1 TSen	48 degrees C / 118 degrees F
Temperature MQ 1 Chip	52 degrees C / 125 degrees F
Temperature MQ 2 TSen	48 degrees C / 118 degrees F
Temperature MQ 2 Chip	47 degrees C / 116 degrees F
Temperature MQ 3 TSen	48 degrees C / 118 degrees F
Temperature MQ 3 Chip	47 degrees C / 116 degrees F
Power	
AS-BIAS3V3-z12105	3299 mV
AS-VDD1V8-z12006	1805 mV
AS-VDD2V5-z12006	2510 mV
AS-AVDD1V0-z12004	999 mV
AS-PCIE_1V0-z12004	998 mV
AS-VDD3V3-z12004	3296 mV
AS-VDD_1V5A-z12004	1492 mV
AS-VDD_1V5B-z12004	1497 mV
AS-LU0_1V0-z12004	997 mV
AS-LU1_1V0-z12004	1000 mV
AS-MQ0_1V0-z12004	998 mV
AS-MQ1_1V0-z12004	1001 mV
AS-LU2_1V0-z12004	996 mV
AS-LU3_1V0-z12004	995 mV
AS-MQ2_1V0-z12004	998 mV
AS-MQ3_1V0-z12004	997 mV
AS-PMB_1V1-z12006	1100 mV
I2C Slave Revision	68
FPC 3 status:	
State	Online
Temperature Intake	41 degrees C / 105 degrees F
Temperature Exhaust A	48 degrees C / 118 degrees F

```

Temperature Exhaust B      58 degrees C / 136 degrees F
Temperature LU 0 TSen      56 degrees C / 132 degrees F
Temperature LU 0 Chip      59 degrees C / 138 degrees F
Temperature LU 1 TSen      56 degrees C / 132 degrees F
Temperature LU 1 Chip      61 degrees C / 141 degrees F
Temperature LU 2 TSen      56 degrees C / 132 degrees F
Temperature LU 2 Chip      51 degrees C / 123 degrees F
Temperature LU 3 TSen      56 degrees C / 132 degrees F
Temperature LU 3 Chip      53 degrees C / 127 degrees F
Temperature MQ 0 TSen      50 degrees C / 122 degrees F
Temperature MQ 0 Chip      51 degrees C / 123 degrees F
Temperature MQ 1 TSen      50 degrees C / 122 degrees F
Temperature MQ 1 Chip      55 degrees C / 131 degrees F
Temperature MQ 2 TSen      50 degrees C / 122 degrees F
Temperature MQ 2 Chip      47 degrees C / 116 degrees F
Temperature MQ 3 TSen      50 degrees C / 122 degrees F
Temperature MQ 3 Chip      50 degrees C / 122 degrees F
Power
  AS-BIAS3V3-z12105        3305 mV
  AS-VDD1V8-z12006         1810 mV
  AS-VDD2V5-z12006         2508 mV
  AS-AVDD1V0-z12004         999 mV
  AS-PCIE_1V0-z12004        1001 mV
  AS-VDD3V3-z12004         3294 mV
  AS-VDD_1V5A-z12004        1500 mV
  AS-VDD_1V5B-z12004        1498 mV
  AS-LU0_1V0-z12004         998 mV
  AS-LU1_1V0-z12004         998 mV
  AS-MQ0_1V0-z12004         999 mV
  AS-MQ1_1V0-z12004         998 mV
  AS-LU2_1V0-z12004        1000 mV
  AS-LU3_1V0-z12004        1001 mV
  AS-MQ2_1V0-z12004         996 mV
  AS-MQ3_1V0-z12004         998 mV
  AS-PMB_1V1-z12006        1098 mV
I2C Slave Revision        68
FPC 4 status:
...
```

### show chassis environment fpc (MX2010 Router)

```
user@host> show chassis environment fpc
```

```

FPC 0 status:
State      Online
Temperature Intake      36 degrees C / 96 degrees F
Temperature Exhaust A   42 degrees C / 107 degrees F
Temperature Exhaust B   51 degrees C / 123 degrees F
Temperature LU 0 TSen    49 degrees C / 120 degrees F
Temperature LU 0 Chip    50 degrees C / 122 degrees F
Temperature LU 1 TSen    49 degrees C / 120 degrees F
Temperature LU 1 Chip    54 degrees C / 129 degrees F
Temperature LU 2 TSen    49 degrees C / 120 degrees F
Temperature LU 2 Chip    45 degrees C / 113 degrees F
Temperature LU 3 TSen    49 degrees C / 120 degrees F
Temperature LU 3 Chip    46 degrees C / 114 degrees F
Temperature MQ 0 TSen    40 degrees C / 104 degrees F
Temperature MQ 0 Chip    41 degrees C / 105 degrees F
Temperature MQ 1 TSen    40 degrees C / 104 degrees F
Temperature MQ 1 Chip    44 degrees C / 111 degrees F
```

Temperature MQ 2 TSen	40 degrees C / 104 degrees F
Temperature MQ 2 Chip	38 degrees C / 100 degrees F
Temperature MQ 3 TSen	40 degrees C / 104 degrees F
Temperature MQ 3 Chip	41 degrees C / 105 degrees F
Power	
AS-BIAS3V3-z12105	3300 mV
AS-VDD1V8-z12006	1805 mV
AS-VDD2V5-z12006	2505 mV
AS-AVDD1V0-z12004	998 mV
AS-PCIE_1V0-z12004	999 mV
AS-VDD3V3-z12004	3303 mV
AS-VDD_1V5A-z12004	1497 mV
AS-VDD_1V5B-z12004	1497 mV
AS-LU0_1V0-z12004	998 mV
AS-LU1_1V0-z12004	1003 mV
AS-MQ0_1V0-z12004	998 mV
AS-MQ1_1V0-z12004	998 mV
AS-LU2_1V0-z12004	997 mV
AS-LU3_1V0-z12004	1001 mV
AS-MQ2_1V0-z12004	996 mV
AS-MQ3_1V0-z12004	994 mV
AS-PMB_1V1-z12006	1097 mV
I2C Slave Revision	68
FPC 1 status:	
State	Online
Temperature Intake	34 degrees C / 93 degrees F
Temperature Exhaust A	46 degrees C / 114 degrees F
Temperature Exhaust B	54 degrees C / 129 degrees F
Temperature LU 0 TSen	45 degrees C / 113 degrees F
Temperature LU 0 Chip	55 degrees C / 131 degrees F
Temperature LU 1 TSen	45 degrees C / 113 degrees F
Temperature LU 1 Chip	44 degrees C / 111 degrees F
Temperature LU 2 TSen	45 degrees C / 113 degrees F
Temperature LU 2 Chip	50 degrees C / 122 degrees F
Temperature LU 3 TSen	45 degrees C / 113 degrees F
Temperature LU 3 Chip	58 degrees C / 136 degrees F
Temperature XM 0 TSen	45 degrees C / 113 degrees F
Temperature XM 0 Chip	51 degrees C / 123 degrees F
Temperature XF 0 TSen	45 degrees C / 113 degrees F
Temperature XF 0 Chip	63 degrees C / 145 degrees F
Temperature PLX Switch TSen	45 degrees C / 113 degrees F
Temperature PLX Switch Chip	47 degrees C / 116 degrees F
Power	
MPC-BIAS3V3-z12105	3300 mV
MPC-VDD3V3-z16100	3294 mV
MPC-VDD2V5-z16100	2505 mV
MPC-VDD1V8-z12004	1796 mV
MPC-AVDD1V0-z12004	991 mV
MPC-VDD1V2-z16100	1196 mV
MPC-VDD1V5A-z12004	1491 mV
MPC-VDD1V5B-z12004	1492 mV
MPC-XF_0V9-z12004	996 mV
MPC-PCIE_1V0-z16100	1003 mV
MPC-LU0_1V0-z12004	996 mV
MPC-LU1_1V0-z12004	996 mV
MPC-LU2_1V0-z12004	998 mV
MPC-LU3_1V0-z12004	994 mV
MPC-12VA-BMR453	12031 mV
MPC-12VB-BMR453	12003 mV
MPC-PMB_1V1-z12006	1104 mV



```

MPC-PMB_1V2-z12106      1194 mV
MPC-XM_OV9-vt273m       911 mV
I2C Slave Revision      110
FPC 8 status:
State                    Online
Temperature Intake       32 degrees C / 89 degrees F
Temperature Exhaust A    44 degrees C / 111 degrees F
Temperature Exhaust B    37 degrees C / 98 degrees F
Temperature LU 0 TCAM TSen 41 degrees C / 105 degrees F
Temperature LU 0 TCAM Chip 49 degrees C / 120 degrees F
Temperature LU 0 TSen     41 degrees C / 105 degrees F
Temperature LU 0 Chip     52 degrees C / 125 degrees F
Temperature MQ 0 TSen     41 degrees C / 105 degrees F
Temperature MQ 0 Chip     47 degrees C / 116 degrees F
Temperature LU 1 TCAM TSen 39 degrees C / 102 degrees F
Temperature LU 1 TCAM Chip 42 degrees C / 107 degrees F
Temperature LU 1 TSen     39 degrees C / 102 degrees F
Temperature LU 1 Chip     46 degrees C / 114 degrees F
Temperature MQ 1 TSen     39 degrees C / 102 degrees F
Temperature MQ 1 Chip     45 degrees C / 113 degrees F
Power
MPC-BIAS3V3-z12105      3296 mV
MPC-VDD3V3-z12006      3298 mV
MPC-VDD2V5-z12006      2505 mV
MPC-TCAM_1V0-z12004     997 mV
MPC-AVDD1V0-z12006     1007 mV
MPC-VDD1V8-z12006     1803 mV
MPC-PCIE_1V0-z12006    1004 mV
MPC-LU0_1V0-z12004     1000 mV
MPC-MQ0_1V0-z12004     999 mV
MPC-VDD_1V5-z12004     1498 mV
MPC-PMB_1V1-z12006     1102 mV
MPC-9VA-BMR453         9009 mV
MPC-9VB-BMR453         8960 mV
MPC-PMB_1V2-z12105     1202 mV
MPC-LU1_1V0-z12004     1005 mV
MPC-MQ1_1V0-z12004     1000 mV
I2C Slave Revision      70
FPC 9 status:
State                    Online
Temperature Intake       34 degrees C / 93 degrees F
Temperature Exhaust A    41 degrees C / 105 degrees F
Temperature Exhaust B    54 degrees C / 129 degrees F
Temperature LU 0 TSen     51 degrees C / 123 degrees F
Temperature LU 0 Chip     52 degrees C / 125 degrees F
Temperature LU 1 TSen     51 degrees C / 123 degrees F
Temperature LU 1 Chip     55 degrees C / 131 degrees F
Temperature LU 2 TSen     51 degrees C / 123 degrees F
Temperature LU 2 Chip     47 degrees C / 116 degrees F
Temperature LU 3 TSen     51 degrees C / 123 degrees F
Temperature LU 3 Chip     47 degrees C / 116 degrees F
Temperature MQ 0 TSen     40 degrees C / 104 degrees F
Temperature MQ 0 Chip     42 degrees C / 107 degrees F
Temperature MQ 1 TSen     40 degrees C / 104 degrees F
Temperature MQ 1 Chip     44 degrees C / 111 degrees F
Temperature MQ 2 TSen     40 degrees C / 104 degrees F
Temperature MQ 2 Chip     38 degrees C / 100 degrees F
Temperature MQ 3 TSen     40 degrees C / 104 degrees F
Temperature MQ 3 Chip     40 degrees C / 104 degrees F
Power

```

```

AS-BIAS3V3-z12105      3302 mV
AS-VDD1V8-z12006      1808 mV
AS-VDD2V5-z12006      2513 mV
AS-AVDD1V0-z12004      997 mV
AS-PCIE_1V0-z12004      999 mV
AS-VDD3V3-z12004      3294 mV
AS-VDD_1V5A-z12004     1503 mV
AS-VDD_1V5B-z12004     1502 mV
AS-LU0_1V0-z12004      996 mV
AS-LU1_1V0-z12004      999 mV
AS-MQ0_1V0-z12004      997 mV
AS-MQ1_1V0-z12004      999 mV
AS-LU2_1V0-z12004      997 mV
AS-LU3_1V0-z12004      998 mV
AS-MQ2_1V0-z12004     1000 mV
AS-MQ3_1V0-z12004     1000 mV
AS-PMB_1V1-z12006     1102 mV
I2C Slave Revision      68

```

### show chassis environment fpc (MX2008 Router)

```
user@host> show chassis environment fpc
```

```

FPC 0 status:
State                               Online
Temperature Intake                  29 degrees C / 84 degrees F
Temperature Exhaust A                43 degrees C / 109 degrees F
Temperature Exhaust B                42 degrees C / 107 degrees F
Temperature XL 0 TSen                38 degrees C / 100 degrees F
Temperature XL 0 Chip                53 degrees C / 127 degrees F
Temperature XL 0 XR2 0 TSen38 degrees C / 100 degrees F
Temperature XL 0 XR2 0 Chip60 degrees C / 140 degrees F
Temperature XL 0 XR2 1 TSen38 degrees C / 100 degrees F
Temperature XL 0 XR2 1 Chip60 degrees C / 140 degrees F
Temperature XL 1 TSen                30 degrees C / 86 degrees F
Temperature XL 1 Chip                43 degrees C / 109 degrees F
Temperature XL 1 XR2 0 TSen30 degrees C / 86 degrees F
Temperature XL 1 XR2 0 Chip50 degrees C / 122 degrees F
Temperature XL 1 XR2 1 TSen30 degrees C / 86 degrees F
Temperature XL 1 XR2 1 Chip50 degrees C / 122 degrees F
Temperature XM 0 TSen                42 degrees C / 107 degrees F
Temperature XM 0 Chip                49 degrees C / 120 degrees F
Temperature XM 1 TSen                42 degrees C / 107 degrees F
Temperature XM 1 Chip                42 degrees C / 107 degrees F
Temperature XM 2 TSen                42 degrees C / 107 degrees F
Temperature XM 2 Chip                42 degrees C / 107 degrees F
Temperature XM 3 TSen                42 degrees C / 107 degrees F
Temperature XM 3 Chip                40 degrees C / 104 degrees F
Temperature PCIE Switch TSen42 degrees C / 107 degrees F
Temperature PCIE Switch Chip22 degrees C / 71 degrees F
Power
MPC-VDD_3V3-vt273m                3304 mV
MPC-VDD_2V5-vt273m                2503 mV
MPC-VDD_1V5-vt273m                1499 mV
MPC-PCIE_0V9-vt273m                900 mV
MPC-VDD_1V8-vt273m                1799 mV
MPC-VDD_1V2-vt273m                1203 mV
MPC-XM01_AVDD_1V0-vt273            1001 mV
MPC-XM23_AVDD_1V0-vt273            1001 mV
MPC-XM0_0V9-vt273m                900 mV

```

```

MPC-XM1_0V9-vt273m      901 mV
MPC-XM2_0V9-vt273m      903 mV
MPC-XM3_0V9-vt273m      899 mV
MPC-XL0_XR0_0V9-vt273m  899 mV
MPC-XL0_XR1_0V9-vt273m  903 mV
MPC-XL0_0V9-vt273m      899 mV
MPC-XL0_AVDD_1V0-vt273m 1000 mV
MPC-XL0_VDD_1V5-vt273m  1498 mV
MPC-XL0_XR_1V2-vt273m   1200 mV
MPC-XL1_XR0_0V9-vt273m  899 mV
MPC-XL1_XR1_0V9-vt273m  899 mV
MPC-XL1_0V9-vt273m      900 mV
MPC-XL1_AVDD_1V0-vt273m 1000 mV
MPC-XL1_VDD_1V5-vt273m  1501 mV
MPC-XL1_XR_1V2-vt273m   1199 mV
MPC-PMB-1V05-ltc2978    1049 mV
MPC-PMB-1V5-ltc2978     1500 mV
MPC-PMB-2V5-ltc2978     2500 mV
MPC-PMB-3V3-ltc2978     3298 mV
I2C Slave Revision      20
FPC 1 status:
State                   Online
Temperature Intake      29 degrees C / 84 degrees F
Temperature Exhaust A   52 degrees C / 125 degrees F
Temperature Exhaust B   44 degrees C / 111 degrees F
Temperature EA0 TSen     55 degrees C / 131 degrees F
Temperature EA0 Chip     48 degrees C / 118 degrees F
Temperature EA0_XR0 TSen 55 degrees C / 131 degrees F
Temperature EA0_XR0 Chip 57 degrees C / 134 degrees F
Temperature EA0_XR1 TSen 55 degrees C / 131 degrees F
Temperature EA0_XR1 Chip 54 degrees C / 129 degrees F
Temperature EA1 TSen     55 degrees C / 131 degrees F
Temperature EA1 Chip     50 degrees C / 122 degrees F
Temperature EA1_XR0 TSen 55 degrees C / 131 degrees F
Temperature EA1_XR0 Chip 59 degrees C / 138 degrees F
Temperature EA1_XR1 TSen 55 degrees C / 131 degrees F
Temperature EA1_XR1 Chip 59 degrees C / 138 degrees F
Temperature PEX TSen     55 degrees C / 131 degrees F
Temperature PEX Chip     39 degrees C / 102 degrees F
Temperature EA2 TSen     43 degrees C / 109 degrees F
Temperature EA2 Chip     39 degrees C / 102 degrees F
Temperature EA2_XR0 TSen 43 degrees C / 109 degrees F
Temperature EA2_XR0 Chip 45 degrees C / 113 degrees F
Temperature EA2_XR1 TSen 43 degrees C / 109 degrees F
Temperature EA2_XR1 Chip 43 degrees C / 109 degrees F
Temperature EA3 TSen     43 degrees C / 109 degrees F
Temperature EA3 Chip     41 degrees C / 105 degrees F
Temperature EA3_XR0 TSen 43 degrees C / 109 degrees F
Temperature EA3_XR0 Chip 50 degrees C / 122 degrees F
Temperature EA3_XR1 TSen 43 degrees C / 109 degrees F
Temperature EA3_XR1 Chip 46 degrees C / 114 degrees F
Temperature EA0_HMC0 Logic die 61 degrees C / 141 degrees F
Temperature EA0_HMC0 DRAM botm 58 degrees C / 136 degrees F
Temperature EA0_HMC1 Logic die 62 degrees C / 143 degrees F
Temperature EA0_HMC1 DRAM botm 59 degrees C / 138 degrees F
Temperature EA0_HMC2 Logic die 59 degrees C / 138 degrees F
Temperature EA0_HMC2 DRAM botm 56 degrees C / 132 degrees F
Temperature EA1_HMC0 Logic die 67 degrees C / 152 degrees F
Temperature EA1_HMC0 DRAM botm 64 degrees C / 147 degrees F
Temperature EA1_HMC1 Logic die 65 degrees C / 149 degrees F

```

Temperature EA1\_HMC1 DRAM botm 62 degrees C / 143 degrees F  
 Temperature EA1\_HMC2 Logic die 63 degrees C / 145 degrees F  
 Temperature EA1\_HMC2 DRAM botm 60 degrees C / 140 degrees F  
 Temperature EA2\_HMC0 Logic die 51 degrees C / 123 degrees F  
 Temperature EA2\_HMC0 DRAM botm 48 degrees C / 118 degrees F  
 Temperature EA2\_HMC1 Logic die 55 degrees C / 131 degrees F  
 Temperature EA2\_HMC1 DRAM botm 52 degrees C / 125 degrees F  
 Temperature EA2\_HMC2 Logic die 52 degrees C / 125 degrees F  
 Temperature EA2\_HMC2 DRAM botm 49 degrees C / 120 degrees F  
 Temperature EA3\_HMC0 Logic die 51 degrees C / 123 degrees F  
 Temperature EA3\_HMC0 DRAM botm 48 degrees C / 118 degrees F  
 Temperature EA3\_HMC1 Logic die 52 degrees C / 125 degrees F  
 Temperature EA3\_HMC1 DRAM botm 49 degrees C / 120 degrees F  
 Temperature EA3\_HMC2 Logic die 52 degrees C / 125 degrees F  
 Temperature EA3\_HMC2 DRAM botm 49 degrees C / 120 degrees F

## Power

MPC-EA0_OV9-vt1527mb	950 mV
MPC-EA1_OV9-vt1527mb	950 mV
MPC-EA2_OV9-vt1527mb	925 mV
MPC-EA3_OV9-vt1527mb	924 mV
MAX20751-1V0	1020 mV
MAX20731-OV9	891 mV
MAX20751-EA0-AVDD1V0	1000 mV
MAX20731-EA0-1V2	1189 mV
MAX20731-EA0-HMC-1V2	1182 mV
MAX20731-EA0-OV906	899 mV
MAX20731-EA0-HMC-OV9	891 mV
MAX20751-EA1-AVDD1V0	1000 mV
MAX20731-EA1-1V2	1189 mV
MAX20731-EA1-HMC-1V2	1182 mV
MAX20731-EA1-OV906	899 mV
MAX20731-EA1-HMC-OV9	889 mV
MAX20751-EA2-AVDD1V0	1000 mV
MAX20731-EA2-1V2	1186 mV
MAX20731-EA2-HMC-1V2	1193 mV
MAX20731-EA2-OV906	899 mV
MAX20731-EA2-HMC-OV9	889 mV
MAX20751-EA3-AVDD1V0	1000 mV
MAX20731-EA3-1V2	1186 mV
MAX20731-EA3-HMC-1V2	1193 mV
MAX20731-EA3-OV906	897 mV
MAX20731-EA3-HMC-OV9	894 mV
MAX20731-3V3	3268 mV
UCD9090_0-CH_1-EA0_PLL_	1010 mV
UCD9090_0-CH_2-EA0_1V04	1038 mV
UCD9090_0-CH_3-EA0_2V5	2499 mV
UCD9090_0-CH_4-EA0_1V5	1494 mV
UCD9090_0-CH_5-EA1_PLL_	1012 mV
UCD9090_0-CH_6-EA1_1V04	1038 mV
UCD9090_0-CH_7-EA1_2V5	2497 mV
UCD9090_0-CH_8-EA1_1V5	1498 mV
UCD9090_0-CH_9-VDD_1V8	1804 mV
UCD9090_0-CH_10-VDD_2V5	2499 mV
UCD9090_1-CH_1-EA2_PLL_	1017 mV
UCD9090_1-CH_2-EA2_1V04	1041 mV
UCD9090_1-CH_3-EA2_2V5	2499 mV
UCD9090_1-CH_4-EA2_1V5	1503 mV
UCD9090_1-CH_5-EA3_PLL_	1015 mV
UCD9090_1-CH_6-EA3_1V04	1048 mV
UCD9090_1-CH_7-EA3_2V5	2499 mV

```

UCD9090_1-CH_8-EA3_1V5      1500 mV
UCD9090_1-CH_9-VDD_1V5      1497 mV
UCD9090_1-CH_10-VDD_1V2     1216 mV
PMB PVCC 0.7V - 1.05V       802 mV
PMB PVNN 0V - 1.02V         976 mV
PMB 1.0V                     1002 mV
PMB 1.1V                     1076 mV
PMB 1.35V                    1347 mV
PMB VDDQ 1.5V               1504 mV
PMB 1.8V                     1804 mV
PMB VDD 3.3V                3292 mV
PMB BIAS 5.0V               5008 mV
PMB USB 5.0V                5000 mV
PMB 12V                     10866 mV
I2C Slave Revision          112
FPC 7 status:
State                        Online
Temperature Intake           31 degrees C / 87 degrees F
Temperature Exhaust A       46 degrees C / 114 degrees F
Temperature Exhaust B       38 degrees C / 100 degrees F
Temperature QX 0 TSen        49 degrees C / 120 degrees F
Temperature QX 0 Chip        52 degrees C / 125 degrees F
Temperature LU 0 TCAM TSen   49 degrees C / 120 degrees F
Temperature LU 0 TCAM Chip   52 degrees C / 125 degrees F
Temperature LU 0 TSen        49 degrees C / 120 degrees F
Temperature LU 0 Chip        51 degrees C / 123 degrees F
Temperature MQ 0 TSen        49 degrees C / 120 degrees F
Temperature MQ 0 Chip        55 degrees C / 131 degrees F
Temperature QX 1 TSen        41 degrees C / 105 degrees F
Temperature QX 1 Chip        42 degrees C / 107 degrees F
Temperature LU 1 TCAM TSen   41 degrees C / 105 degrees F
Temperature LU 1 TCAM Chip   43 degrees C / 109 degrees F
Temperature LU 1 TSen        41 degrees C / 105 degrees F
Temperature LU 1 Chip        46 degrees C / 114 degrees F
Temperature MQ 1 TSen        41 degrees C / 105 degrees F
Temperature MQ 1 Chip        47 degrees C / 116 degrees F
Power
MPC-BIAS3V3-z12105          3302 mV
MPC-VDD3V3-z12006           3307 mV
MPC-VDD2V5-z12006           2505 mV
MPC-TCAM_1V0-z12004          1000 mV
MPC-AVDD1V0-z12006           1006 mV
MPC-VDD1V8-z12006           1800 mV
MPC-PCIE_1V0-z12006          1000 mV
MPC-LU0_1V0-z12004           997 mV
MPC-MQ0_1V0-z12004           999 mV
MPC-VDD_1V5-z12004           1495 mV
MPC-PMB_1V1-z12006           1096 mV
MPC-9VA-BMR453               9051 mV
MPC-9VB-BMR453               8990 mV
MPC-PMB_1V2-z12106           1200 mV
MPC-LU1_1V0-z12004           997 mV
MPC-MQ1_1V0-z12004           998 mV
MPC-QXM0_1V0-z12006          1000 mV
MPC-QXM1_1V0-z12006          999 mV
I2C Slave Revision          70

```

### show chassis environment fpc (MX240 Router)

```
user@host> show chassis environment fpc
```

## FPC 1 status:

State	Online
Temperature Intake	34 degrees C / 93 degrees F
Temperature Exhaust A	39 degrees C / 102 degrees F
Temperature Exhaust B	53 degrees C / 127 degrees F
Temperature I3 0 TSensor	51 degrees C / 123 degrees F
Temperature I3 0 Chip	54 degrees C / 129 degrees F
Temperature I3 1 TSensor	50 degrees C / 122 degrees F
Temperature I3 1 Chip	53 degrees C / 127 degrees F
Temperature I3 2 TSensor	48 degrees C / 118 degrees F
Temperature I3 2 Chip	51 degrees C / 123 degrees F
Temperature I3 3 TSensor	45 degrees C / 113 degrees F
Temperature I3 3 Chip	48 degrees C / 118 degrees F
Temperature IA 0 TSensor	45 degrees C / 113 degrees F
Temperature IA 0 Chip	45 degrees C / 113 degrees F
Temperature IA 1 TSensor	45 degrees C / 113 degrees F
Temperature IA 1 Chip	49 degrees C / 120 degrees F
Power	
1.5 V	1492 mV
2.5 V	2507 mV
3.3 V	3306 mV
1.8 V PFE 0	1801 mV
1.8 V PFE 1	1804 mV
1.8 V PFE 2	1798 mV
1.8 V PFE 3	1798 mV
1.2 V PFE 0	1169 mV
1.2 V PFE 1	1189 mV
1.2 V PFE 2	1182 mV
1.2 V PFE 3	1176 mV
I2C Slave Revision	42

## FPC 2 status:

State	Online
Temperature Intake	33 degrees C / 91 degrees F
Temperature Exhaust A	41 degrees C / 105 degrees F
Temperature Exhaust B	53 degrees C / 127 degrees F
Temperature I3 0 TSensor	53 degrees C / 127 degrees F
Temperature I3 0 Chip	58 degrees C / 136 degrees F
Temperature I3 1 TSensor	52 degrees C / 125 degrees F
Temperature I3 1 Chip	56 degrees C / 132 degrees F
Temperature I3 2 TSensor	50 degrees C / 122 degrees F
Temperature I3 2 Chip	52 degrees C / 125 degrees F
Temperature I3 3 TSensor	46 degrees C / 114 degrees F
Temperature I3 3 Chip	49 degrees C / 120 degrees F
Temperature IA 0 TSensor	51 degrees C / 123 degrees F
Temperature IA 0 Chip	49 degrees C / 120 degrees F
Temperature IA 1 TSensor	48 degrees C / 118 degrees F
Temperature IA 1 Chip	53 degrees C / 127 degrees F
Power	
1.5 V	1492 mV
2.5 V	2445 mV
3.3 V	3293 mV
1.8 V PFE 0	1827 mV
1.8 V PFE 1	1775 mV
1.8 V PFE 2	1788 mV
1.8 V PFE 3	1798 mV
1.2 V PFE 0	1250 mV
1.2 V PFE 1	1234 mV
1.2 V PFE 2	1231 mV
1.2 V PFE 3	1192 mV
I2C Slave Revision	42

**show chassis environment fpc (MX480 Router)**

```
user@host> show chassis environment fpc
```

```
FPC 1 status:
State                               Online
Temperature Intake                  36 degrees C / 96 degrees F
Temperature Exhaust A               41 degrees C / 105 degrees F
Temperature Exhaust B               55 degrees C / 131 degrees F
Temperature I3 0 TSensor            55 degrees C / 131 degrees F
Temperature I3 0 Chip               57 degrees C / 134 degrees F
Temperature I3 1 TSensor            53 degrees C / 127 degrees F
Temperature I3 1 Chip               53 degrees C / 127 degrees F
Temperature I3 2 TSensor            52 degrees C / 125 degrees F
Temperature I3 2 Chip               49 degrees C / 120 degrees F
Temperature I3 3 TSensor            47 degrees C / 116 degrees F
Temperature I3 3 Chip               47 degrees C / 116 degrees F
Temperature IA 0 TSensor            54 degrees C / 129 degrees F
Temperature IA 0 Chip               58 degrees C / 136 degrees F
Temperature IA 1 TSensor            48 degrees C / 118 degrees F
Temperature IA 1 Chip               53 degrees C / 127 degrees F
Power
  1.5 V                             1479 mV
  2.5 V                             2542 mV
  3.3 V                             3319 mV
  1.8 V PFE 0                       1811 mV
  1.8 V PFE 1                       1804 mV
  1.8 V PFE 2                       1804 mV
  1.8 V PFE 3                       1814 mV
  1.2 V PFE 0                       1192 mV
  1.2 V PFE 1                       1202 mV
  1.2 V PFE 2                       1205 mV
  1.2 V PFE 3                       1189 mV
I2C Slave Revision                  40
```

**show chassis environment fpc (MX960 Router)**

```
user@host> show chassis environment fpc
```

```
FPC 5 status:
State                               Online
Temperature Intake                  27 degrees C / 80 degrees F
Temperature Exhaust A               34 degrees C / 93 degrees F
Temperature Exhaust B               40 degrees C / 104 degrees F
Temperature I3 0 TSensor            39 degrees C / 102 degrees F
Temperature I3 0 Chip               41 degrees C / 105 degrees F
Temperature I3 1 TSensor            38 degrees C / 100 degrees F
Temperature I3 1 Chip               37 degrees C / 98 degrees F
Temperature I3 2 TSensor            37 degrees C / 98 degrees F
Temperature I3 2 Chip               34 degrees C / 93 degrees F
Temperature I3 3 TSensor            32 degrees C / 89 degrees F
Temperature I3 3 Chip               33 degrees C / 91 degrees F
Temperature IA 0 TSensor            39 degrees C / 102 degrees F
Temperature IA 0 Chip               44 degrees C / 111 degrees F
Temperature IA 1 TSensor            36 degrees C / 96 degrees F
Temperature IA 1 Chip               44 degrees C / 111 degrees F
Power
  1.5 V                             1479 mV
  2.5 V                             2523 mV
  3.3 V                             3254 mV
```

```

1.8 V PFE 0          1798 mV
1.8 V PFE 1          1798 mV
1.8 V PFE 2          1807 mV
1.8 V PFE 3          1791 mV
1.2 V PFE 0          1173 mV
1.2 V PFE 1          1179 mV
1.2 V PFE 2          1179 mV
1.2 V PFE 3          1185 mV
I2C Slave Revision   6
FPC 6 status:
State                Online
Temperature Intake    25 degrees C / 77 degrees F
Temperature Exhaust A 38 degrees C / 100 degrees F
Temperature Exhaust B 38 degrees C / 100 degrees F
Temperature I3 0 TSensor 40 degrees C / 104 degrees F
Temperature I3 0 Chip  40 degrees C / 104 degrees F
Temperature I3 1 TSensor 40 degrees C / 104 degrees F
Temperature I3 1 Chip  38 degrees C / 100 degrees F
Temperature I3 2 TSensor 37 degrees C / 98 degrees F
Temperature I3 2 Chip  32 degrees C / 89 degrees F
Temperature I3 3 TSensor 34 degrees C / 93 degrees F
Temperature I3 3 Chip  33 degrees C / 91 degrees F
Temperature IA 0 TSensor 45 degrees C / 113 degrees F
Temperature IA 0 Chip  47 degrees C / 116 degrees F
Temperature IA 1 TSensor 37 degrees C / 98 degrees F
Temperature IA 1 Chip  42 degrees C / 107 degrees F
Power
1.5 V                1485 mV
2.5 V                2510 mV
3.3 V                3332 mV
1.8 V PFE 0          1801 mV
1.8 V PFE 1          1814 mV
1.8 V PFE 2          1804 mV
1.8 V PFE 3          1820 mV
1.2 V PFE 0          1192 mV
1.2 V PFE 1          1189 mV
1.2 V PFE 2          1202 mV
1.2 V PFE 3          1156 mV
I2C Slave Revision   40

```

### show chassis environment fpc (MX480 Router with 100-Gigabit Ethernet CFP)

```
user@host> show chassis environment fpc
```

```

FPC 0 status:
State                Online
Temperature Intake    32 degrees C / 89 degrees F
Temperature Exhaust A 39 degrees C / 102 degrees F
Temperature Exhaust B 37 degrees C / 98 degrees F
Temperature QX 0 TSen 44 degrees C / 111 degrees F
Temperature QX 0 Chip 48 degrees C / 118 degrees F
Temperature LU 0 TCAM TSen 44 degrees C / 111 degrees F
Temperature LU 0 TCAM Chip 47 degrees C / 116 degrees F
Temperature LU 0 TSen 44 degrees C / 111 degrees F
Temperature LU 0 Chip 48 degrees C / 118 degrees F
Temperature MQ 0 TSen 44 degrees C / 111 degrees F
Temperature MQ 0 Chip 47 degrees C / 116 degrees F
Power
MPC-BIAS3V3-z12105   3297 mV
MPC-VDD3V3-z12105    3306 mV

```



```

MPC-VDD2V5-z12105      2498 mV
MPC-TCAM_1V0-z12004     999 mV
MPC-AVDD1V0-z12006      999 mV
MPC-VDD1V8-z12006      1796 mV
MPC-PCIE_1V0-z12006     1002 mV
MPC-LU0_1V0-z12004      997 mV
MPC-MQ0_1V0-z12004      995 mV
MPC-VDD_1V5-z12004      1496 mV
MPC-PMB_1V1-z12006      1094 mV
MPC-9VA-BMR453          9054 mV
MPC-9VB-BMR453          9037 mV
MPC-PMB_1V2-z12106      1191 mV
MPC-QXM0_1V0-z12006     1000 mV
I2C Slave Revision      66
FPC 1 status:
State                   Online
Temperature Intake      35 degrees C / 95 degrees F
Temperature Exhaust A   50 degrees C / 122 degrees F
Temperature Exhaust B   56 degrees C / 132 degrees F
Temperature LU 0 TSen    46 degrees C / 114 degrees F
Temperature LU 0 Chip    59 degrees C / 138 degrees F
Temperature LU 1 TSen    46 degrees C / 114 degrees F
Temperature LU 1 Chip    45 degrees C / 113 degrees F
Temperature LU 2 TSen    46 degrees C / 114 degrees F
Temperature LU 2 Chip    60 degrees C / 140 degrees F
Temperature LU 3 TSen    46 degrees C / 114 degrees F
Temperature LU 3 Chip    71 degrees C / 159 degrees F
Temperature XM 0 TSen    46 degrees C / 114 degrees F
Temperature XM 0 Chip    -18 degrees C / 0 degrees F
Temperature XF 0 TSen    46 degrees C / 114 degrees F
Temperature XF 0 Chip    76 degrees C / 168 degrees F
Power
MPC-BIAS3V3-z12105      3292 mV
MPC-VDD3V3-z16100       3303 mV
MPC-VDD2V5-z16100       2501 mV
MPC-VDD1V8-z12004       1801 mV
MPC-AVDD1V0-z12006      996 mV
MPC-VDD1V2-z16100       1199 mV
MPC-VDD1V5A-z12004      1493 mV
MPC-VDD1V5B-z12004      1498 mV
MPC-XF_0V9-z12006       996 mV
MPC-PCIE_1V0-z16100     1000 mV
MPC-LU0_1V0-z12004      994 mV
MPC-LU1_1V0-z12004      994 mV
MPC-LU2_1V0-z12004      992 mV
MPC-LU3_1V0-z12004      993 mV
MPC-12VA-BMR453         12003 mV
MPC-12VB-BMR453         12043 mV
MPC-PMB_1V1-z12006      1091 mV
MPC-PMB_1V2-z12106      1196 mV
MPC-XM_0V9-vt273m       899 mV
I2C Slave Revision      106

```

### show chassis environment fpc (MX240, MX480, MX960 with Application Services Modular Line Card)

```
user@host>show chassis environment fpc 1
```

```

FPC 1 status:
State                   Online
Temperature Intake      36 degrees C / 96 degrees F

```

```

Temperature Exhaust A      39 degrees C / 102 degrees F
Temperature LU TSen        52 degrees C / 125 degrees F
Temperature LU Chip        54 degrees C / 129 degrees F
Temperature XM TSen        52 degrees C / 125 degrees F
Temperature XM Chip        60 degrees C / 140 degrees F
Temperature PCIE TSen      52 degrees C / 125 degrees F
Temperature PCIE Chip      69 degrees C / 156 degrees F
Power
  MPC-BIAS3V3-z12106      3302 mV
  MPC-VDD3V3-z16100      3325 mV
  MPC-AVDD1V0-z16100      1007 mV
  MPC-PCIE_1V0-z16100     904 mV
  MPC-LU0_1V0-z12004      996 mV
  MPC-VDD_1V5-z12004      1498 mV
  MPC-12VA-BMR453         11733 mV
  MPC-12VB-BMR453         11728 mV
  MPC-XM_0V9-vt273m       900 mV
I2C Slave Revision        81

```

### show chassis environment fpc (MX10003 Router)

```
user@host> show chassis environment fpc
```

```

FPC 0 status:
State                               Online
FPC 0 Intake Temp Sensor 29 degrees C / 84 degrees F
FPC 0 Exhaust-A Temp Sensor56 degrees C / 132 degrees F
FPC 0 Exhaust-B Temp Sensor44 degrees C / 111 degrees F
FPC 0 EA0 Chip            58 degrees C / 136 degrees F
FPC 0 EA0-XR0 Chip        61 degrees C / 141 degrees F
FPC 0 EA0-XR1 Chip        62 degrees C / 143 degrees F
FPC 0 EA1 Chip            67 degrees C / 152 degrees F
FPC 0 EA1-XR0 Chip        72 degrees C / 161 degrees F
FPC 0 EA1-XR1 Chip        72 degrees C / 161 degrees F
FPC 0 PEX Chip            77 degrees C / 170 degrees F
FPC 0 EA2 Chip            48 degrees C / 118 degrees F
FPC 0 EA2-XR0 Chip        54 degrees C / 129 degrees F
FPC 0 EA2-XR1 Chip        56 degrees C / 132 degrees F
FPC 0 PF Chip            68 degrees C / 154 degrees F
FPC 0 EA0_HMC0 Logic die  72 degrees C / 161 degrees F
FPC 0 EA0_HMC0 DRAM botm  69 degrees C / 156 degrees F
FPC 0 EA0_HMC1 Logic die  71 degrees C / 159 degrees F
FPC 0 EA0_HMC1 DRAM botm  68 degrees C / 154 degrees F
FPC 0 EA0_HMC2 Logic die  75 degrees C / 167 degrees F
FPC 0 EA0_HMC2 DRAM botm  72 degrees C / 161 degrees F
FPC 0 EA1_HMC0 Logic die  81 degrees C / 177 degrees F
FPC 0 EA1_HMC0 DRAM botm  78 degrees C / 172 degrees F
FPC 0 EA1_HMC1 Logic die  80 degrees C / 176 degrees F
FPC 0 EA1_HMC1 DRAM botm  77 degrees C / 170 degrees F
FPC 0 EA1_HMC2 Logic die  82 degrees C / 179 degrees F
FPC 0 EA1_HMC2 DRAM botm  79 degrees C / 174 degrees F
FPC 0 EA2_HMC0 Logic die  60 degrees C / 140 degrees F
FPC 0 EA2_HMC0 DRAM botm  57 degrees C / 134 degrees F
FPC 0 EA2_HMC1 Logic die  61 degrees C / 141 degrees F
FPC 0 EA2_HMC1 DRAM botm  58 degrees C / 136 degrees F
FPC 0 EA2_HMC2 Logic die  63 degrees C / 145 degrees F
FPC 0 EA2_HMC2 DRAM botm  60 degrees C / 140 degrees F
Power
  LTC3887-PF-VDD0V9-RAIL  898 mV

```

LTC3887-PF-VDD0V9-DEV0-	898 mV
LTC3887-PF-VDD0V9-DEV0-	900 mV
LTC3887-PF-VDD0V9-DEV1-	899 mV
LTC3887-PF-VDD0V9-DEV1-	901 mV
LTC3887-PF-AVDD1V0-RAIL	998 mV
LTC3887-PF-AVDD1V0-CH0	998 mV
LTC3887-PF-AVDD1V0-CH1	999 mV
LTC3887-ETHSW-VDD1V0	1000 mV
LTC3887-VDD2V5	2499 mV
LTC3887-PCIE-VDD0V9	899 mV
LTC3887-V1P0	999 mV
LTC3887-PHY-VDD1V0-A	999 mV
LTC3887-3V3	3300 mV
LTC3887-VDD1V8	1799 mV
UCD9090_0-CH_1-EA0_PLL_	1005 mV
UCD9090_0-CH_2-EA0_1V4	1049 mV
UCD9090_0-CH_3-EA0_2V5	2499 mV
UCD9090_0-CH_4-EA0_1V5	1499 mV
UCD9090_0-CH_5-EA1_PLL_	999 mV
UCD9090_0-CH_6-EA1_1V4	1037 mV
UCD9090_0-CH_7-EA1_2V5	2499 mV
UCD9090_0-CH_8-EA1_1V5	1510 mV
UCD9090_0-CH_9-PVCC	797 mV
UCD9090_0-CH_10-PVNN	991 mV
UCD9090_1-CH_1-EA2_PLL_	1008 mV
UCD9090_1-CH_2-EA2_1V4	1009 mV
UCD9090_1-CH_3-EA2_2V5	2499 mV
UCD9090_1-CH_4-EA2_1V5	1513 mV
UCD9090_1-CH_5-1V0_PFP1	1009 mV
UCD9090_1-CH_6-V1P1	1075 mV
UCD9090_1-CH_7-V1P5	1531 mV
UCD9090_1-CH_8-V1P35	1359 mV
UCD9090_1-CH_9-VDD1V5	1511 mV
UCD9090_1-CH_10-VDD1V2	1210 mV
LTC3887-EA0-VDD0V9-RAIL	949 mV
LTC3887-EA0-VDD0V9-DEV0	949 mV
LTC3887-EA0-VDD0V9-DEV0	951 mV
LTC3887-EA0-VDD0V9-DEV1	949 mV
LTC3887-EA0-VDD0V9-DEV1	951 mV
LTC3887-EA0-VDD0V9R2-RA	947 mV
LTC3887-EA0-VDD0V9R2-CH	947 mV
LTC3887-EA0-VDD0V9R2-CH	949 mV
LTC3887-EA0-VDD1V0-RAIL	999 mV
LTC3887-EA0-VDD1V0-CH0	999 mV
LTC3887-EA0-VDD1V0-CH1	1001 mV
LTC3887-EA0-XR-VDD0V9	900 mV
LTC3887-EA0-XR-VDD1V2	1199 mV
LTC3887-EA0-HM1-VDD0V9	899 mV
LTC3887-EA0-HM-VDD1V2	1200 mV
LTC3887-EA0-HM-VDDM1V2	1199 mV
LTC3887-EA1-VDD0V9-RAIL	949 mV
LTC3887-EA1-VDD0V9-DEV0	952 mV
LTC3887-EA1-VDD0V9-DEV0	952 mV
LTC3887-EA1-VDD0V9-DEV1	951 mV
LTC3887-EA1-VDD0V9-DEV1	951 mV
LTC3887-EA1-VDD0V9R2-RA	948 mV
LTC3887-EA1-VDD0V9R2-CH	948 mV
LTC3887-EA1-VDD0V9R2-CH	950 mV
LTC3887-EA1-VDD1V0-RAIL	1000 mV
LTC3887-EA1-VDD1V0-CH0	1000 mV

LTC3887-EA1-VDD1V0-CH1	1001 mV
I2C Slave Revision	13
FPC 1 status:	
State	Online
FPC 1 Intake Temp Sensor	27 degrees C / 80 degrees F
FPC 1 Exhaust-A Temp Sensor	60 degrees C / 140 degrees F
FPC 1 Exhaust-B Temp Sensor	46 degrees C / 114 degrees F
FPC 1 EA0 Chip	63 degrees C / 145 degrees F
FPC 1 EA0-XR0 Chip	67 degrees C / 152 degrees F
FPC 1 EA0-XR1 Chip	68 degrees C / 154 degrees F
FPC 1 EA1 Chip	70 degrees C / 158 degrees F
FPC 1 EA1-XR0 Chip	75 degrees C / 167 degrees F
FPC 1 EA1-XR1 Chip	75 degrees C / 167 degrees F
FPC 1 PEX Chip	89 degrees C / 192 degrees F
FPC 1 EA2 Chip	49 degrees C / 120 degrees F
FPC 1 EA2-XR0 Chip	53 degrees C / 127 degrees F
FPC 1 EA2-XR1 Chip	56 degrees C / 132 degrees F
FPC 1 PF Chip	71 degrees C / 159 degrees F
FPC 1 EA0_HMC0 Logic die	74 degrees C / 165 degrees F
FPC 1 EA0_HMC0 DRAM botm	71 degrees C / 159 degrees F
FPC 1 EA0_HMC1 Logic die	78 degrees C / 172 degrees F
FPC 1 EA0_HMC1 DRAM botm	75 degrees C / 167 degrees F
FPC 1 EA0_HMC2 Logic die	78 degrees C / 172 degrees F
FPC 1 EA0_HMC2 DRAM botm	75 degrees C / 167 degrees F
FPC 1 EA1_HMC0 Logic die	84 degrees C / 183 degrees F
FPC 1 EA1_HMC0 DRAM botm	81 degrees C / 177 degrees F
FPC 1 EA1_HMC1 Logic die	82 degrees C / 179 degrees F
FPC 1 EA1_HMC1 DRAM botm	79 degrees C / 174 degrees F
FPC 1 EA1_HMC2 Logic die	85 degrees C / 185 degrees F
FPC 1 EA1_HMC2 DRAM botm	82 degrees C / 179 degrees F
FPC 1 EA2_HMC0 Logic die	62 degrees C / 143 degrees F
FPC 1 EA2_HMC0 DRAM botm	59 degrees C / 138 degrees F
FPC 1 EA2_HMC1 Logic die	60 degrees C / 140 degrees F
FPC 1 EA2_HMC1 DRAM botm	57 degrees C / 134 degrees F
FPC 1 EA2_HMC2 Logic die	65 degrees C / 149 degrees F
FPC 1 EA2_HMC2 DRAM botm	62 degrees C / 143 degrees F
Power	
LTC3887-PF-VDD0V9-RAIL	899 mV
LTC3887-PF-VDD0V9-DEV0-	899 mV
LTC3887-PF-VDD0V9-DEV0-	901 mV
LTC3887-PF-VDD0V9-DEV1-	899 mV
LTC3887-PF-VDD0V9-DEV1-	901 mV
LTC3887-PF-AVDD1V0-RAIL	998 mV
LTC3887-PF-AVDD1V0-CH0	998 mV
LTC3887-PF-AVDD1V0-CH1	999 mV
LTC3887-ETHSW-VDD1V0	999 mV
LTC3887-VDD2V5	2499 mV
LTC3887-PCIE-VDD0V9	900 mV
LTC3887-V1P0	1000 mV
LTC3887-PHY-VDD1V0-A	1000 mV
LTC3887-3V3	3300 mV
LTC3887-VDD1V8	1799 mV
UCD9090_0-CH_1-EA0_PLL_	1004 mV
UCD9090_0-CH_2-EA0_1V4	1004 mV
UCD9090_0-CH_3-EA0_2V5	2499 mV
UCD9090_0-CH_4-EA0_1V5	1511 mV
UCD9090_0-CH_5-EA1_PLL_	999 mV
UCD9090_0-CH_6-EA1_1V4	1008 mV
UCD9090_0-CH_7-EA1_2V5	2499 mV
UCD9090_0-CH_8-EA1_1V5	1510 mV

```

UCD9090_0-CH_9-PVCC      839 mV
UCD9090_0-CH_10-PVNN     1016 mV
UCD9090_1-CH_1-EA2_PLL_  1011 mV
UCD9090_1-CH_2-EA2_1V4   1046 mV
UCD9090_1-CH_3-EA2_2V5   2499 mV
UCD9090_1-CH_4-EA2_1V5   1501 mV
UCD9090_1-CH_5-1V0_PFP  1000 mV
UCD9090_1-CH_6-V1P1      1037 mV
UCD9090_1-CH_7-V1P5      1530 mV
UCD9090_1-CH_8-V1P35     1360 mV
UCD9090_1-CH_9-VDD1V5    1513 mV
UCD9090_1-CH_10-VDD1V2   1217 mV
LTC3887-EA0-VDD0V9-RAIL  949 mV
LTC3887-EA0-VDD0V9-DEV0   949 mV
LTC3887-EA0-VDD0V9-DEV0   951 mV
LTC3887-EA0-VDD0V9-DEV1   949 mV
LTC3887-EA0-VDD0V9-DEV1   952 mV
LTC3887-EA0-VDD0V9R2-RA   947 mV
LTC3887-EA0-VDD0V9R2-CH   947 mV
LTC3887-EA0-VDD0V9R2-CH   949 mV
LTC3887-EA0-VDD1V0-RAIL  1000 mV
LTC3887-EA0-VDD1V0-CH0    1000 mV
LTC3887-EA0-VDD1V0-CH1    1001 mV
LTC3887-EA0-XR-VDD0V9     899 mV
LTC3887-EA0-XR-VDD1V2    1200 mV
LTC3887-EA0-HM1-VDD0V9    899 mV
LTC3887-EA0-HM-VDD1V2     1199 mV
LTC3887-EA0-HM-VDDM1V2    1199 mV
LTC3887-EA1-VDD0V9-RAIL   948 mV
LTC3887-EA1-VDD0V9-DEV0   950 mV
LTC3887-EA1-VDD0V9-DEV0   950 mV
LTC3887-EA1-VDD0V9-DEV1   951 mV
LTC3887-EA1-VDD0V9-DEV1   951 mV
LTC3887-EA1-VDD0V9R2-RA   947 mV
LTC3887-EA1-VDD0V9R2-CH   947 mV
LTC3887-EA1-VDD0V9R2-CH   949 mV
LTC3887-EA1-VDD1V0-RAIL   1000 mV
LTC3887-EA1-VDD1V0-CH0    1000 mV
LTC3887-EA1-VDD1V0-CH1    1002 mV
I2C Slave Revision        99

```

### show chassis environment fpc (MX204 Router)

```
user@host> show chassis environment fpc
```

```

FPC 0 status:
State                               Online
FPC 0 EA0_HMC0 Logic die           77 degrees C / 170 degrees F
FPC 0 EA0_HMC0 DRAM botm           74 degrees C / 165 degrees F
FPC 0 EA0_HMC1 Logic die           80 degrees C / 176 degrees F
FPC 0 EA0_HMC1 DRAM botm           77 degrees C / 170 degrees F
FPC 0 EA0 Chip                     93 degrees C / 199 degrees F
FPC 0 EA0-XR0 Chip                 63 degrees C / 145 degrees F
FPC 0 EA0-XR1 Chip                 64 degrees C / 147 degrees F
Power
I2C Slave Revision                 0

```

## show chassis environment fpc (MX10008 Router)

```
user@host> show chassis environment fpc
```

```
FPC 0 status:
```

State	Online	
FPC 0 Intake-A Temp Sensor	32 degrees C / 89 degrees F	
FPC 0 Exhaust-A Temp Sensor	44 degrees C / 111 degrees F	
FPC 0 Exhaust-B Temp Sensor	50 degrees C / 122 degrees F	
FPC 0 EA0 Temp Sensor	67 degrees C / 152 degrees F	
FPC 0 EA0_XR0 Temp Sensor	69 degrees C / 156 degrees F	
FPC 0 EA0_XR1 Temp Sensor	73 degrees C / 163 degrees F	
FPC 0 EA1 Temp Sensor	61 degrees C / 141 degrees F	
FPC 0 EA1_XR0 Temp Sensor	65 degrees C / 149 degrees F	
FPC 0 EA1_XR1 Temp Sensor	63 degrees C / 145 degrees F	
FPC 0 EA2 Temp Sensor	69 degrees C / 156 degrees F	
FPC 0 EA2_XR0 Temp Sensor	73 degrees C / 163 degrees F	
FPC 0 EA2_XR1 Temp Sensor	72 degrees C / 161 degrees F	
FPC 0 EA3 Temp Sensor	64 degrees C / 147 degrees F	
FPC 0 EA3_XR0 Temp Sensor	66 degrees C / 150 degrees F	
FPC 0 EA3_XR1 Temp Sensor	66 degrees C / 150 degrees F	
FPC 0 EA4 Temp Sensor	70 degrees C / 158 degrees F	
FPC 0 EA4_XR0 Temp Sensor	72 degrees C / 161 degrees F	
FPC 0 EA4_XR1 Temp Sensor	72 degrees C / 161 degrees F	
FPC 0 EA5 Temp Sensor	58 degrees C / 136 degrees F	
FPC 0 EA5_XR0 Temp Sensor	61 degrees C / 141 degrees F	
FPC 0 EA5_XR1 Temp Sensor	64 degrees C / 147 degrees F	
FPC 0 EA0_HMC0 Logic die	75 degrees C / 167 degrees F	
FPC 0 EA0_HMC0 DRAM botm	72 degrees C / 161 degrees F	
FPC 0 EA0_HMC1 Logic die	76 degrees C / 168 degrees F	
FPC 0 EA0_HMC1 DRAM botm	73 degrees C / 163 degrees F	
FPC 0 EA0_HMC2 Logic die	77 degrees C / 170 degrees F	
FPC 0 EA0_HMC2 DRAM botm	74 degrees C / 165 degrees F	
FPC 0 EA1_HMC0 Logic die	72 degrees C / 161 degrees F	
FPC 0 EA1_HMC0 DRAM botm	69 degrees C / 156 degrees F	
FPC 0 EA1_HMC1 Logic die	73 degrees C / 163 degrees F	
FPC 0 EA1_HMC1 DRAM botm	70 degrees C / 158 degrees F	
FPC 0 EA1_HMC2 Logic die	72 degrees C / 161 degrees F	
FPC 0 EA1_HMC2 DRAM botm	69 degrees C / 156 degrees F	
FPC 0 EA2_HMC0 Logic die	80 degrees C / 176 degrees F	
FPC 0 EA2_HMC0 DRAM botm	77 degrees C / 170 degrees F	
FPC 0 EA2_HMC1 Logic die	81 degrees C / 177 degrees F	
FPC 0 EA2_HMC1 DRAM botm	78 degrees C / 172 degrees F	
FPC 0 EA2_HMC2 Logic die	80 degrees C / 176 degrees F	
FPC 0 EA2_HMC2 DRAM botm	77 degrees C / 170 degrees F	
FPC 0 EA3_HMC0 Logic die	77 degrees C / 170 degrees F	
FPC 0 EA3_HMC0 DRAM botm	74 degrees C / 165 degrees F	
FPC 0 EA3_HMC1 Logic die	78 degrees C / 172 degrees F	
FPC 0 EA3_HMC1 DRAM botm	75 degrees C / 167 degrees F	
FPC 0 EA3_HMC2 Logic die	77 degrees C / 170 degrees F	
FPC 0 EA3_HMC2 DRAM botm	74 degrees C / 165 degrees F	
FPC 0 EA4_HMC0 Logic die	80 degrees C / 176 degrees F	
FPC 0 EA4_HMC0 DRAM botm	77 degrees C / 170 degrees F	
FPC 0 EA4_HMC1 Logic die	81 degrees C / 177 degrees F	
FPC 0 EA4_HMC1 DRAM botm	78 degrees C / 172 degrees F	
FPC 0 EA4_HMC2 Logic die	80 degrees C / 176 degrees F	
FPC 0 EA4_HMC2 DRAM botm	77 degrees C / 170 degrees F	
FPC 0 EA5_HMC0 Logic die	69 degrees C / 156 degrees F	
FPC 0 EA5_HMC0 DRAM botm	66 degrees C / 150 degrees F	
FPC 0 EA5_HMC1 Logic die	68 degrees C / 154 degrees F	
FPC 0 EA5_HMC1 DRAM botm	65 degrees C / 149 degrees F	

```

FPC 0 EA5_HMC2 Logic die          68 degrees C / 154 degrees F
FPC 0 EA5_HMC2 DRAM botm         65 degrees C / 149 degrees F
Power
    12V SS 1          12259 mV      9841 mA  120642 mW
    12V SS 2          12259 mV     21054 mA  258104 mW
    12V SS 3          12285 mV      9841 mA  120902 mW
    12V SS 4          12232 mV     20968 mA  256496 mW
    12V SS 5          12179 mV     14993 mA  182614 mW
    VDD 1.0V_A        1000 mV     95375 mA   95375 mW
    VDD 1.0V_B         0 mV         0 mA      0 mW
    VDD 3.3V          3298 mV     12500 mA   41235 mW
    VDD 0.9V           894 mV      3569 mA    3192 mW
    ETH SW 1V          980 mV      4500 mA    4410 mW
    VDD 1.8V          1809 mV      895 mA    1619 mW
    PVCC               951 mV         0 mA      0 mW
    PVNN              1009 mV         0 mA      0 mW
    V1P0              1006 mV         0 mA      0 mW
    V1P1              1070 mV         0 mA      0 mW
    V1P3              1351 mV         0 mA      0 mW
    VDDQ              1500 mV         0 mA      0 mW
    V1P8              1816 mV         0 mA      0 mW
    VDD3V3             3296 mV         0 mA      0 mW
    V5V0_BIAS          5025 mV         0 mA      0 mW
    VDD12V0           12174 mV         0 mA      0 mW
    EA0 Core 0.9V       900 mV     40625 mA   36578 mW
    EA0 AVDD 1.0V      1000 mV     32500 mA   32500 mW
    EA0 HMC Core 0.9V   894 mV     10081 mA    9017 mW
    EA0 1.2V           1189 mV     15081 mA   17945 mW
    EA01_HMC_VDDM 1.2V 1193 mV      -151 mA    -180 mW
    EA0_XR 0.906V       905 mV     13802 mA   12496 mW
    EA1 Core 0.9V       900 mV     41000 mA   36916 mW
    EA1 AVDD 1.0V      1000 mV     28000 mA   28000 mW
    EA1 HMC Core 0.9V   897 mV      9848 mA    8835 mW
    EA1 1.2V           1197 mV     15313 mA   18332 mW
    EA0_PLL_1V0         1003 mV         0 mA      0 mW
    EA0_1V04            1032 mV         0 mA      0 mW
    EA0_2V5             2445 mV         0 mA      0 mW
    EA0_1V5             1512 mV         0 mA      0 mW
    EA1_PLL_1V0         1000 mV         0 mA      0 mW
    EA1_1V04            1051 mV         0 mA      0 mW
    EA1_2V5             2516 mV         0 mA      0 mW
    EA1_1V5             1503 mV         0 mA      0 mW
    EA1_XR 0.906V       908 mV     14151 mA   12850 mW
    EA2 Core 0.9V       899 mV     40625 mA   36538 mW
    EA2 AVDD 1.0V      1000 mV     27250 mA   27276 mW
    EA2 HMC Core 0.9V   897 mV      9616 mA    8627 mW
    EA2 1.2V           1193 mV     15779 mA   18832 mW
    EA23_HMC_VDDM 1.2V 1197 mV         81 mA      97 mW
    EA2_XR 0.906V       908 mV     14848 mA   13484 mW
    EA3 Core 0.9V       899 mV     40625 mA   36538 mW
    EA3 AVDD 1.0V      1000 mV     28000 mA   28000 mW
    EA3 HMC Core 0.9V   897 mV     10546 mA    9461 mW
    EA3 1.2V           1197 mV     15895 mA   19028 mW
    EA2_PLL_1V0         1025 mV         0 mA      0 mW
    EA2_1V04            1048 mV         0 mA      0 mW
    EA2_2V5             2516 mV         0 mA      0 mW
    EA2_1V5             1500 mV         0 mA      0 mW
    EA3_PLL_1V0         1009 mV         0 mA      0 mW
    EA3_1V04            1032 mV         0 mA      0 mW
    EA3_2V5            2551 mV         0 mA      0 mW

```

EA3_1V5	1496 mV	0 mA	0 mW
EA3_XR 0.906V	908 mV	15895 mA	14434 mW
EA4 Core 0.9V	900 mV	41000 mA	36916 mW
EA4 AVDD 1.0V	999 mV	31250 mA	31219 mW
EA4 HMC Core 0.9V	894 mV	9965 mA	8913 mW
EA4 1.2V	1197 mV	15779 mA	18889 mW
EA45_HMC_VDDM 1.2V	1197 mV	546 mA	654 mW
EA4_XR 0.906V	908 mV	15197 mA	13801 mW
EA5 Core 0.9V	900 mV	39750 mA	35790 mW
EA5 AVDD 1.0V	1000 mV	28000 mA	28000 mW
EA5 HMC Core 0.9V	897 mV	9965 mA	8940 mW
EA5 1.2V	1197 mV	15546 mA	18610 mW
EA4_PLL_1V0	1003 mV	0 mA	0 mW
EA4_1V04	1041 mV	0 mA	0 mW
EA4_2V5	2541 mV	0 mA	0 mW
EA4_1V5	1506 mV	0 mA	0 mW
EA5_PLL_1V0	1022 mV	0 mA	0 mW
EA5_1V04	1048 mV	0 mA	0 mW
EA5_2V5	2532 mV	0 mA	0 mW
EA5_1V5	1509 mV	0 mA	0 mW
VDD2V5	2503 mV	0 mA	0 mW
VDD1V5	1509 mV	0 mA	0 mW
VDD1V2	1206 mV	0 mA	0 mW
EA5_XR 0.906V	902 mV	14500 mA	13088 mW

FPC 2 status:

State	Online
FPC 2 Intake-A Temp Sensor	33 degrees C / 91 degrees F
FPC 2 Exhaust-A Temp Sensor	52 degrees C / 125 degrees F
FPC 2 Exhaust-B Temp Sensor	50 degrees C / 122 degrees F
FPC 2 EA0 Temp Sensor	72 degrees C / 161 degrees F
FPC 2 EA0_XR0 Temp Sensor	76 degrees C / 168 degrees F
FPC 2 EA0_XR1 Temp Sensor	79 degrees C / 174 degrees F
FPC 2 EA1 Temp Sensor	64 degrees C / 147 degrees F
FPC 2 EA1_XR0 Temp Sensor	68 degrees C / 154 degrees F
FPC 2 EA1_XR1 Temp Sensor	66 degrees C / 150 degrees F
FPC 2 EA2 Temp Sensor	75 degrees C / 167 degrees F
FPC 2 EA2_XR0 Temp Sensor	81 degrees C / 177 degrees F
FPC 2 EA2_XR1 Temp Sensor	81 degrees C / 177 degrees F
FPC 2 EA3 Temp Sensor	67 degrees C / 152 degrees F
FPC 2 EA3_XR0 Temp Sensor	69 degrees C / 156 degrees F
FPC 2 EA3_XR1 Temp Sensor	69 degrees C / 156 degrees F
FPC 2 EA4 Temp Sensor	76 degrees C / 168 degrees F
FPC 2 EA4_XR0 Temp Sensor	77 degrees C / 170 degrees F
FPC 2 EA4_XR1 Temp Sensor	76 degrees C / 168 degrees F
FPC 2 EA5 Temp Sensor	60 degrees C / 140 degrees F
FPC 2 EA5_XR0 Temp Sensor	65 degrees C / 149 degrees F
FPC 2 EA5_XR1 Temp Sensor	65 degrees C / 149 degrees F
FPC 2 EA0_HMC0 Logic die	84 degrees C / 183 degrees F
FPC 2 EA0_HMC0 DRAM botm	81 degrees C / 177 degrees F
FPC 2 EA0_HMC1 Logic die	86 degrees C / 186 degrees F
FPC 2 EA0_HMC1 DRAM botm	83 degrees C / 181 degrees F
FPC 2 EA0_HMC2 Logic die	83 degrees C / 181 degrees F
FPC 2 EA0_HMC2 DRAM botm	80 degrees C / 176 degrees F
FPC 2 EA1_HMC0 Logic die	76 degrees C / 168 degrees F
FPC 2 EA1_HMC0 DRAM botm	73 degrees C / 163 degrees F
FPC 2 EA1_HMC1 Logic die	77 degrees C / 170 degrees F
FPC 2 EA1_HMC1 DRAM botm	74 degrees C / 165 degrees F
FPC 2 EA1_HMC2 Logic die	76 degrees C / 168 degrees F
FPC 2 EA1_HMC2 DRAM botm	73 degrees C / 163 degrees F
FPC 2 EA2_HMC0 Logic die	87 degrees C / 188 degrees F



FPC 2 EA2_HMC0 DRAM botm	84 degrees C / 183 degrees F
FPC 2 EA2_HMC1 Logic die	89 degrees C / 192 degrees F
FPC 2 EA2_HMC1 DRAM botm	86 degrees C / 186 degrees F
FPC 2 EA2_HMC2 Logic die	88 degrees C / 190 degrees F
FPC 2 EA2_HMC2 DRAM botm	85 degrees C / 185 degrees F
FPC 2 EA3_HMC0 Logic die	80 degrees C / 176 degrees F
FPC 2 EA3_HMC0 DRAM botm	77 degrees C / 170 degrees F
FPC 2 EA3_HMC1 Logic die	81 degrees C / 177 degrees F
FPC 2 EA3_HMC1 DRAM botm	78 degrees C / 172 degrees F
FPC 2 EA3_HMC2 Logic die	81 degrees C / 177 degrees F
FPC 2 EA3_HMC2 DRAM botm	78 degrees C / 172 degrees F
FPC 2 EA4_HMC0 Logic die	88 degrees C / 190 degrees F
FPC 2 EA4_HMC0 DRAM botm	85 degrees C / 185 degrees F
FPC 2 EA4_HMC1 Logic die	90 degrees C / 194 degrees F
FPC 2 EA4_HMC1 DRAM botm	87 degrees C / 188 degrees F
FPC 2 EA4_HMC2 Logic die	81 degrees C / 177 degrees F
FPC 2 EA4_HMC2 DRAM botm	78 degrees C / 172 degrees F
FPC 2 EA5_HMC0 Logic die	73 degrees C / 163 degrees F
FPC 2 EA5_HMC0 DRAM botm	70 degrees C / 158 degrees F
FPC 2 EA5_HMC1 Logic die	69 degrees C / 156 degrees F
FPC 2 EA5_HMC1 DRAM botm	66 degrees C / 150 degrees F
FPC 2 EA5_HMC2 Logic die	73 degrees C / 163 degrees F
FPC 2 EA5_HMC2 DRAM botm	70 degrees C / 158 degrees F
Power	
12V SS 1	12285 mV 9408 mA 115582 mW
12V SS 2	12338 mV 20881 mA 257637 mW
12V SS 3	12351 mV 10317 mA 127430 mW
12V SS 4	12285 mV 21054 mA 258660 mW
12V SS 5	12153 mV 13954 mA 169591 mW
VDD 1.0V_A	1000 mV 91000 mA 91000 mW
VDD 1.0V_B	0 mV 0 mA 0 mW
VDD 3.3V	3298 mV 9125 mA 30101 mW
VDD 0.9V	897 mV 3337 mA 2993 mW
ETH SW 1V	0 mV 0 mA 0 mW
VDD 1.8V	1809 mV 1127 mA 2040 mW
PVCC	835 mV 0 mA 0 mW
PVNN	1000 mV 0 mA 0 mW
V1P0	1003 mV 0 mA 0 mW
V1P1	1070 mV 0 mA 0 mW
V1P3	1348 mV 0 mA 0 mW
VDDQ	1493 mV 0 mA 0 mW
V1P8	1806 mV 0 mA 0 mW
VDD3V3	3303 mV 0 mA 0 mW
V5V0_BIAS	5000 mV 0 mA 0 mW
VDD12V0	12116 mV 0 mA 0 mW
EA0 Core 0.9V	900 mV 38875 mA 35002 mW
EA0 AVDD 1.0V	999 mV 31875 mA 31843 mW
EA0 HMC Core 0.9V	894 mV 9034 mA 8081 mW
EA0 1.2V	1197 mV 15430 mA 18471 mW
EA01_HMC_VDDM 1.2V	1200 mV -267 mA -321 mW
EA0_XR 0.906V	908 mV 15430 mA 14012 mW
EA1 Core 0.9V	900 mV 38875 mA 35002 mW
EA1 AVDD 1.0V	1000 mV 28250 mA 28250 mW
EA1 HMC Core 0.9V	899 mV 8802 mA 7920 mW
EA1 1.2V	1197 mV 15081 mA 18054 mW
EA0_PLL_1V0	1003 mV 0 mA 0 mW
EA0_1V04	1048 mV 0 mA 0 mW
EA0_2V5	2425 mV 0 mA 0 mW
EA0_1V5	1483 mV 0 mA 0 mW
EA1_PLL_1V0	1019 mV 0 mA 0 mW

EA1_1V04	1019 mV	0 mA	0 mW
EA1_2V5	2490 mV	0 mA	0 mW
EA1_1V5	1480 mV	0 mA	0 mW
EA1_XR 0.906V	908 mV	14965 mA	13590 mW
EA2 Core 0.9V	900 mV	44000 mA	39617 mW
EA2 AVDD 1.0V	1000 mV	28625 mA	28625 mW
EA2 HMC Core 0.9V	891 mV	10546 mA	9404 mW
EA2 1.2V	1200 mV	15313 mA	18387 mW
EA23_HMC_VDDM 1.2V	1193 mV	-267 mA	-319 mW
EA2_XR 0.906V	908 mV	15197 mA	13801 mW
EA3 Core 0.9V	900 mV	39750 mA	35790 mW
EA3 AVDD 1.0V	1000 mV	27750 mA	27750 mW
EA3 HMC Core 0.9V	897 mV	9267 mA	8314 mW
EA3 1.2V	1197 mV	15430 mA	18471 mW
EA2_PLL_1V0	1009 mV	0 mA	0 mW
EA2_1V04	1041 mV	0 mA	0 mW
EA2_2V5	2496 mV	0 mA	0 mW
EA2_1V5	1493 mV	0 mA	0 mW
EA3_PLL_1V0	1003 mV	0 mA	0 mW
EA3_1V04	1041 mV	0 mA	0 mW
EA3_2V5	2490 mV	0 mA	0 mW
EA3_1V5	1500 mV	0 mA	0 mW
EA3_XR 0.906V	908 mV	15081 mA	13695 mW
EA4 Core 0.9V	899 mV	45750 mA	41148 mW
EA4 AVDD 1.0V	1000 mV	32250 mA	32250 mW
EA4 HMC Core 0.9V	897 mV	10779 mA	9670 mW
EA4 1.2V	1193 mV	16011 mA	19110 mW
EA45_HMC_VDDM 1.2V	1200 mV	-267 mA	-321 mW
EA4_XR 0.906V	905 mV	15779 mA	14286 mW
EA5 Core 0.9V	900 mV	38375 mA	34552 mW
EA5 AVDD 1.0V	1000 mV	27750 mA	27777 mW
EA5 HMC Core 0.9V	899 mV	8453 mA	7606 mW
EA5 1.2V	1200 mV	14732 mA	17689 mW
EA4_PLL_1V0	1012 mV	0 mA	0 mW
EA4_1V04	1029 mV	0 mA	0 mW
EA4_2V5	2496 mV	0 mA	0 mW
EA4_1V5	1490 mV	0 mA	0 mW
EA5_PLL_1V0	1003 mV	0 mA	0 mW
EA5_1V04	1032 mV	0 mA	0 mW
EA5_2V5	2503 mV	0 mA	0 mW
EA5_1V5	1480 mV	0 mA	0 mW
VDD2V5	2461 mV	0 mA	0 mW
VDD1V5	1490 mV	0 mA	0 mW
VDD1V2	1212 mV	0 mA	0 mW
EA5_XR 0.906V	910 mV	13686 mA	12466 mW

FPC 3 status:

State	Online
FPC 3 Intake-A Temp Sensor	30 degrees C / 86 degrees F
FPC 3 Exhaust-A Temp Sensor	48 degrees C / 118 degrees F
FPC 3 Exhaust-B Temp Sensor	45 degrees C / 113 degrees F
FPC 3 EA0 Temp Sensor	60 degrees C / 140 degrees F
FPC 3 EA0_XR0 Temp Sensor	65 degrees C / 149 degrees F
FPC 3 EA0_XR1 Temp Sensor	67 degrees C / 152 degrees F
FPC 3 EA1 Temp Sensor	54 degrees C / 129 degrees F
FPC 3 EA1_XR0 Temp Sensor	60 degrees C / 140 degrees F
FPC 3 EA1_XR1 Temp Sensor	58 degrees C / 136 degrees F
FPC 3 EA2 Temp Sensor	62 degrees C / 143 degrees F
FPC 3 EA2_XR0 Temp Sensor	67 degrees C / 152 degrees F
FPC 3 EA2_XR1 Temp Sensor	67 degrees C / 152 degrees F
FPC 3 EA3 Temp Sensor	55 degrees C / 131 degrees F

FPC 3 EA3_XR0 Temp Sensor	57 degrees C / 134 degrees F
FPC 3 EA3_XR1 Temp Sensor	57 degrees C / 134 degrees F
FPC 3 EA4 Temp Sensor	69 degrees C / 156 degrees F
FPC 3 EA4_XR0 Temp Sensor	71 degrees C / 159 degrees F
FPC 3 EA4_XR1 Temp Sensor	70 degrees C / 158 degrees F
FPC 3 EA5 Temp Sensor	55 degrees C / 131 degrees F
FPC 3 EA5_XR0 Temp Sensor	58 degrees C / 136 degrees F
FPC 3 EA5_XR1 Temp Sensor	59 degrees C / 138 degrees F
FPC 3 EA0_HMC0 Logic die	69 degrees C / 156 degrees F
FPC 3 EA0_HMC0 DRAM botm	66 degrees C / 150 degrees F
FPC 3 EA0_HMC1 Logic die	70 degrees C / 158 degrees F
FPC 3 EA0_HMC1 DRAM botm	67 degrees C / 152 degrees F
FPC 3 EA0_HMC2 Logic die	70 degrees C / 158 degrees F
FPC 3 EA0_HMC2 DRAM botm	67 degrees C / 152 degrees F
FPC 3 EA1_HMC0 Logic die	68 degrees C / 154 degrees F
FPC 3 EA1_HMC0 DRAM botm	65 degrees C / 149 degrees F
FPC 3 EA1_HMC1 Logic die	65 degrees C / 149 degrees F
FPC 3 EA1_HMC1 DRAM botm	62 degrees C / 143 degrees F
FPC 3 EA1_HMC2 Logic die	64 degrees C / 147 degrees F
FPC 3 EA1_HMC2 DRAM botm	61 degrees C / 141 degrees F
FPC 3 EA2_HMC0 Logic die	74 degrees C / 165 degrees F
FPC 3 EA2_HMC0 DRAM botm	71 degrees C / 159 degrees F
FPC 3 EA2_HMC1 Logic die	77 degrees C / 170 degrees F
FPC 3 EA2_HMC1 DRAM botm	74 degrees C / 165 degrees F
FPC 3 EA2_HMC2 Logic die	74 degrees C / 165 degrees F
FPC 3 EA2_HMC2 DRAM botm	71 degrees C / 159 degrees F
FPC 3 EA3_HMC0 Logic die	70 degrees C / 158 degrees F
FPC 3 EA3_HMC0 DRAM botm	67 degrees C / 152 degrees F
FPC 3 EA3_HMC1 Logic die	68 degrees C / 154 degrees F
FPC 3 EA3_HMC1 DRAM botm	65 degrees C / 149 degrees F
FPC 3 EA3_HMC2 Logic die	68 degrees C / 154 degrees F
FPC 3 EA3_HMC2 DRAM botm	65 degrees C / 149 degrees F
FPC 3 EA4_HMC0 Logic die	82 degrees C / 179 degrees F
FPC 3 EA4_HMC0 DRAM botm	79 degrees C / 174 degrees F
FPC 3 EA4_HMC1 Logic die	80 degrees C / 176 degrees F
FPC 3 EA4_HMC1 DRAM botm	77 degrees C / 170 degrees F
FPC 3 EA4_HMC2 Logic die	81 degrees C / 177 degrees F
FPC 3 EA4_HMC2 DRAM botm	78 degrees C / 172 degrees F
FPC 3 EA5_HMC0 Logic die	69 degrees C / 156 degrees F
FPC 3 EA5_HMC0 DRAM botm	66 degrees C / 150 degrees F
FPC 3 EA5_HMC1 Logic die	70 degrees C / 158 degrees F
FPC 3 EA5_HMC1 DRAM botm	67 degrees C / 152 degrees F
FPC 3 EA5_HMC2 Logic die	69 degrees C / 156 degrees F
FPC 3 EA5_HMC2 DRAM botm	66 degrees C / 150 degrees F
Power	
12V SS 1	12259 mV 9538 mA 116927 mW
12V SS 2	12259 mV 20491 mA 251202 mW
12V SS 3	12298 mV 9711 mA 119433 mW
12V SS 4	12219 mV 20491 mA 250391 mW
12V SS 5	12206 mV 10447 mA 127520 mW
VDD 1.0V_A	1000 mV 42250 mA 42291 mW
VDD 1.0V_B	996 mV 8918 mA 8890 mW
VDD 3.3V	3301 mV 10375 mA 34255 mW
VDD 0.9V	897 mV 3569 mA 3202 mW
ETH SW 1V	983 mV 4267 mA 4195 mW
VDD 1.8V	1812 mV 1825 mA 3309 mW
PVCC	974 mV 0 mA 0 mW
PVNN	1003 mV 0 mA 0 mW
V1P0	1003 mV 0 mA 0 mW
V1P1	1070 mV 0 mA 0 mW

V1P3	1351 mV	0 mA	0 mW
VDDQ	1496 mV	0 mA	0 mW
V1P8	1809 mV	0 mA	0 mW
VDD3V3	3309 mV	0 mA	0 mW
V5V0_BIAS	4987 mV	0 mA	0 mW
VDD12V0	12212 mV	0 mA	0 mW
EA0 Core 0.9V	900 mV	38125 mA	34327 mW
EA0 AVDD 1.0V	999 mV	31125 mA	31094 mW
EA0 HMC Core 0.9V	897 mV	9500 mA	8522 mW
EA0 1.2V	1193 mV	15430 mA	18416 mW
EA01_HMC_VDDM 1.2V	1193 mV	313 mA	374 mW
EA0_XR 0.906V	913 mV	14965 mA	13671 mW
EA1 Core 0.9V	900 mV	39750 mA	35790 mW
EA1 AVDD 1.0V	1000 mV	26000 mA	26000 mW
EA1 HMC Core 0.9V	897 mV	8918 mA	8001 mW
EA1 1.2V	1200 mV	15779 mA	18946 mW
EA0_PLL_1V0	1003 mV	0 mA	0 mW
EA0_1V04	1019 mV	0 mA	0 mW
EA0_2V5	2448 mV	0 mA	0 mW
EA0_1V5	1470 mV	0 mA	0 mW
EA1_PLL_1V0	1016 mV	0 mA	0 mW
EA1_1V04	1035 mV	0 mA	0 mW
EA1_2V5	2506 mV	0 mA	0 mW
EA1_1V5	1483 mV	0 mA	0 mW
EA1_XR 0.906V	908 mV	13918 mA	12639 mW
EA2 Core 0.9V	900 mV	38625 mA	34777 mW
EA2 AVDD 1.0V	1000 mV	26375 mA	26400 mW
EA2 HMC Core 0.9V	897 mV	9383 mA	8418 mW
EA2 1.2V	1200 mV	15779 mA	18946 mW
EA23_HMC_VDDM 1.2V	1193 mV	81 mA	97 mW
EA2_XR 0.906V	908 mV	13918 mA	12639 mW
EA3 Core 0.9V	899 mV	40250 mA	36201 mW
EA3 AVDD 1.0V	1000 mV	26750 mA	26776 mW
EA3 HMC Core 0.9V	894 mV	9267 mA	8289 mW
EA3 1.2V	1197 mV	16127 mA	19306 mW
EA2_PLL_1V0	993 mV	0 mA	0 mW
EA2_1V04	1045 mV	0 mA	0 mW
EA2_2V5	2474 mV	0 mA	0 mW
EA2_1V5	1490 mV	0 mA	0 mW
EA3_PLL_1V0	980 mV	0 mA	0 mW
EA3_1V04	1032 mV	0 mA	0 mW
EA3_2V5	2506 mV	0 mA	0 mW
EA3_1V5	1474 mV	0 mA	0 mW
EA3_XR 0.906V	910 mV	14732 mA	13419 mW
EA4 Core 0.9V	900 mV	42500 mA	38266 mW
EA4 AVDD 1.0V	1000 mV	32250 mA	32281 mW
EA4 HMC Core 0.9V	899 mV	10081 mA	9071 mW
EA4 1.2V	1193 mV	16360 mA	19526 mW
EA45_HMC_VDDM 1.2V	1193 mV	662 mA	791 mW
EA4_XR 0.906V	908 mV	15430 mA	14012 mW
EA5 Core 0.9V	899 mV	37000 mA	33278 mW
EA5 AVDD 1.0V	1000 mV	26125 mA	26150 mW
EA5 HMC Core 0.9V	897 mV	9267 mA	8314 mW
EA5 1.2V	1197 mV	15662 mA	18750 mW
EA4_PLL_1V0	1000 mV	0 mA	0 mW
EA4_1V04	1029 mV	0 mA	0 mW
EA4_2V5	2487 mV	0 mA	0 mW
EA4_1V5	1496 mV	0 mA	0 mW
EA5_PLL_1V0	1009 mV	0 mA	0 mW
EA5_1V04	1032 mV	0 mA	0 mW

EA5_2V5	2503 mV	0 mA	0 mW
EA5_1V5	1496 mV	0 mA	0 mW
VDD2V5	2483 mV	0 mA	0 mW
VDD1V5	1470 mV	0 mA	0 mW
VDD1V2	1203 mV	0 mA	0 mW
EA5_XR 0.906V	908 mV	14500 mA	13167 mW

### show chassis environment fpc (T320, T640, and T1600 Routers)

```
user@host> show chassis environment fpc
```

#### FPC 0 status:

State	Online
Temperature Top	42 degrees C / 107 degrees F
Temperature Bottom	36 degrees C / 96 degrees F
Temperature MMB1	39 degrees C / 102 degrees F
Power:	
1.8 V	1959 mV
2.5 V	2495 mV
3.3 V	3344 mV
5.0 V	5047 mV
1.8 V bias	1787 mV
3.3 V bias	3291 mV
5.0 V bias	4998 mV
8.0 V bias	7343 mV
BUS Revision	40

#### FPC 1 status:

State	Online
Temperature Top	42 degrees C / 107 degrees F
Temperature Bottom	39 degrees C / 102 degrees F
Temperature MMB1	40 degrees C / 104 degrees F
Power:	
1.8 V	1956 mV
2.5 V	2498 mV
3.3 V	3340 mV
5.0 V	5023 mV
1.8 V bias	1782 mV
3.3 V bias	3277 mV
5.0 V bias	4989 mV
8.0 V bias	7289 mV
BUS Revision	40

#### FPC 2 status:

State	Online
Temperature Top	43 degrees C / 109 degrees F
Temperature Bottom	39 degrees C / 102 degrees F
Temperature MMB1	41 degrees C / 105 degrees F
Power:	
1.8 V	1963 mV
2.5 V	2503 mV
3.3 V	3340 mV
5.0 V	5042 mV
1.8 V bias	1797 mV
3.3 V bias	3311 mV
5.0 V bias	5013 mV
8.0 V bias	7221 mV
BUS Revision	40

## show chassis environment fpc (T4000 Router)

```
user@host> show chassis environment fpc
```

```
FPC 0 status:
```

State	Online
Fan Intake	34 degrees C / 93 degrees F
Fan Exhaust	48 degrees C / 118 degrees F
PMB	47 degrees C / 116 degrees F
LMB0	50 degrees C / 122 degrees F
LMB1	41 degrees C / 105 degrees F
LMB2	35 degrees C / 95 degrees F
PFE1 LU2	46 degrees C / 114 degrees F
PFE1 LU0	41 degrees C / 105 degrees F
PFE0 LU0	57 degrees C / 134 degrees F
XF1	47 degrees C / 116 degrees F
XF0	52 degrees C / 125 degrees F
XM1	41 degrees C / 105 degrees F
XM0	50 degrees C / 122 degrees F
PFE0 LU1	56 degrees C / 132 degrees F
PFE0 LU2	45 degrees C / 113 degrees F
PFE1 LU1	37 degrees C / 98 degrees F

```
Power 1
```

1.0 V	991 mV
1.2 V bias	1195 mV
1.8 V	1788 mV
2.5 V	2483 mV
3.3 V	3289 mV
3.3 V bias	3299 mV
12.0 V A	10608 mV
12.0 V B	10637 mV

```
Power 2
```

0.9 V	881 mV
0.9 V PFE0	916 mV
0.9 V PFE1	903 mV
1.0 V PFE0	1012 mV
1.0 V PFE1	1002 mV
1.1 V	1095 mV
1.5 V_0	1494 mV
1.5 V_1	1479 mV

```
Power 3
```

1.0 V PFE0	1000 mV
1.0 V PFE1	1002 mV
1.0 V PFE0 *	995 mV
1.0 V PFE1 *	995 mV
1.8 V PFE 0	1788 mV
1.8 V PFE 1	1789 mV
2.5 V	2482 mV
12.0 V	11614 mV

```
Power 4
```

1.0 V PFE0 LU0	1003 mV
1.0 V PFE1 LU0	1003 mV
1.0 V PFE1 LU2	1004 mV
1.0 V PFE0 LU0 *	995 mV
1.0 V PFE1 LU0 *	998 mV
1.0 V PFE1 LU2 *	996 mV
12.0 V	11643 mV
12.0 V C	11711 mV

```
Power (Base/PMB/MMB)
```

LMB0 VDD2V5	2488 mV
LMB0 VDD1V8	1788 mV

```

LMB0 VDD1V5          1496 mV
LMB0 PFE0 LU0 AVDD1V0 1002 mV
LMB0 PFE0 LU0 VDD1V0  1000 mV
LMB0 VDD12V0         10752 mV
LMB1 VDD2V5          2472 mV
LMB1 VDD1V8          1792 mV
LMB1 VDD1V5          1480 mV
LMB1 PFE0 LU2 AVDD1V0  994 mV
LMB1 PFE0 LU2 VDD1V0  1002 mV
LMB1 VDD12V0         10800 mV
LMB2 VDD2V5          2472 mV
LMB2 VDD1V8          1792 mV
LMB2 VDD1V5          1486 mV
LMB2 PFE1 LU1 AVDD1V0  996 mV
LMB2 PFE1 LU1 VDD1V0  998 mV
LMB2 VDD12V0         10704 mV
PMB 1.05v            1049 mV
PMB 1.5v             1500 mV
PMB 2.5v             2500 mV
PMB 3.3v             3299 mV
Bus Revision          113
FPC 3 status:
State                 Online
Fan Intake            37 degrees C / 98 degrees F
Fan Exhaust           51 degrees C / 123 degrees F
PMB                   43 degrees C / 109 degrees F
LMB0                   57 degrees C / 134 degrees F
LMB1                   54 degrees C / 129 degrees F
LMB2                   38 degrees C / 100 degrees F
PFE1 LU2              63 degrees C / 145 degrees F
PFE1 LU0              45 degrees C / 113 degrees F
PFE0 LU0              69 degrees C / 156 degrees F
XF1                   62 degrees C / 143 degrees F
XF0                   63 degrees C / 145 degrees F
XM1                   43 degrees C / 109 degrees F
XM0                   67 degrees C / 152 degrees F
PFE0 LU1              63 degrees C / 145 degrees F
PFE0 LU2              66 degrees C / 150 degrees F
PFE1 LU1              41 degrees C / 105 degrees F
Power 1
  1.0 V               1002 mV
  1.2 V bias          1201 mV
  1.8 V               1785 mV
  2.5 V               2485 mV
  3.3 V               3288 mV
  3.3 V bias          3285 mV
  12.0 V A            10412 mV
  12.0 V B            10515 mV
Power 2
  0.9 V               882 mV
  0.9 V PFE0          920 mV
  0.9 V PFE1          905 mV
  1.0 V PFE0          1015 mV
  1.0 V PFE1          1001 mV
  1.1 V               1094 mV
  1.5 V_0             1495 mV
  1.5 V_1             1478 mV
Power 3
  0.92 V PFE1         998 mV
  1.0 V PFE0          997 mV

```

1.0 V PFE0 *	992 mV
1.0 V PFE1 *	991 mV
1.8 V PFE 0	1780 mV
1.8 V PFE 1	1797 mV
2.5 V	2492 mV
12.0 V	11604 mV
Power 4	
1.0 V PFE0 LU0	1003 mV
1.0 V PFE1 LU0	1004 mV
1.0 V PFE1 LU2	1003 mV
1.0 V PFE0 LU0 *	1000 mV
1.0 V PFE1 LU0 *	1001 mV
1.0 V PFE1 LU2 *	1003 mV
12.0 V	11653 mV
12.0 V C	11672 mV
Power (Base/PMB/MMB)	
LMB0 VDD2V5	2512 mV
LMB0 VDD1V8	1790 mV
LMB0 VDD1V5	1500 mV
LMB0 PFE0 LU0 AVDD1V0	1004 mV
LMB0 PFE0 LU0 VDD1V0	1002 mV
LMB0 VDD12V0	10608 mV
LMB1 VDD2V5	2472 mV
LMB1 VDD1V8	1788 mV
LMB1 VDD1V5	1480 mV
LMB1 PFE0 LU2 AVDD1V0	1000 mV
LMB1 PFE0 LU2 VDD1V0	1004 mV
LMB1 VDD12V0	10672 mV
LMB2 VDD2V5	2488 mV
LMB2 VDD1V8	1798 mV
LMB2 VDD1V5	1494 mV
LMB2 PFE1 LU1 AVDD1V0	1000 mV
LMB2 PFE1 LU1 VDD1V0	1004 mV
LMB2 VDD12V0	10528 mV
PMB 1.05v	1050 mV
PMB 1.5v	1500 mV
PMB 2.5v	2499 mV
PMB 3.3v	3299 mV
Bus Revision	113
FPC 5 status:	
State	Online
Temperature Top	39 degrees C / 102 degrees F
Temperature Bottom	38 degrees C / 100 degrees F
Power	
1.8 V	1804 mV
1.8 V bias	1802 mV
3.3 V	3294 mV
3.3 V bias	3277 mV
5.0 V bias	5008 mV
5.0 V TOP	5067 mV
8.0 V bias	6642 mV
Power (Base/PMB/MMB)	
1.2 V	1202 mV
1.5 V	1504 mV
5.0 V BOT	5079 mV
12.0 V TOP Base	11848 mV
12.0 V BOT Base	11780 mV
1.1 V PMB	1111 mV
1.2 V PMB	1189 mV
1.5 V PMB	1494 mV



```

1.8 V PMB                1819 mV
2.5 V PMB                2503 mV
3.3 V PMB                3294 mV
5.0 V PMB                5035 mV
12.0 V PMB              11788 mV
0.75 MMB TOP            766 mV
1.5 V MMB TOP           1484 mV
1.8 V MMB TOP           1772 mV
2.5 V MMB TOP           2485 mV
1.2 V MMB TOP           1137 mV
5.0 V MMB TOP           4946 mV
12.0 V MMB TOP          11772 mV
3.3 V MMB TOP           3289 mV
0.75 MMB BOT            759 mV
1.5 V MMB BOT           1482 mV
1.8 V MMB BOT           1792 mV
2.5 V MMB BOT           2490 mV
1.2 V MMB BOT           1145 mV
5.0 V MMB BOT           4922 mV
12.0 V MMB BOT          11625 mV
3.3 V MMB BOT           3282 mV
APS 00                  2495 mV
APS 01                  3308 mV
APS 02                  3301 mV
5.0 V PIC 0             4967 mV
APS 10                  2512 mV
APS 11                  3316 mV
APS 12                  3304 mV
5.0 V PIC 1             5081 mV
Bus Revision             49
FPC 6 status:
State                    Online
Fan Intake               34 degrees C / 93 degrees F
Fan Exhaust              49 degrees C / 120 degrees F
PMB                      40 degrees C / 104 degrees F
LMB0                     60 degrees C / 140 degrees F
LMB1                     58 degrees C / 136 degrees F
LMB2                     40 degrees C / 104 degrees F
PFE1 LU2                 69 degrees C / 156 degrees F
PFE1 LU0                 45 degrees C / 113 degrees F
PFE0 LU0                 71 degrees C / 159 degrees F
XF1                      58 degrees C / 136 degrees F
XF0                      65 degrees C / 149 degrees F
XM1                      40 degrees C / 104 degrees F
XM0                      66 degrees C / 150 degrees F
PFE0 LU1                 69 degrees C / 156 degrees F
PFE0 LU2                 68 degrees C / 154 degrees F
PFE1 LU1                 42 degrees C / 107 degrees F
Power 1
1.0 V                    998 mV
1.2 V bias               1191 mV
1.8 V                    1781 mV
2.5 V                    2487 mV
3.3 V                    3302 mV
3.3 V bias               3300 mV
12.0 V A                 10388 mV
12.0 V B                 10388 mV
Power 2
0.9 V                    902 mV
0.9 V PFE0               921 mV

```

0.9 V PFE1	907 mV
1.0 V PFE0	996 mV
1.0 V PFE1	974 mV
1.1 V	1095 mV
1.5 V_0	1495 mV
1.5 V_1	1478 mV
Power 3	
1.0 V PFE0	997 mV
1.0 V PFE1	998 mV
1.0 V PFE0 *	993 mV
1.0 V PFE1 *	991 mV
1.8 V PFE 0	1796 mV
1.8 V PFE 1	1789 mV
2.5 V	2465 mV
12.0 V	11609 mV
Power 4	
1.0 V PFE0 LU0	1003 mV
1.0 V PFE1 LU0	1006 mV
1.0 V PFE1 LU2	1002 mV
1.0 V PFE0 LU0 *	1000 mV
1.0 V PFE1 LU0 *	998 mV
1.0 V PFE1 LU2 *	998 mV
12.0 V	11638 mV
12.0 V C	11702 mV
Power (Base/PMB/MMB)	
LMB0 VDD2V5	2484 mV
LMB0 VDD1V8	1780 mV
LMB0 VDD1V5	1496 mV
LMB0 PFE0 LU0 AVDD1V0	998 mV
LMB0 PFE0 LU0 VDD1V0	1004 mV
LMB0 VDD12V0	10528 mV
LMB1 VDD2V5	2472 mV
LMB1 VDD1V8	1776 mV
LMB1 VDD1V5	1474 mV
LMB1 PFE0 LU2 AVDD1V0	994 mV
LMB1 PFE0 LU2 VDD1V0	1004 mV
LMB1 VDD12V0	10544 mV
LMB2 VDD2V5	2476 mV
LMB2 VDD1V8	1790 mV
LMB2 VDD1V5	1492 mV
LMB2 PFE1 LU1 AVDD1V0	996 mV
LMB2 PFE1 LU1 VDD1V0	1010 mV
LMB2 VDD12V0	10528 mV
PMB 1.05v	1050 mV
PMB 1.5v	1499 mV
PMB 2.5v	2500 mV
PMB 3.3v	3300 mV
Bus Revision	80

### show chassis environment fpc lcc (TX Matrix Router)

```
user@host> show chassis environment fpc lcc 0
```

```
lcc0-re0:
```

```
-----
FPC 1 status:
```

State	Online
Temperature Top	30 degrees C / 86 degrees F
Temperature Bottom	25 degrees C / 77 degrees F
Temperature MMB0	Absent

```

Temperature MMB1          27 degrees C / 80 degrees F
Power:
  1.8 V                   1813 mV
  2.5 V                   2504 mV
  3.3 V                   3338 mV
  5.0 V                   5037 mV
  1.8 V bias              1797 mV
  3.3 V bias              3301 mV
  5.0 V bias              5013 mV
  8.0 V bias              7345 mV
BUS Revision              40
FPC 2 status:
State                     Online
Temperature Top            37 degrees C / 98 degrees F
Temperature Bottom         26 degrees C / 78 degrees F
Temperature MMB0           32 degrees C / 89 degrees F
Temperature MMB1           27 degrees C / 80 degrees F
Power:
  1.8 V                   1791 mV
  2.5 V                   2517 mV
  3.3 V                   3308 mV
  5.0 V                   5052 mV
  1.8 V bias              1797 mV
  3.3 V bias              3289 mV
  5.0 V bias              4991 mV
  8.0 V bias              7477 mV
BUS Revision              40

```

#### show chassis environment fpc lcc (TX Matrix Plus Router)

```
user@host> show chassis environment fpc lcc 0
```

```

lcc0-re0:
-----
FPC 1 status:
State                     Online
Temperature Top            46 degrees C / 114 degrees F
Temperature Bottom         47 degrees C / 116 degrees F
Power
  1.8 V                   1788 mV
  1.8 V bias              1787 mV
  3.3 V                   3321 mV
  3.3 V bias              3306 mV
  5.0 V bias              5018 mV
  5.0 V TOP               5037 mV
  8.0 V bias              7223 mV
Power (Base/PMB/MMB)
  1.2 V                   1205 mV
  1.5 V                   1503 mV
  5.0 V BOT               5084 mV
  12.0 V TOP Base         11775 mV
  12.0 V BOT Base         11794 mV
  1.1 V PMB               1108 mV
  1.2 V PMB               1196 mV
  1.5 V PMB               1499 mV
  1.8 V PMB               1811 mV
  2.5 V PMB               2515 mV
  3.3 V PMB               3318 mV
  5.0 V PMB               5030 mV
  12.0 V PMB              11832 mV

```

0.75 V MMB TOP	752 mV
1.5 V MMB TOP	1489 mV
1.8 V MMB TOP	1782 mV
2.5 V MMB TOP	2498 mV
1.2 V MMB TOP	1155 mV
5.0 V MMB TOP	4902 mV
12.0 V MMB TOP	11721 mV
3.3 V MMB TOP	3316 mV
0.75 V MMB BOT	754 mV
1.5 V MMB BOT	1482 mV
1.8 V MMB BOT	1758 mV
2.5 V MMB BOT	2488 mV
1.2 V MMB BOT	1157 mV
5.0 V MMB BOT	4962 mV
12.0 V MMB BOT	11691 mV
3.3 V MMB BOT	3308 mV
APS 00	1484 mV
APS 01	2503 mV
APS 02	3313 mV
5.0 V PIC 0	5025 mV
APS 10	1501 mV
APS 11	2466 mV
APS 12	3311 mV
5.0 V PIC 1	5081 mV
Bus Revision	49

#### show chassis environment fpc (QFX Series and OCX Series)

```
user@switch> show chassis environment fpc 0
```

```
FPC 0 status:
State          Online
Temperature    42 degrees C / 107 degrees F
```

#### show chassis environment fpc interconnect-device (QFabric Systems)

```
user@switch> show chassis environment fpc interconnect-device interconnect1 0
```

```
FC 0 FPC 0 status:
State          Online
Left Intake Temperature  24 degrees C / 75 degrees F
Right Intake Temperature 24 degrees C / 75 degrees F
Left Exhaust Temperature 27 degrees C / 80 degrees F
Right Exhaust Temperature 27 degrees C / 80 degrees F
Power
  BIAS 3V3          3330 mV
  VDD 3V3           3300 mV
  VDD 2V5           2502 mV
  VDD 1V5           1496 mV
  VDD 1V2           1194 mV
  VDD 1V0           1000 mV
  SW0 VDD 1V0       1020 mV
  SW0 CVDD 1V025    1032 mV
  SW1 VDD 1V0       1022 mV
  SW1 CVDD 1V025    1030 mV
  VDD 12V0 DIV3_33  3414 mV
```

**show chassis environment fpc 5(PTX3000 Packet Transport Router)**

```
user@host> show chassis environment fpc 5
```

```
FPC 5 status:
```

State	Online
Intake Temperature	31 degrees C / 87 degrees F
Exhaust Temperature	41 degrees C / 105 degrees F
Power	
FPC 12.0v	12221 mV
FPC VCC 0.5-1.3v	1640 mV
FPC VNN 0.5-1.3v	1640 mV
FPC 1.0v	1640 mV
FPC 1.1v	1640 mV
FPC 1.35v	1640 mV
FPC VDDQ 1.5v	1640 mV
FPC 1.8v	1640 mV
FPC 3.3v	3280 mV
FPC 5.0v bias	5143 mV
FPC 5.0v usb	5143 mV
FPC VCC 12.0v	12289 mV
FPC Vref 3.3v	3280 mV
MAIN 12.0v-i	2265 mA

**show chassis environment fpc 0 (PTX5000 Packet Transport Router)**

```
user@host> show chassis environment fpc 0
```

```
FPC 0 status:
```

State	Online
PMB Temperature	35 degrees C / 95 degrees F
Intake Temperature	33 degrees C / 91 degrees F
Exhaust A Temperature	51 degrees C / 123 degrees F
Exhaust B Temperature	43 degrees C / 109 degrees F
TL0 Temperature	48 degrees C / 118 degrees F
TQ0 Temperature	53 degrees C / 127 degrees F
TL1 Temperature	56 degrees C / 132 degrees F
TQ1 Temperature	58 degrees C / 136 degrees F
TL2 Temperature	55 degrees C / 131 degrees F
TQ2 Temperature	57 degrees C / 134 degrees F
TL3 Temperature	59 degrees C / 138 degrees F
TQ3 Temperature	59 degrees C / 138 degrees F
Power	
PMB 1.05v	1049 mV
PMB 1.5v	1500 mV
PMB 2.5v	2500 mV
PMB 3.3v	3299 mV
PFE0 1.5v	1500 mV
PFE0 1.0v	999 mV
TQ0 0.9v	900 mV
TL0 0.9v	900 mV
PFE1 1.5v	1499 mV
PFE1 1.0v	999 mV
TQ1 0.9v	899 mV
TL1 0.9v	900 mV
PFE2 1.5v	1500 mV
PFE2 1.0v	1000 mV
TQ2 0.9v	900 mV
TL2 0.9v	900 mV
PFE3 1.5v	1499 mV

PFE3	1.0v	1000 mV
TQ3	0.9v	900 mV
TL3	0.9v	900 mV
Bias	3.3v	3327 mV
FPC	3.3v	3300 mV
FPC	2.5v	2500 mV
SAM	0.9v	900 mV
A	12.0v	2014 mV
B	12.0v	2030 mV

### show chassis environment fpc 07 (PTX5000 Packet Transport Router with FPC2-PTX-PIA)

```
user@host> show chassis environment fpc 07
```

```
FPC 7 status:
State                               Online
PMB TEMPO Temperature              32 degrees C / 89 degrees F
PMB TEMP1 Temperature              28 degrees C / 82 degrees F
PMB CPU Temperature                 46 degrees C / 114 degrees F
Intake Temperature                  35 degrees C / 95 degrees F
Exhaust A Temperature              55 degrees C / 131 degrees F
Exhaust B Temperature              54 degrees C / 129 degrees F
TL5 Temperature                     59 degrees C / 138 degrees F
TQ5 Temperature                     57 degrees C / 134 degrees F
TL6 Temperature                     57 degrees C / 134 degrees F
TQ6 Temperature                     51 degrees C / 123 degrees F
TL1 Temperature                     76 degrees C / 168 degrees F
TQ1 Temperature                     58 degrees C / 136 degrees F
TL2 Temperature                     75 degrees C / 167 degrees F
TQ2 Temperature                     57 degrees C / 134 degrees F
TL4 Temperature                     52 degrees C / 125 degrees F
TQ4 Temperature                     66 degrees C / 150 degrees F
TL7 Temperature                     52 degrees C / 125 degrees F
TQ7 Temperature                     60 degrees C / 140 degrees F
TL0 Temperature                     72 degrees C / 161 degrees F
TQ0 Temperature                     73 degrees C / 163 degrees F
TL3 Temperature                     64 degrees C / 147 degrees F
TQ3 Temperature                     70 degrees C / 158 degrees F
Power
PMB 1.05v                           1049 mV
PMB 3.3v                             3299 mV
PMB 1.1v-a                           1100 mV
PMB 1.5v                             1499 mV
PMB 1.1v-b                           1100 mV
Base 3.3v                            3300 mV
FPC Base 2.5v                        2499 mV
TL1 0.9v                             897 mV
TQ1 0.9v                             897 mV
PFE1 1.0v                             999 mV
PFE1 1.5v                            1499 mV
TL2 0.9v                             897 mV
TQ2 0.9v                             897 mV
PFE2 1.0v                             999 mV
PFE2 1.5v                            1499 mV
FPC Base 1.0v                        1000 mV
FPC Base 1.2v                        1199 mV
TL5 0.9v                             898 mV
TQ5 0.9v                             898 mV
PFE5 1.0v                             1000 mV
PFE5 1.5v                            1500 mV
```

TL6	0.9v	897 mV
TQ6	0.9v	897 mV
PFE6	1.0v	1000 mV
PFE6	1.5v	1499 mV
Mezz Base	2.5v	2500 mV
TL0	0.9v	896 mV
TQ0	0.9v	896 mV
PFE0	1.0v	999 mV
PFE0	1.5v	1499 mV

### show chassis environment fpc (PTX10008 router)

```
user@host> show chassis environment fpc
```

FPC 0 status:

State	Online
FPC 0 Intake-A Temp Sensor	37 degrees C / 98 degrees F
FPC 0 Intake-B Temp Sensor	34 degrees C / 93 degrees F
FPC 0 Exhaust-A Temp Sensor	37 degrees C / 98 degrees F
FPC 0 Exhaust-B Temp Sensor	38 degrees C / 100 degrees F
FPC 0 Exhaust-C Temp Sensor	40 degrees C / 104 degrees F
FPC 0 PE0 Temp Sensor	41 degrees C / 105 degrees F
FPC 0 PE1 Temp Sensor	42 degrees C / 107 degrees F
FPC 0 PE2 Temp Sensor	44 degrees C / 111 degrees F
FPC 0 LCPU Temp Sensor	40 degrees C / 104 degrees F

Power

PE0 Core 0.9V	872 mV	28777 mA	25146 mW
PE0 HMC0 Core 0.9V	899 mV	10359 mA	9328 mW
PE1 Core 0.9V	896 mV	29476 mA	26414 mW
PE1 HMC0 Core 0.9V	899 mV	10218 mA	9187 mW
PE2 Core 0.9V	872 mV	28839 mA	25199 mW
PE2 HMC0 Core 0.9V	900 mV	10296 mA	9265 mW
PE0 Serdes 1.0V	1020 mV	29000 mA	29593 mW
PE1 Serdes 1.0V	1019 mV	29109 mA	29718 mW
PE2 Serdes 1.0V	1019 mV	28484 mA	29078 mW
LCPU Platform 1.1V	1099 mV	3515 mA	3867 mW
LCPU Core 1.0V	1000 mV	8750 mA	8703 mW
PHY VDD B 1.0V	1000 mV	17062 mA	17031 mW
PHY VDD A 1.0V	999 mV	15640 mA	15625 mW
BCM Core 1.0V	999 mV	7054 mA	7054 mW
BCM PEX 1.0V	999 mV	3562 mA	3558 mW
HMC Core 1.2V	1199 mV	1280 mA	1513 mW
HMC Serdes 1.2V	1199 mV	32937 mA	39500 mW
VDD 1.5V	1500 mV	2824 mA	4234 mW
VDD 2.5V	2449 mV	3812 mA	9343 mW
VDD 3.3V	3299 mV	5085 mA	16796 mW
12V	12259 mV	29609 mA	368196 mW

FPC 1 status:

State	Online
FPC 1 Intake-A Temp Sensor	37 degrees C / 98 degrees F
FPC 1 Intake-B Temp Sensor	34 degrees C / 93 degrees F
FPC 1 Exhaust-A Temp Sensor	38 degrees C / 100 degrees F
FPC 1 Exhaust-B Temp Sensor	38 degrees C / 100 degrees F
FPC 1 Exhaust-C Temp Sensor	40 degrees C / 104 degrees F
FPC 1 PE0 Temp Sensor	41 degrees C / 105 degrees F
FPC 1 PE1 Temp Sensor	42 degrees C / 107 degrees F
FPC 1 PE2 Temp Sensor	44 degrees C / 111 degrees F
FPC 1 LCPU Temp Sensor	39 degrees C / 102 degrees F

Power

PE0 Core 0.9V	898 mV	29351 mA	26421 mW
---------------	--------	----------	----------

PE0 HMC0 Core 0.9V	899 mV	9734 mA	8750 mW
PE1 Core 0.9V	873 mV	28539 mA	24933 mW
PE1 HMC0 Core 0.9V	899 mV	9937 mA	8937 mW
PE2 Core 0.9V	875 mV	28906 mA	25316 mW
PE2 HMC0 Core 0.9V	899 mV	10140 mA	9125 mW
PE0 Serdes 1.0V	1019 mV	28312 mA	28890 mW
PE1 Serdes 1.0V	1020 mV	28656 mA	29234 mW
PE2 Serdes 1.0V	1020 mV	29437 mA	30015 mW
LCPU Platform 1.1V	1100 mV	4617 mA	5078 mW
LCPU Core 1.0V	1000 mV	8781 mA	8781 mW
PHY VDD B 1.0V	1000 mV	15953 mA	15984 mW
PHY VDD A 1.0V	1000 mV	15484 mA	15484 mW
BCM Core 1.0V	999 mV	7945 mA	7937 mW
BCM PEX 1.0V	999 mV	3515 mA	3515 mW
HMC Core 1.2V	1199 mV	1269 mA	1521 mW
HMC Serdes 1.2V	1199 mV	33000 mA	39593 mW
VDD 1.5V	1500 mV	2691 mA	4062 mW
VDD 2.5V	2449 mV	3582 mA	8781 mW
VDD 3.3V	3300 mV	2563 mA	8458 mW
12V	12311 mV	29002 mA	357577 mW

FPC 2 status:

State	Online
FPC 2 Intake-A Temp Sensor	43 degrees C / 109 degrees F
FPC 2 Intake-B Temp Sensor	30 degrees C / 86 degrees F
FPC 2 Exhaust-A Temp Sensor	50 degrees C / 122 degrees F
FPC 2 Exhaust-B Temp Sensor	52 degrees C / 125 degrees F
FPC 2 Exhaust-C Temp Sensor	51 degrees C / 123 degrees F
FPC 2 PE0 Temp Sensor	48 degrees C / 118 degrees F
FPC 2 PE1 Temp Sensor	56 degrees C / 132 degrees F
FPC 2 PE2 Temp Sensor	48 degrees C / 118 degrees F
FPC 2 PE3 Temp Sensor	57 degrees C / 134 degrees F
FPC 2 PE4 Temp Sensor	48 degrees C / 118 degrees F
FPC 2 PE5 Temp Sensor	60 degrees C / 140 degrees F
FPC 2 LCPU Temp Sensor	47 degrees C / 116 degrees F

Power

PE0 Core 0.9V	874 mV	28117 mA	24617 mW
PE1 Core 0.9V	899 mV	29601 mA	26632 mW
PE0 Serdes 1.0V	1019 mV	41031 mA	41843 mW
PE1 Serdes 1.0V	1019 mV	35656 mA	36343 mW
PE0 HMC Core 0.9V	899 mV	8125 mA	7312 mW
PE0,1 HMC Memory 1.2V	1199 mV	565 mA	688 mW
PE1 HMC Core 0.9V	899 mV	7921 mA	7125 mW
PE0,1 HMC Serdes 1.2V	1199 mV	21281 mA	25562 mW
PE2 Core 0.9V	899 mV	29187 mA	26242 mW
PE3 Core 0.9V	899 mV	29976 mA	27074 mW
PE2 Serdes 1.0V	1019 mV	38562 mA	39343 mW
PE3 Serdes 1.0V	1019 mV	34937 mA	35656 mW
PE2 HMC Core 0.9V	899 mV	8093 mA	7281 mW
PE2,3 HMC Memory 1.2V	1199 mV	610 mA	732 mW
PE3 HMC Core 0.9V	899 mV	7710 mA	6937 mW
PE2,3 HMC Serdes 1.2V	1199 mV	21500 mA	25812 mW
VDD 3.3V	3300 mV	7937 mA	26187 mW
VDD 1.5V	1499 mV	3234 mA	4851 mW
VDD 2.5V	2449 mV	4539 mA	11109 mW
PE4 Core 0.9V	874 mV	29914 mA	26183 mW
PE5 Core 0.9V	874 mV	29820 mA	26031 mW
PE4 Serdes 1.0V	1020 mV	43968 mA	44843 mW
PE5 Serdes 1.0V	1019 mV	27453 mA	28031 mW
PE4 HMC Core 0.9V	900 mV	7937 mA	7140 mW
PE4,5 HMC Memory 1.2V	1200 mV	1185 mA	1421 mW



PE5 HMC Core 0.9V	899 mV	8718 mA	7843 mW
PE4,5 HMC Serdes 1.2V	1199 mV	21125 mA	25343 mW
LCPU platform 1.1V	1099 mV	3777 mA	4156 mW
LCPU core 1.0V	1000 mV	9062 mA	9062 mW
BCM core 1.0V	1000 mV	9328 mA	9328 mW
BCM & PEX Serdes 1.0V	999 mV	4125 mA	4125 mW
12V	12311 mV	53347 mA	660345 mW

FPC 3 status:

State	Online
FPC 3 Intake-A Temp Sensor	43 degrees C / 109 degrees F
FPC 3 Intake-B Temp Sensor	30 degrees C / 86 degrees F
FPC 3 Exhaust-A Temp Sensor	48 degrees C / 118 degrees F
FPC 3 Exhaust-B Temp Sensor	49 degrees C / 120 degrees F
FPC 3 Exhaust-C Temp Sensor	47 degrees C / 116 degrees F
FPC 3 PE0 Temp Sensor	48 degrees C / 118 degrees F
FPC 3 PE1 Temp Sensor	55 degrees C / 131 degrees F
FPC 3 PE2 Temp Sensor	47 degrees C / 116 degrees F
FPC 3 PE3 Temp Sensor	54 degrees C / 129 degrees F
FPC 3 PE4 Temp Sensor	48 degrees C / 118 degrees F
FPC 3 PE5 Temp Sensor	58 degrees C / 136 degrees F
FPC 3 LCPU Temp Sensor	46 degrees C / 114 degrees F

Power

PE0 Core 0.9V	899 mV	29695 mA	26718 mW
PE1 Core 0.9V	899 mV	29695 mA	26710 mW
PE0 Serdes 1.0V	1020 mV	40156 mA	40906 mW
PE1 Serdes 1.0V	1020 mV	35281 mA	35968 mW
PE0 HMC Core 0.9V	900 mV	7492 mA	6742 mW
PE0,1 HMC Memory 1.2V	1199 mV	569 mA	683 mW
PE1 HMC Core 0.9V	899 mV	7570 mA	6812 mW
PE0,1 HMC Serdes 1.2V	1199 mV	20562 mA	24656 mW
PE2 Core 0.9V	899 mV	29734 mA	26765 mW
PE3 Core 0.9V	900 mV	29960 mA	26968 mW
PE2 Serdes 1.0V	1019 mV	37718 mA	38500 mW
PE3 Serdes 1.0V	1020 mV	35250 mA	35937 mW
PE2 HMC Core 0.9V	899 mV	7750 mA	6976 mW
PE2,3 HMC Memory 1.2V	1200 mV	546 mA	656 mW
PE3 HMC Core 0.9V	899 mV	7718 mA	6945 mW
PE2,3 HMC Serdes 1.2V	1199 mV	20625 mA	24750 mW
VDD 3.3V	3299 mV	5917 mA	19515 mW
VDD 1.5V	1499 mV	4015 mA	6015 mW
VDD 2.5V	2449 mV	4335 mA	10625 mW
PE4 Core 0.9V	899 mV	29835 mA	26875 mW
PE5 Core 0.9V	924 mV	30554 mA	28277 mW
PE4 Serdes 1.0V	1019 mV	43281 mA	44187 mW
PE5 Serdes 1.0V	1020 mV	27140 mA	27703 mW
PE4 HMC Core 0.9V	899 mV	7476 mA	6726 mW
PE4,5 HMC Memory 1.2V	1199 mV	531 mA	637 mW
PE5 HMC Core 0.9V	899 mV	7539 mA	6781 mW
PE4,5 HMC Serdes 1.2V	1199 mV	20375 mA	24468 mW
LCPU platform 1.1V	1099 mV	3453 mA	3796 mW
LCPU core 1.0V	999 mV	8984 mA	8984 mW
BCM core 1.0V	999 mV	7929 mA	7921 mW
BCM & PEX Serdes 1.0V	1000 mV	4046 mA	4046 mW
12V	12351 mV	51918 mA	644880 mW

FPC 5 status:

State	Online
FPC 5 Intake-A Temp Sensor	Failed
FPC 5 Intake-B Temp Sensor	Failed
FPC 5 Exhaust-A Temp Sensor	41 degrees C / 105 degrees F
FPC 5 Exhaust-B Temp Sensor	41 degrees C / 105 degrees F

```

FPC 5 Exhaust-C Temp Sensor 42 degrees C / 107 degrees F
FPC 5 PE0 Temp Sensor      47 degrees C / 116 degrees F
FPC 5 PE1 Temp Sensor      49 degrees C / 120 degrees F
FPC 5 PE2 Temp Sensor      53 degrees C / 127 degrees F
FPC 5 LCPU Temp Sensor     Failed

```

## Power

PE0 Core 0.9V	923 mV	30976 mA	28578 mW
PE0 HMC0 Core 0.9V	899 mV	10093 mA	9078 mW
PE1 Core 0.9V	897 mV	29398 mA	26414 mW
PE1 HMC0 Core 0.9V	899 mV	9734 mA	8750 mW
PE2 Core 0.9V	922 mV	30226 mA	27886 mW
PE2 HMC0 Core 0.9V	899 mV	9984 mA	8968 mW
PE0 Serdes 1.0V	1019 mV	29296 mA	29890 mW
PE1 Serdes 1.0V	1020 mV	28687 mA	29296 mW
PE2 Serdes 1.0V	1020 mV	28187 mA	28765 mW
LCPU Platform 1.1V	1100 mV	3664 mA	4031 mW
LCPU Core 1.0V	999 mV	9125 mA	9125 mW
PHY VDD B 1.0V	999 mV	15593 mA	15593 mW
PHY VDD A 1.0V	1000 mV	15453 mA	15453 mW
BCM Core 1.0V	999 mV	7773 mA	7765 mW
BCM PEX 1.0V	1000 mV	3460 mA	3464 mW
HMC Core 1.2V	1199 mV	1328 mA	1628 mW
HMC Serdes 1.2V	1199 mV	32203 mA	38625 mW
VDD 1.5V	1499 mV	2675 mA	4007 mW
VDD 2.5V	2450 mV	3675 mA	9000 mW
VDD 3.3V	3300 mV	1814 mA	5980 mW
12V	12272 mV	29045 mA	361369 mW

## FPC 6 status:

## State

Online

```

FPC 6 Intake-A Temp Sensor 41 degrees C / 105 degrees F
FPC 6 Intake-B Temp Sensor 37 degrees C / 98 degrees F
FPC 6 Exhaust-A Temp Sensor 40 degrees C / 104 degrees F
FPC 6 Exhaust-B Temp Sensor 40 degrees C / 104 degrees F
FPC 6 Exhaust-C Temp Sensor 40 degrees C / 104 degrees F
FPC 6 PE0 Temp Sensor      45 degrees C / 113 degrees F
FPC 6 PE1 Temp Sensor      47 degrees C / 116 degrees F
FPC 6 PE2 Temp Sensor      51 degrees C / 123 degrees F
FPC 6 LCPU Temp Sensor     41 degrees C / 105 degrees F

```

## Power

PE0 Core 0.9V	897 mV	30214 mA	27179 mW
PE0 HMC0 Core 0.9V	899 mV	10000 mA	8984 mW
PE1 Core 0.9V	873 mV	29332 mA	25601 mW
PE1 HMC0 Core 0.9V	899 mV	9828 mA	8828 mW
PE2 Core 0.9V	898 mV	30781 mA	27675 mW
PE2 HMC0 Core 0.9V	899 mV	10328 mA	9296 mW
PE0 Serdes 1.0V	1019 mV	28921 mA	29531 mW
PE1 Serdes 1.0V	1020 mV	29437 mA	30046 mW
PE2 Serdes 1.0V	1019 mV	29671 mA	30281 mW
LCPU Platform 1.1V	1100 mV	3671 mA	4039 mW
LCPU Core 1.0V	1000 mV	8218 mA	8187 mW
PHY VDD B 1.0V	1000 mV	15984 mA	15984 mW
PHY VDD A 1.0V	999 mV	16093 mA	16093 mW
BCM Core 1.0V	1000 mV	8046 mA	8062 mW
BCM PEX 1.0V	1000 mV	3500 mA	3500 mW
HMC Core 1.2V	1199 mV	1327 mA	1579 mW
HMC Serdes 1.2V	1199 mV	33031 mA	39593 mW
VDD 1.5V	1499 mV	2722 mA	4078 mW
VDD 2.5V	2449 mV	3539 mA	8671 mW
VDD 3.3V	3299 mV	8082 mA	26656 mW
12V	12311 mV	31124 mA	385270 mW

## show chassis environment fpc (PTX10016 router)

user@host&gt; show chassis environment fpc

## FPC 1 status:

State	Online
FPC 1 Intake-A Temp Sensor	36 degrees C / 96 degrees F
FPC 1 Intake-B Temp Sensor	32 degrees C / 89 degrees F
FPC 1 Exhaust-A Temp Sensor	37 degrees C / 98 degrees F
FPC 1 Exhaust-B Temp Sensor	36 degrees C / 96 degrees F
FPC 1 Exhaust-C Temp Sensor	36 degrees C / 96 degrees F
FPC 1 PE0 Temp Sensor	45 degrees C / 113 degrees F
FPC 1 PE1 Temp Sensor	46 degrees C / 114 degrees F
FPC 1 PE2 Temp Sensor	53 degrees C / 127 degrees F
FPC 1 LCPU Temp Sensor	35 degrees C / 95 degrees F

## Power

PE0 Core 0.9V	897 mV	28992 mA	26027 mW
PE0 HMC0 Core 0.9V	899 mV	10156 mA	9156 mW
PE1 Core 0.9V	871 mV	28800 mA	25164 mW
PE1 HMC0 Core 0.9V	899 mV	10125 mA	9109 mW
PE2 Core 0.9V	898 mV	29914 mA	26906 mW
PE2 HMC0 Core 0.9V	899 mV	10343 mA	9296 mW
PE0 Serdes 1.0V	1019 mV	27515 mA	28093 mW
PE1 Serdes 1.0V	1020 mV	27968 mA	28546 mW
PE2 Serdes 1.0V	1019 mV	27796 mA	28359 mW
LCPU Platform 1.1V	1100 mV	3347 mA	3289 mW
LCPU Core 1.0V	1000 mV	7960 mA	7960 mW
PHY VDD B 1.0V	1000 mV	16437 mA	16437 mW
PHY VDD A 1.0V	999 mV	15656 mA	15656 mW
BCM Core 1.0V	1000 mV	7289 mA	7335 mW
BCM PEX 1.0V	999 mV	3453 mA	3453 mW
HMC Core 1.2V	1199 mV	1218 mA	1453 mW
HMC Serdes 1.2V	1199 mV	32093 mA	38562 mW
VDD 1.5V	1500 mV	2859 mA	4289 mW
VDD 2.5V	2449 mV	3875 mA	9500 mW
VDD 3.3V	3299 mV	2806 mA	9257 mW
12V	12351 mV	28569 mA	354877 mW

## FPC 3 status:

State	Online
FPC 3 Intake-A Temp Sensor	35 degrees C / 95 degrees F
FPC 3 Intake-B Temp Sensor	31 degrees C / 87 degrees F
FPC 3 Exhaust-A Temp Sensor	36 degrees C / 96 degrees F
FPC 3 Exhaust-B Temp Sensor	34 degrees C / 93 degrees F
FPC 3 Exhaust-C Temp Sensor	33 degrees C / 91 degrees F
FPC 3 PE0 Temp Sensor	43 degrees C / 109 degrees F
FPC 3 PE1 Temp Sensor	45 degrees C / 113 degrees F
FPC 3 PE2 Temp Sensor	49 degrees C / 120 degrees F
FPC 3 LCPU Temp Sensor	35 degrees C / 95 degrees F

## Power

PE0 Core 0.9V	897 mV	28832 mA	25871 mW
PE0 HMC0 Core 0.9V	899 mV	10359 mA	9328 mW
PE1 Core 0.9V	873 mV	28230 mA	24671 mW
PE1 HMC0 Core 0.9V	899 mV	10468 mA	9421 mW
PE2 Core 0.9V	898 mV	29539 mA	26539 mW
PE2 HMC0 Core 0.9V	899 mV	10656 mA	9593 mW
PE0 Serdes 1.0V	1020 mV	27484 mA	28031 mW
PE1 Serdes 1.0V	1019 mV	27515 mA	28078 mW
PE2 Serdes 1.0V	1020 mV	27625 mA	28187 mW
LCPU Platform 1.1V	1099 mV	3050 mA	3355 mW
LCPU Core 1.0V	999 mV	7820 mA	7804 mW

PHY VDD B 1.0V	999 mV	15406 mA	15406 mW
PHY VDD A 1.0V	1000 mV	14953 mA	14953 mW
BCM Core 1.0V	1000 mV	7648 mA	7648 mW
BCM PEX 1.0V	1000 mV	3531 mA	3531 mW
HMC Core 1.2V	1200 mV	1234 mA	1476 mW
HMC Serdes 1.2V	1199 mV	34671 mA	41593 mW
VDD 1.5V	1499 mV	3484 mA	5226 mW
VDD 2.5V	2449 mV	3218 mA	7890 mW
VDD 3.3V	3299 mV	2468 mA	8148 mW
12V	12311 mV	28785 mA	355950 mW

## FPC 6 status:

State	Online
FPC 6 Intake-A Temp Sensor	34 degrees C / 93 degrees F
FPC 6 Intake-B Temp Sensor	31 degrees C / 87 degrees F
FPC 6 Exhaust-A Temp Sensor	34 degrees C / 93 degrees F
FPC 6 Exhaust-B Temp Sensor	35 degrees C / 95 degrees F
FPC 6 Exhaust-C Temp Sensor	35 degrees C / 95 degrees F
FPC 6 PE0 Temp Sensor	42 degrees C / 107 degrees F
FPC 6 PE1 Temp Sensor	43 degrees C / 109 degrees F
FPC 6 PE2 Temp Sensor	47 degrees C / 116 degrees F
FPC 6 LCPU Temp Sensor	34 degrees C / 93 degrees F
Power	

PE0 Core 0.9V	922 mV	29394 mA	27160 mW
PE0 HMC0 Core 0.9V	899 mV	10078 mA	9062 mW
PE1 Core 0.9V	923 mV	29636 mA	27304 mW
PE1 HMC0 Core 0.9V	899 mV	9890 mA	8890 mW
PE2 Core 0.9V	898 mV	29734 mA	26757 mW
PE2 HMC0 Core 0.9V	899 mV	9968 mA	8968 mW
PE0 Serdes 1.0V	1020 mV	26968 mA	27515 mW
PE1 Serdes 1.0V	1019 mV	27421 mA	27984 mW
PE2 Serdes 1.0V	1019 mV	27625 mA	28171 mW
LCPU Platform 1.1V	1099 mV	3230 mA	4742 mW
LCPU Core 1.0V	999 mV	8171 mA	8171 mW
PHY VDD B 1.0V	1000 mV	15671 mA	15687 mW
PHY VDD A 1.0V	999 mV	15703 mA	15703 mW
BCM Core 1.0V	999 mV	7500 mA	7492 mW
BCM PEX 1.0V	1000 mV	3480 mA	3468 mW
HMC Core 1.2V	1199 mV	1199 mA	1440 mW
HMC Serdes 1.2V	1199 mV	31046 mA	37250 mW
VDD 1.5V	1499 mV	2804 mA	4203 mW
VDD 2.5V	2449 mV	3746 mA	9171 mW
VDD 3.3V	3300 mV	3173 mA	10476 mW
12V	12311 mV	28786 mA	355654 mW

## FPC 8 status:

State	Online
FPC 8 Intake-A Temp Sensor	34 degrees C / 93 degrees F
FPC 8 Intake-B Temp Sensor	30 degrees C / 86 degrees F
FPC 8 Exhaust-A Temp Sensor	37 degrees C / 98 degrees F
FPC 8 Exhaust-B Temp Sensor	37 degrees C / 98 degrees F
FPC 8 Exhaust-C Temp Sensor	37 degrees C / 98 degrees F
FPC 8 PE0 Temp Sensor	42 degrees C / 107 degrees F
FPC 8 PE1 Temp Sensor	44 degrees C / 111 degrees F
FPC 8 PE2 Temp Sensor	47 degrees C / 116 degrees F
FPC 8 LCPU Temp Sensor	33 degrees C / 91 degrees F
Power	

PE0 Core 0.9V	897 mV	29382 mA	26437 mW
PE0 HMC0 Core 0.9V	899 mV	10265 mA	9250 mW
PE1 Core 0.9V	872 mV	28867 mA	25175 mW
PE1 HMC0 Core 0.9V	899 mV	10171 mA	9109 mW
PE2 Core 0.9V	899 mV	30210 mA	27214 mW

PE2 HMC0 Core 0.9V	900 mV	10187 mA	9171 mW
PE0 Serdes 1.0V	1020 mV	27843 mA	28421 mW
PE1 Serdes 1.0V	1020 mV	28265 mA	28828 mW
PE2 Serdes 1.0V	1019 mV	28406 mA	29000 mW
LCPU Platform 1.1V	1099 mV	3000 mA	3300 mW
LCPU Core 1.0V	1000 mV	7937 mA	7937 mW
PHY VDD B 1.0V	1000 mV	15843 mA	15843 mW
PHY VDD A 1.0V	1000 mV	15250 mA	15250 mW
BCM Core 1.0V	999 mV	6914 mA	6898 mW
BCM PEX 1.0V	999 mV	3445 mA	3445 mW
HMC Core 1.2V	1199 mV	1162 mA	1390 mW
HMC Serdes 1.2V	1199 mV	33437 mA	40125 mW
VDD 1.5V	1499 mV	2851 mA	4273 mW
VDD 2.5V	2450 mV	3867 mA	9484 mW
VDD 3.3V	3300 mV	3258 mA	10753 mW
12V	12338 mV	28656 mA	356171 mW

FPC 9 status:

State	Online
FPC 9 Intake-A Temp Sensor	44 degrees C / 111 degrees F
FPC 9 Intake-B Temp Sensor	28 degrees C / 82 degrees F
FPC 9 Exhaust-A Temp Sensor	51 degrees C / 123 degrees F
FPC 9 Exhaust-B Temp Sensor	52 degrees C / 125 degrees F
FPC 9 Exhaust-C Temp Sensor	48 degrees C / 118 degrees F
FPC 9 PE0 Temp Sensor	52 degrees C / 125 degrees F
FPC 9 PE1 Temp Sensor	65 degrees C / 149 degrees F
FPC 9 PE2 Temp Sensor	50 degrees C / 122 degrees F
FPC 9 PE3 Temp Sensor	65 degrees C / 149 degrees F
FPC 9 PE4 Temp Sensor	50 degrees C / 122 degrees F
FPC 9 PE5 Temp Sensor	67 degrees C / 152 degrees F
FPC 9 LCPU Temp Sensor	45 degrees C / 113 degrees F

Power

PE0 Core 0.9V	875 mV	28316 mA	24808 mW
PE1 Core 0.9V	875 mV	28546 mA	24996 mW
PE0 Serdes 1.0V	1019 mV	38906 mA	39687 mW
PE1 Serdes 1.0V	1020 mV	33078 mA	33781 mW
PE0 HMC Core 0.9V	899 mV	7718 mA	6945 mW
PE0,1 HMC Memory 1.2V	1199 mV	579 mA	695 mW
PE1 HMC Core 0.9V	899 mV	7289 mA	6570 mW
PE0,1 HMC Serdes 1.2V	1199 mV	20187 mA	24250 mW
PE2 Core 0.9V	924 mV	29062 mA	26894 mW
PE3 Core 0.9V	900 mV	28914 mA	26039 mW
PE2 Serdes 1.0V	1020 mV	36375 mA	37093 mW
PE3 Serdes 1.0V	1019 mV	32640 mA	33296 mW
PE2 HMC Core 0.9V	900 mV	7695 mA	6921 mW
PE2,3 HMC Memory 1.2V	1199 mV	562 mA	674 mW
PE3 HMC Core 0.9V	899 mV	7554 mA	6796 mW
PE2,3 HMC Serdes 1.2V	1199 mV	20156 mA	24218 mW
VDD 3.3V	3300 mV	8964 mA	29609 mW
VDD 1.5V	1499 mV	3968 mA	5945 mW
VDD 2.5V	2449 mV	4414 mA	10890 mW
PE4 Core 0.9V	900 mV	28527 mA	25679 mW
PE5 Core 0.9V	899 mV	28902 mA	26035 mW
PE4 Serdes 1.0V	1019 mV	41281 mA	42125 mW
PE5 Serdes 1.0V	1019 mV	25781 mA	26328 mW
PE4 HMC Core 0.9V	900 mV	7382 mA	6648 mW
PE4,5 HMC Memory 1.2V	1199 mV	626 mA	750 mW
PE5 HMC Core 0.9V	899 mV	7562 mA	6796 mW
PE4,5 HMC Serdes 1.2V	1199 mV	20312 mA	24375 mW
LCPU platform 1.1V	1099 mV	3687 mA	4054 mW
LCPU core 1.0V	1000 mV	9000 mA	9000 mW

BCM core 1.0V	999 mV	7843 mA	7835 mW
BCM & PEX Serdes 1.0V	999 mV	4062 mA	4062 mW
12V	12417 mV	51659 mA	643215 mW

### show chassis environment FPC 1 (MX Routers with Media Services Blade [MSB])

```
user@switch> show chassis environment fpc 1
```

```
FPC 1 status:
State                               Online
Temperature Intake                  36 degrees C / 96 degrees F
Temperature Exhaust A               39 degrees C / 102 degrees F
Temperature LU TSen                 52 degrees C / 125 degrees F
Temperature LU Chip                 54 degrees C / 129 degrees F
Temperature XM TSen                 52 degrees C / 125 degrees F
Temperature XM Chip                 60 degrees C / 140 degrees F
Temperature PCIe TSen               52 degrees C / 125 degrees F
Temperature PCIe Chip               69 degrees C / 156 degrees F
Power
MPC-BIAS3V3-z12106                 3302 mV
MPC-VDD3V3-z16100                  3325 mV
MPC-AVDD1V0-z16100                 1007 mV
MPC-PCIE_1V0-z16100                904 mV
MPC-LU0_1V0-z12004                 996 mV
MPC-VDD_1V5-z12004                 1498 mV
MPC-12VA-BMR453                    11733 mV
MPC-12VB-BMR453                    11728 mV
MPC-XM_0V9-vt273m                  900 mV
I2C Slave Revision                  81
```

### show chassis environment fpc (EX9251 Switches)

```
user@switch> show chassis environment fpc
```

```
FPC 0 status:
State                               Online
Power
I2C Slave Revision                 0
```

### show chassis environment fpc (EX9253 Switches)

```
user@switch> show chassis environment fpc
```

```
FPC 0 status:
State                               Online
FPC 0 Intake Temp Sensor            32 degrees C / 89 degrees F
FPC 0 Exhaust-A Temp Sensor         60 degrees C / 140 degrees F
FPC 0 Exhaust-B Temp Sensor         48 degrees C / 118 degrees F
Power
I2C Slave Revision                  13
FPC 1 status:
State                               Online
FPC 1 Intake Temp Sensor            30 degrees C / 86 degrees F
FPC 1 Exhaust-A Temp Sensor         60 degrees C / 140 degrees F
FPC 1 Exhaust-B Temp Sensor         50 degrees C / 122 degrees F
Power
I2C Slave Revision                  13
```



## show chassis environment fpm

<b>List of Syntax</b>	<a href="#">Syntax on page 1150</a> <a href="#">Syntax (TX Matrix Routers) on page 1150</a> <a href="#">Syntax (TX Matrix Plus Routers) on page 1150</a>
<b>Syntax</b>	show chassis environment fpm
<b>Syntax (TX Matrix Routers)</b>	show chassis environment fpm <lcc <i>number</i>   scc>
<b>Syntax (TX Matrix Plus Routers)</b>	show chassis environment fpm <lcc <i>number</i>   sfc <i>number</i> >
<b>Release Information</b>	<p>Command introduced before Junos OS Release 7.4.</p> <p><b>sfc</b> option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.</p> <p>Command introduced in Junos OS Release 12.1 for T4000 Core Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p>
<b>Description</b>	<p>(M40e, M120, M160, M320, MX Series, and T Series routers and the PTX Series Packet Transport Routers only) Display environmental information about the front panel module in the router.</p>
<b>Options</b>	<p><b>none</b>—(TX Matrix and TX Matrix Plus routers only) On a TX Matrix router, display environmental information about the front panel modules (craft interfaces) on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display environmental information about the front panel modules (craft interfaces) on the TX Matrix Plus router and its attached routers.</p> <p><b>lcc <i>number</i></b>—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.</p> <p>Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> <li>• 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.</li> <li>• 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.</li> </ul>



- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**scc**—(TX Matrix router only) (Optional) Display environmental information about the front panel module (craft interface) on the TX Matrix router (or switch-card chassis).

**sfc number**—(TX Matrix Plus router only) (Optional) Display environmental information about the front panel module (craft interface) on the TX Matrix Plus router (or switch-fabric chassis).

**Required Privilege Level** view

**Related Documentation** [request chassis fpm resync on page 865](#)

**List of Sample Output** [show chassis environment fpm \(M40e and M160 Routers\) on page 1152](#)  
[show chassis environment fpm \(M320 Router\) on page 1152](#)  
[show chassis environment fpm \(MX2010 Router\) on page 1153](#)  
[show chassis environment fpm \(MX2020 Router\) on page 1153](#)  
[show chassis environment fpm \(MX2008 Router\) on page 1153](#)  
[show chassis environment fpm \(MX240 Router\) on page 1153](#)  
[show chassis environment fpm \(MX480 Router\) on page 1153](#)  
[show chassis environment fpm \(T Series Routers\) on page 1153](#)  
[show chassis environment fpm lcc \(TX Matrix Router\) on page 1154](#)  
[show chassis environment fpm scc \(TX Matrix Router\) on page 1154](#)  
[show chassis environment fpm sfc \(TX Matrix Plus Router\) on page 1154](#)  
[show chassis environment fpm \(T4000 Core Router\) on page 1155](#)  
[show chassis environment fpm \(PTX5000 Packet Transport Router\) on page 1156](#)

**Output Fields** [Table 103 on page 1151](#) lists the output fields for the **show chassis environment fpm** command. Output fields are listed in the approximate order in which they appear.

*Table 103: show chassis environment fpm Output Fields*

Field Name	Field Description
<b>State</b>	FPM status: <ul style="list-style-type: none"> <li>• <b>Online</b>—FPM is online and running.</li> <li>• <b>Offline</b>—FPM is powered down.</li> </ul>
<b>FPM CMB Voltage</b>	(M40e and M160 routers only) Information about the voltage supplied to the FPM chassis management bus (CMB) device. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.

Table 103: show chassis environment fpm Output Fields (continued)

Field Name	Field Description
<b>FPM GBUS Voltage</b>	(M320 and T Series routers only) Information about the voltage supplied to the FPM generic bus (GBUS) device. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
<b>FPM I2CS Voltage</b>	(PTX Series only) Information about the voltage supplied to the FPM generic bus (I2CS) device. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
<b>FPM Display Voltage</b>	Information about the voltage supplied to the FPM display. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
<b>FPM CMB Temperature</b>	(M40e and M160 routers only) Temperature of the air flowing past the FPM CMB device
<b>FPM GBUS Temperature</b>	(M320 and T Series routers only) Temperature of the air flowing past the FPM GBUS device.
<b>FPM I2CS Temperature</b>	(PTX Series only) Temperature of the air flowing past the FPM I2CS device.
<b>FPM Display Temperature</b>	Temperature of the air flowing past the FPM display.
<b>CMB Revision</b>	(M40e and M160 routers only) Revision level of the CMB device.
<b>GBUS Revision</b>	(M320 and T Series routers only) Revision level of the GBUS device.
<b>I2CS Revision</b>	(MX2010 routers, MX2020 routers, MX2008 routers, and PTX Series only) Revision level of the I2CS device.

## Sample Output

### show chassis environment fpm (M40e and M160 Routers)

```

user@host> show chassis environment fpm

FPM status:
State                               Online
FPM CMB Voltage:
  5.0 V bias                        5030 mV
  8.0 V bias                        8083 mV
FPM Display Voltage:
  5.0 V bias                        4998 mV
FPM CMB temperature                 34 degrees C / 93 degrees F
FPM Display temperature             35 degrees C / 95 degrees F
CMB Revision                        12

```

### show chassis environment fpm (M320 Router)

```

user@host> show chassis environment fpm

FPM status:
State                               Online

```

```

FPM GBUS Voltage:
  5.0 V          5006 mV
  1.8 V bias     1799 mV
  3.3 V bias     3294 mV
  5.0 V bias     4998 mV
  8.0 V bias     7682 mV
FPM GBUS temperature 30 degrees C / 86 degrees F
GBUS Revision       51

```

#### show chassis environment fpm (MX2010 Router)

```
user@host > show chassis environment fpm
```

```

FPM status:
  State          Online
  I2CS Revision  4

```

#### show chassis environment fpm (MX2020 Router)

```
user@host > show chassis environment fpm
```

```

FPM status:
  State          Online
  I2CS Revision  3

```

#### show chassis environment fpm (MX2008 Router)

```
user@host > show chassis environment fpm
```

```

FPM status:
  State          Online
  I2CS Revision  5

```

#### show chassis environment fpm (MX240 Router)

```
user@host> show chassis environment fpm
```

```

FPM status:
  State          Online
  I2CS Revision  41

```

#### show chassis environment fpm (MX480 Router)

```
user@host> show chassis environment fpm
```

```

FPM status:
  State          Online
  I2CS Revision  41

```

#### show chassis environment fpm (T Series Routers)

```
user@host> show chassis environment fpm
```

```

FPM status:
  State          Online
  FPM GBUS Voltage:
    1.8 V bias    1787 mV
    3.3 V bias    3286 mV

```

```

5.0 V bias          4991 mV
8.0 V bias          7162 mV
FPM Display Voltage:
5.0 V              4996 mV
FPM GBUS temperature 29 degrees C / 84 degrees F
FPM Display temperature 26 degrees C / 78 degrees F
GBUS Revision       37

```

#### show chassis environment fpm lcc (TX Matrix Router)

```

user@host> show chassis environment fpm lcc 0

lcc0-re0:
-----
FPM status:
State          Online
FPM GBUS Voltage:
1.8 V bias     1797 mV
3.3 V bias     3294 mV
5.0 V bias     5015 mV
8.0 V bias     7470 mV
FPM Display Voltage:
5.0 V          5018 mV
FPM GBUS temperature 25 degrees C / 77 degrees F
FPM Display temperature 29 degrees C / 84 degrees F
GBUS Revision   37

```

#### show chassis environment fpm scc (TX Matrix Router)

```

user@host> show chassis environment fpm scc

scc-re0:
-----
FPM status:
State          Online
FPM GBUS Voltage:
1.8 V bias     1789 mV
3.3 V bias     3296 mV
5.0 V bias     5003 mV
8.0 V bias     7592 mV
FPM Display Voltage:
5.0 V          5010 mV
FPM GBUS temperature 22 degrees C / 71 degrees F
FPM Display temperature 27 degrees C / 80 degrees F
GBUS Revision   37

```

#### show chassis environment fpm sfc (TX Matrix Plus Router)

```

user@host> show chassis environment fpm sfc

sfc0-re0:
-----
FPM status:
State          Online
FPM I2CS Voltage:
3.3 V          3300 mV
5.0 V          5001 mV
9.0 V FPD      8672 mV

```

```
FPM I2CS temperature      33 degrees C / 91 degrees F
I2CS Revision             69
```

```
1cc0-re0:
```

```
FPM status:
```

```
State                     Online
FPM GBUS Voltage:
  1.8 V bias              1802 mV
  3.3 V bias              3301 mV
  5.0 V bias              4984 mV
  8.0 V bias              7377 mV
FPM Display Voltage:
  5.0 V                   5015 mV
FPM GBUS temperature      30 degrees C / 86 degrees F
FPM Display temperature   32 degrees C / 89 degrees F
GBUS Revision             37
```

```
1cc1-re0:
```

```
FPM status:
```

```
State                     Online
FPM GBUS Voltage:
  1.8 V bias              1789 mV
  3.3 V bias              3311 mV
  5.0 V bias              5013 mV
  8.0 V bias              7467 mV
FPM Display Voltage:
  5.0 V                   5015 mV
FPM GBUS temperature      29 degrees C / 84 degrees F
FPM Display temperature   31 degrees C / 87 degrees F
GBUS Revision             37
```

### show chassis environment fpm (T4000 Core Router)

```
user@host> show chassis environment fpm
```

```
CB 0 status:
```

```
State                     Online Master
Temperature               34 degrees C / 93 degrees F
Power 1
  1.8 V                   1804 mV
  2.5 V                   2499 mV
  3.3 V                   3317 mV
  3.3 V bias              3291 mV
  4.6 V                   4663 mV
  5.0 V                   4905 mV
  8.0 V bias              7658 mV
  12.0 V                  11877 mV
Power 2
  1.0 V                   996 mV
  1.2 V                   1207 mV
  3.3 V RE                3354 mV
Bus Revision              51
FPGA Revision             5
```

```
CB 1 status:
```

```
State                     Online Standby
Temperature               36 degrees C / 96 degrees F
Power 1
  1.8 V                   1791 mV
```

```
2.5 V          2494 mV
3.3 V          3321 mV
3.3 V bias     3301 mV
4.6 V          4666 mV
5.0 V          4945 mV
8.0 V bias     7645 mV
12.0 V         11897 mV
Power 2
1.0 V          991 mV
1.2 V          1201 mV
3.3 V RE       3289 mV
Bus Revision   51
FPGA Revision  5

user@host> show chassis environment fpm
FPM status:
State          Online
FPM GBUS Voltage:
  1.8 V bias    1802 mV
  3.3 V bias    3294 mV
  5.0 V bias    5003 mV
  8.0 V bias    7306 mV
FPM Display Voltage:
  5.0 V         5010 mV
FPM GBUS temperature 26 degrees C / 78 degrees F
FPM Display temperature 29 degrees C / 84 degrees F
GBUS Revision       37
```

#### show chassis environment fpm (PTX5000 Packet Transport Router)

```
user@host> show chassis environment fpm

FPM status:
State          Online
FPM I2CS Voltage:
  3.3 V         3300 mV
  5.0 V         4975 mV
FPM I2CS temperature 37 degrees C / 98 degrees F
I2CS Revision   109
```

## show chassis environment monitored

<b>List of Syntax</b>	<a href="#">Syntax on page 1157</a> <a href="#">Syntax (MX2020, MX2010, and MX2008 Routers) on page 1157</a>
<b>Syntax</b>	show chassis environment monitored
<b>Syntax (MX2020, MX2010, and MX2008 Routers)</b>	show chassis environment monitored <all-members> <local> <member <i>member-id</i> >
<b>Release Information</b>	<p>Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Routers. Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms. Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms. <b>all-members</b>, <b>local</b>, and <b>member <i>member-id</i></b> options introduced in Junos OS Release 15.1 for MX2020 and MX2010 routers.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms. Command introduced in Junos OS Release 18.2 for MX10008 Universal Routing Platforms.</p>
<b>Description</b>	<p>(PTX Series Packet Transport Routers, MX2010, MX2020, MX2008, and MX10008 routers) Display status information for monitored temperatures.</p> <p>On the PTX Series Packet Transport Routers, and on MX2010, MX2020, MX2008, and MX10008 routers, you can configure which temperatures are monitored for computing temperature alarms. Use this command to display only the temperatures that are monitored. Temperatures that are not included in the temperature alarm computations are not displayed.</p>
<b>Options</b>	<p><b>none</b>—Display status information for monitored temperatures.</p> <p><b>all-members</b>—(MX2010, MX2020, and MX2008 routers only) (Optional) Display chassis information for monitored temperatures in all members of the Virtual Chassis configuration.</p> <p><b>local</b>—(MX2010, MX2020, and MX2008 routers only) (Optional) Display chassis information for monitored temperatures in the local member of the Virtual Chassis.</p> <p><b>member <i>member-id</i></b>—(MX2010, MX2020, and MX2008 routers only) (Optional) Display chassis information for monitored temperatures in the specified member of the Virtual Chassis. Replace <b><i>member-id</i></b> with the value 0 or 1.</p>
<b>Required Privilege Level</b>	view

- Related Documentation**
- [show chassis environment on page 969](#)
  - *Chassis-Level Feature Guide*

- List of Sample Output**
- [show chassis environment monitored \(PTX3000 Packet Transport Router\) on page 1158](#)
  - [show chassis environment monitored \(PTX5000 Packet Transport Router\) on page 1159](#)
  - [show chassis environment monitored \(MX2010 Router\) on page 1159](#)
  - [show chassis environment monitored \(MX2020 Router\) on page 1162](#)
  - [show chassis environment monitored \(MX2008 Router\) on page 1171](#)
  - [show chassis environment monitored \(MX10008 Router\) on page 1174](#)

**Output Fields** Table 104 on page 1158 lists the output fields for the **show chassis environment monitored** command. Output fields are listed in the approximate order in which they appear.

*Table 104: show chassis environment monitored Output Fields*

Field Name	Field Description
<b>Item</b>	Chassis component: <ul style="list-style-type: none"> <li>• (PTX Series Packet Transport Routers, and MX2010, MX2020, and Mx2008 routers)—Information about the chassis, Routing Engines, Control Boards (CBs), Switch Interface Boards (SIBs), PICs, and Flexible PIC Concentrators (FPCs).</li> </ul>
<b>Status</b>	Status of the specified item: <b>OK</b> , <b>Alarm</b> , or <b>Present</b> .
<b>Measurement</b>	Temperature of the air flowing past the specified chassis component. Temperature is displayed in degrees Celsius (C) and degrees Fahrenheit (F).

## Sample Output

### show chassis environment monitored (PTX3000 Packet Transport Router)

```
user@host> show chassis environment monitored
```

Class	Item	Status	Measurement
	Routing Engine 0 CPU	OK	54 degrees C / 129 degrees F
	Routing Engine 1 CPU	Present	
	CB 0 Exhaust A	OK	25 degrees C / 77 degrees F
	CB 1 Exhaust A	OK	22 degrees C / 71 degrees F
	SIB 0 Exhaust	OK	34 degrees C / 93 degrees F
	SIB 0 TF	OK	42 degrees C / 107 degrees F
	SIB 1 Exhaust	OK	31 degrees C / 87 degrees F
	SIB 1 TF	OK	41 degrees C / 105 degrees F
	SIB 2 Exhaust	OK	32 degrees C / 89 degrees F
	SIB 2 TF	OK	40 degrees C / 104 degrees F
	SIB 3 Exhaust	OK	32 degrees C / 89 degrees F
	SIB 3 TF	OK	40 degrees C / 104 degrees F
	SIB 4 Exhaust	OK	31 degrees C / 87 degrees F
	SIB 4 TF	OK	40 degrees C / 104 degrees F
	SIB 5 Exhaust	OK	31 degrees C / 87 degrees F
	SIB 5 TF	OK	39 degrees C / 102 degrees F
	SIB 6 Exhaust	OK	31 degrees C / 87 degrees F
	SIB 6 TF	OK	39 degrees C / 102 degrees F
	SIB 7 Exhaust	OK	35 degrees C / 95 degrees F



SIB 7 TF	OK	40 degrees C / 104 degrees F
SIB 8 Exhaust	OK	32 degrees C / 89 degrees F
SIB 8 TF	OK	40 degrees C / 104 degrees F
FPC 2 PMB CPU	OK	67 degrees C / 152 degrees F
FPC 2 Exhaust	OK	40 degrees C / 104 degrees F
FPC 2 Intake	OK	33 degrees C / 91 degrees F
FPC 2 TL0	OK	69 degrees C / 156 degrees F
FPC 2 TQ0	OK	60 degrees C / 140 degrees F
FPC 2 TL1	OK	56 degrees C / 132 degrees F
FPC 2 TQ1	OK	45 degrees C / 113 degrees F
PIC Ambient	OK	40 degrees C / 104 degrees F
FPC 6 PMB CPU	OK	80 degrees C / 176 degrees F
FPC 6 Exhaust	OK	53 degrees C / 127 degrees F
FPC 6 Intake	OK	36 degrees C / 96 degrees F
FPC 6 TL0	OK	69 degrees C / 156 degrees F
FPC 6 TQ0	OK	65 degrees C / 149 degrees F
FPC 6 TL1	OK	52 degrees C / 125 degrees F
FPC 6 TQ1	OK	47 degrees C / 116 degrees F
PIC Ambient	OK	46 degrees C / 114 degrees F
FPC 12 PMB CPU	OK	42 degrees C / 107 degrees F
FPC 12 Intake	OK	33 degrees C / 91 degrees F
FPC 12 Exhaust	OK	41 degrees C / 105 degrees F
FPC 12 TL0	OK	48 degrees C / 118 degrees F
FPC 12 TQ0	OK	45 degrees C / 113 degrees F
FPC 12 TL1	OK	58 degrees C / 136 degrees F
FPC 12 TQ1	OK	50 degrees C / 122 degrees F
PIC Ambient	OK	56 degrees C / 132 degrees F
PIC 100G_OTN_LH-12/0/0	OK	74 degrees C / 165 degrees F
PIC 100G_OTN_LH-12/0/1	OK	93 degrees C / 199 degrees F

### show chassis environment monitored (PTX5000 Packet Transport Router)

```
user@host> show chassis environment monitored
```

Class	Item	Status	Measurement
	Routing Engine 0 CPU	OK	71 degrees C / 159 degrees F
	Routing Engine 1 CPU	OK	62 degrees C / 143 degrees F
	CB 0 Exhaust A	OK	45 degrees C / 113 degrees F
	CB 0 Exhaust B	OK	41 degrees C / 105 degrees F
	CB 1 Exhaust A	OK	39 degrees C / 102 degrees F
	CB 1 Exhaust B	OK	36 degrees C / 96 degrees F

### show chassis environment monitored (MX2010 Router)

```
user@host > show chassis environment monitored
```

Class	Item	Status	Measurement
Temp	CB 0 IntakeA-Zone0	OK	37 degrees C / 98 degrees F
	CB 0 IntakeB-Zone1	OK	31 degrees C / 87 degrees F
	CB 0 IntakeC-Zone0	OK	39 degrees C / 102 degrees F
	CB 0 ExhaustA-Zone0	OK	36 degrees C / 96 degrees F
	CB 0 ExhaustB-Zone1	OK	32 degrees C / 89 degrees F
	CB 0 TCBC-Zone0	OK	34 degrees C / 93 degrees F
	CB 1 IntakeA-Zone0	OK	36 degrees C / 96 degrees F
	CB 1 IntakeB-Zone1	OK	28 degrees C / 82 degrees F
	CB 1 IntakeC-Zone0	OK	38 degrees C / 100 degrees F
	CB 1 ExhaustA-Zone0	OK	36 degrees C / 96 degrees F

CB 1 ExhaustB-Zone1	OK	30 degrees C / 86 degrees F
CB 1 TCBC-Zone0	OK	33 degrees C / 91 degrees F
SPMB 0 Intake	OK	30 degrees C / 86 degrees F
SPMB 1 Intake	OK	28 degrees C / 82 degrees F
Routing Engine 0 CPU	OK	32 degrees C / 89 degrees F
Routing Engine 1 CPU	Present	
SFB 0 Intake-Zone0	OK	46 degrees C / 114 degrees F
SFB 0 Exhaust-Zone1	OK	38 degrees C / 100 degrees F
SFB 0 IntakeA-Zone0	OK	35 degrees C / 95 degrees F
SFB 0 IntakeB-Zone1	OK	31 degrees C / 87 degrees F
SFB 0 Exhaust-Zone0	OK	39 degrees C / 102 degrees F
SFB 0 SFB-XF2-Zone1	OK	44 degrees C / 111 degrees F
SFB 0 SFB-XF1-Zone0	OK	47 degrees C / 116 degrees F
SFB 0 SFB-XF0-Zone0	OK	56 degrees C / 132 degrees F
SFB 1 Intake-Zone0	OK	34 degrees C / 93 degrees F
SFB 1 Exhaust-Zone1	OK	34 degrees C / 93 degrees F
SFB 1 IntakeA-Zone0	OK	29 degrees C / 84 degrees F
SFB 1 IntakeB-Zone1	OK	29 degrees C / 84 degrees F
SFB 1 Exhaust-Zone0	OK	32 degrees C / 89 degrees F
SFB 1 SFB-XF2-Zone1	OK	42 degrees C / 107 degrees F
SFB 1 SFB-XF1-Zone0	OK	40 degrees C / 104 degrees F
SFB 1 SFB-XF0-Zone0	OK	42 degrees C / 107 degrees F
SFB 2 Intake-Zone0	OK	33 degrees C / 91 degrees F
SFB 2 Exhaust-Zone1	OK	33 degrees C / 91 degrees F
SFB 2 IntakeA-Zone0	OK	28 degrees C / 82 degrees F
SFB 2 IntakeB-Zone1	OK	28 degrees C / 82 degrees F
SFB 2 Exhaust-Zone0	OK	31 degrees C / 87 degrees F
SFB 2 SFB-XF2-Zone1	OK	41 degrees C / 105 degrees F
SFB 2 SFB-XF1-Zone0	OK	39 degrees C / 102 degrees F
SFB 2 SFB-XF0-Zone0	OK	42 degrees C / 107 degrees F
SFB 3 Intake-Zone0	OK	33 degrees C / 91 degrees F
SFB 3 Exhaust-Zone1	OK	33 degrees C / 91 degrees F
SFB 3 IntakeA-Zone0	OK	29 degrees C / 84 degrees F
SFB 3 IntakeB-Zone1	OK	28 degrees C / 82 degrees F
SFB 3 Exhaust-Zone0	OK	31 degrees C / 87 degrees F
SFB 3 SFB-XF2-Zone1	OK	43 degrees C / 109 degrees F
SFB 3 SFB-XF1-Zone0	OK	40 degrees C / 104 degrees F
SFB 3 SFB-XF0-Zone0	OK	42 degrees C / 107 degrees F
SFB 4 Intake-Zone0	OK	34 degrees C / 93 degrees F
SFB 4 Exhaust-Zone1	OK	34 degrees C / 93 degrees F
SFB 4 IntakeA-Zone0	OK	29 degrees C / 84 degrees F
SFB 4 IntakeB-Zone1	OK	28 degrees C / 82 degrees F
SFB 4 Exhaust-Zone0	OK	32 degrees C / 89 degrees F
SFB 4 SFB-XF2-Zone1	OK	43 degrees C / 109 degrees F
SFB 4 SFB-XF1-Zone0	OK	42 degrees C / 107 degrees F
SFB 4 SFB-XF0-Zone0	OK	43 degrees C / 109 degrees F
SFB 5 Intake-Zone0	OK	34 degrees C / 93 degrees F
SFB 5 Exhaust-Zone1	OK	34 degrees C / 93 degrees F
SFB 5 IntakeA-Zone0	OK	30 degrees C / 86 degrees F
SFB 5 IntakeB-Zone1	OK	28 degrees C / 82 degrees F
SFB 5 Exhaust-Zone0	OK	32 degrees C / 89 degrees F
SFB 5 SFB-XF2-Zone1	OK	41 degrees C / 105 degrees F
SFB 5 SFB-XF1-Zone0	OK	41 degrees C / 105 degrees F
SFB 5 SFB-XF0-Zone0	OK	44 degrees C / 111 degrees F
SFB 6 Intake-Zone0	OK	35 degrees C / 95 degrees F
SFB 6 Exhaust-Zone1	OK	34 degrees C / 93 degrees F
SFB 6 IntakeA-Zone0	OK	30 degrees C / 86 degrees F
SFB 6 IntakeB-Zone1	OK	29 degrees C / 84 degrees F
SFB 6 Exhaust-Zone0	OK	33 degrees C / 91 degrees F
SFB 6 SFB-XF2-Zone1	OK	44 degrees C / 111 degrees F

SFB 6 SFB-XF1-Zone0	OK	43 degrees C / 109 degrees F
SFB 6 SFB-XF0-Zone0	OK	46 degrees C / 114 degrees F
SFB 7 Intake-Zone0	OK	39 degrees C / 102 degrees F
SFB 7 Exhaust-Zone1	OK	34 degrees C / 93 degrees F
SFB 7 IntakeA-Zone0	OK	34 degrees C / 93 degrees F
SFB 7 IntakeB-Zone1	OK	29 degrees C / 84 degrees F
SFB 7 Exhaust-Zone0	OK	37 degrees C / 98 degrees F
SFB 7 SFB-XF2-Zone1	OK	43 degrees C / 109 degrees F
SFB 7 SFB-XF1-Zone0	OK	47 degrees C / 116 degrees F
SFB 7 SFB-XF0-Zone0	OK	52 degrees C / 125 degrees F
FPC 0 Intake	OK	36 degrees C / 96 degrees F
FPC 0 Exhaust A	OK	42 degrees C / 107 degrees F
FPC 0 Exhaust B	OK	51 degrees C / 123 degrees F
FPC 0 LU 0 TSen	OK	49 degrees C / 120 degrees F
FPC 0 LU 0 Chip	OK	50 degrees C / 122 degrees F
FPC 0 LU 1 TSen	OK	49 degrees C / 120 degrees F
FPC 0 LU 1 Chip	OK	54 degrees C / 129 degrees F
FPC 0 LU 2 TSen	OK	49 degrees C / 120 degrees F
FPC 0 LU 2 Chip	OK	45 degrees C / 113 degrees F
FPC 0 LU 3 TSen	OK	49 degrees C / 120 degrees F
FPC 0 LU 3 Chip	OK	46 degrees C / 114 degrees F
FPC 0 MQ 0 TSen	OK	40 degrees C / 104 degrees F
FPC 0 MQ 0 Chip	OK	41 degrees C / 105 degrees F
FPC 0 MQ 1 TSen	OK	40 degrees C / 104 degrees F
FPC 0 MQ 1 Chip	OK	44 degrees C / 111 degrees F
FPC 0 MQ 2 TSen	OK	40 degrees C / 104 degrees F
FPC 0 MQ 2 Chip	OK	38 degrees C / 100 degrees F
FPC 0 MQ 3 TSen	OK	40 degrees C / 104 degrees F
FPC 0 MQ 3 Chip	OK	41 degrees C / 105 degrees F
FPC 1 Intake	OK	34 degrees C / 93 degrees F
FPC 1 Exhaust A	OK	46 degrees C / 114 degrees F
FPC 1 Exhaust B	OK	54 degrees C / 129 degrees F
FPC 1 LU 0 TSen	OK	45 degrees C / 113 degrees F
FPC 1 LU 0 Chip	OK	55 degrees C / 131 degrees F
FPC 1 LU 1 TSen	OK	45 degrees C / 113 degrees F
FPC 1 LU 1 Chip	OK	44 degrees C / 111 degrees F
FPC 1 LU 2 TSen	OK	45 degrees C / 113 degrees F
FPC 1 LU 2 Chip	OK	50 degrees C / 122 degrees F
FPC 1 LU 3 TSen	OK	45 degrees C / 113 degrees F
FPC 1 LU 3 Chip	OK	58 degrees C / 136 degrees F
FPC 1 XM 0 TSen	OK	45 degrees C / 113 degrees F
FPC 1 XM 0 Chip	OK	52 degrees C / 125 degrees F
FPC 1 XF 0 TSen	OK	45 degrees C / 113 degrees F
FPC 1 XF 0 Chip	OK	63 degrees C / 145 degrees F
FPC 1 PLX Switch TSen	OK	45 degrees C / 113 degrees F
FPC 1 PLX Switch Chip	OK	47 degrees C / 116 degrees F
FPC 8 Intake	OK	32 degrees C / 89 degrees F
FPC 8 Exhaust A	OK	44 degrees C / 111 degrees F
FPC 8 Exhaust B	OK	37 degrees C / 98 degrees F
FPC 8 LU 0 TCAM TSen	OK	41 degrees C / 105 degrees F
FPC 8 LU 0 TCAM Chip	OK	49 degrees C / 120 degrees F
FPC 8 LU 0 TSen	OK	41 degrees C / 105 degrees F
FPC 8 LU 0 Chip	OK	52 degrees C / 125 degrees F
FPC 8 MQ 0 TSen	OK	41 degrees C / 105 degrees F
FPC 8 MQ 0 Chip	OK	47 degrees C / 116 degrees F
FPC 8 LU 1 TCAM TSen	OK	39 degrees C / 102 degrees F
FPC 8 LU 1 TCAM Chip	OK	42 degrees C / 107 degrees F
FPC 8 LU 1 TSen	OK	39 degrees C / 102 degrees F
FPC 8 LU 1 Chip	OK	46 degrees C / 114 degrees F
FPC 8 MQ 1 TSen	OK	39 degrees C / 102 degrees F

FPC 8 MQ 1 Chip	OK	45 degrees C / 113 degrees F
FPC 9 Intake	OK	34 degrees C / 93 degrees F
FPC 9 Exhaust A	OK	41 degrees C / 105 degrees F
FPC 9 Exhaust B	OK	54 degrees C / 129 degrees F
FPC 9 LU 0 TSen	OK	51 degrees C / 123 degrees F
FPC 9 LU 0 Chip	OK	52 degrees C / 125 degrees F
FPC 9 LU 1 TSen	OK	51 degrees C / 123 degrees F
FPC 9 LU 1 Chip	OK	55 degrees C / 131 degrees F
FPC 9 LU 2 TSen	OK	51 degrees C / 123 degrees F
FPC 9 LU 2 Chip	OK	47 degrees C / 116 degrees F
FPC 9 LU 3 TSen	OK	51 degrees C / 123 degrees F
FPC 9 LU 3 Chip	OK	47 degrees C / 116 degrees F
FPC 9 MQ 0 TSen	OK	40 degrees C / 104 degrees F
FPC 9 MQ 0 Chip	OK	42 degrees C / 107 degrees F
FPC 9 MQ 1 TSen	OK	40 degrees C / 104 degrees F
FPC 9 MQ 1 Chip	OK	44 degrees C / 111 degrees F
FPC 9 MQ 2 TSen	OK	40 degrees C / 104 degrees F
FPC 9 MQ 2 Chip	OK	38 degrees C / 100 degrees F
FPC 9 MQ 3 TSen	OK	40 degrees C / 104 degrees F
FPC 9 MQ 3 Chip	OK	40 degrees C / 104 degrees F
ADC 0 Intake	OK	35 degrees C / 95 degrees F
ADC 0 Exhaust	OK	44 degrees C / 111 degrees F
ADC 0 ADC-XF1	OK	48 degrees C / 118 degrees F
ADC 0 ADC-XF0	OK	59 degrees C / 138 degrees F
ADC 1 Intake	OK	34 degrees C / 93 degrees F
ADC 1 Exhaust	OK	45 degrees C / 113 degrees F
ADC 1 ADC-XF1	OK	53 degrees C / 127 degrees F
ADC 1 ADC-XF0	OK	56 degrees C / 132 degrees F
ADC 8 Intake	OK	35 degrees C / 95 degrees F
ADC 8 Exhaust	OK	41 degrees C / 105 degrees F
ADC 8 ADC-XF1	OK	52 degrees C / 125 degrees F
ADC 8 ADC-XF0	OK	55 degrees C / 131 degrees F
ADC 9 Intake	OK	33 degrees C / 91 degrees F
ADC 9 Exhaust	OK	42 degrees C / 107 degrees F
ADC 9 ADC-XF1	OK	55 degrees C / 131 degrees F
ADC 9 ADC-XF0	OK	56 degrees C / 132 degrees F

### show chassis environment monitored (MX2020 Router)

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user@host > show chassis environment monitored
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Class	Item	Status	Measurement
Temp	CB 0 IntakeA-Zone0	OK	44 degrees C / 111 degrees F
	CB 0 IntakeB-Zone1	OK	34 degrees C / 93 degrees F
	CB 0 IntakeC-Zone0	OK	46 degrees C / 114 degrees F
	CB 0 ExhaustA-Zone0	OK	44 degrees C / 111 degrees F
	CB 0 ExhaustB-Zone1	OK	36 degrees C / 96 degrees F
	CB 0 TCBC-Zone0	OK	39 degrees C / 102 degrees F
	CB 1 IntakeA-Zone0	OK	46 degrees C / 114 degrees F
	CB 1 IntakeB-Zone1	OK	43 degrees C / 109 degrees F
	CB 1 IntakeC-Zone0	OK	47 degrees C / 116 degrees F
	CB 1 ExhaustA-Zone0	OK	45 degrees C / 113 degrees F
	CB 1 ExhaustB-Zone1	OK	42 degrees C / 107 degrees F
	CB 1 TCBC-Zone0	OK	46 degrees C / 114 degrees F
	SPMB 0 Intake	OK	33 degrees C / 91 degrees F
	SPMB 1 Intake	OK	43 degrees C / 109 degrees F
	Routing Engine 0 CPU	OK	34 degrees C / 93 degrees F
	Routing Engine 1 CPU	OK	42 degrees C / 107 degrees F
	SFB 0 Intake-Zone0	OK	52 degrees C / 125 degrees F
	SFB 0 Exhaust-Zone1	OK	45 degrees C / 113 degrees F

SFB 0 IntakeA-Zone0	OK	47 degrees C / 116 degrees F
SFB 0 IntakeB-Zone1	OK	38 degrees C / 100 degrees F
SFB 0 Exhaust-Zone0	OK	49 degrees C / 120 degrees F
SFB 0 SFB-XF2-Zone1	OK	59 degrees C / 138 degrees F
SFB 0 SFB-XF1-Zone0	OK	65 degrees C / 149 degrees F
SFB 0 SFB-XF0-Zone0	OK	65 degrees C / 149 degrees F
SFB 1 Intake-Zone0	OK	53 degrees C / 127 degrees F
SFB 1 Exhaust-Zone1	OK	45 degrees C / 113 degrees F
SFB 1 IntakeA-Zone0	OK	48 degrees C / 118 degrees F
SFB 1 IntakeB-Zone1	OK	39 degrees C / 102 degrees F
SFB 1 Exhaust-Zone0	OK	48 degrees C / 118 degrees F
SFB 1 SFB-XF2-Zone1	OK	60 degrees C / 140 degrees F
SFB 1 SFB-XF1-Zone0	OK	64 degrees C / 147 degrees F
SFB 1 SFB-XF0-Zone0	OK	66 degrees C / 150 degrees F
SFB 2 Intake-Zone0	OK	54 degrees C / 129 degrees F
SFB 2 Exhaust-Zone1	OK	46 degrees C / 114 degrees F
SFB 2 IntakeA-Zone0	OK	48 degrees C / 118 degrees F
SFB 2 IntakeB-Zone1	OK	39 degrees C / 102 degrees F
SFB 2 Exhaust-Zone0	OK	50 degrees C / 122 degrees F
SFB 2 SFB-XF2-Zone1	OK	63 degrees C / 145 degrees F
SFB 2 SFB-XF1-Zone0	OK	67 degrees C / 152 degrees F
SFB 2 SFB-XF0-Zone0	OK	67 degrees C / 152 degrees F
SFB 3 Intake-Zone0	OK	54 degrees C / 129 degrees F
SFB 3 Exhaust-Zone1	OK	46 degrees C / 114 degrees F
SFB 3 IntakeA-Zone0	OK	50 degrees C / 122 degrees F
SFB 3 IntakeB-Zone1	OK	40 degrees C / 104 degrees F
SFB 3 Exhaust-Zone0	OK	50 degrees C / 122 degrees F
SFB 3 SFB-XF2-Zone1	OK	64 degrees C / 147 degrees F
SFB 3 SFB-XF1-Zone0	OK	66 degrees C / 150 degrees F
SFB 3 SFB-XF0-Zone0	OK	68 degrees C / 154 degrees F
SFB 4 Intake-Zone0	OK	55 degrees C / 131 degrees F
SFB 4 Exhaust-Zone1	OK	48 degrees C / 118 degrees F
SFB 4 IntakeA-Zone0	OK	51 degrees C / 123 degrees F
SFB 4 IntakeB-Zone1	OK	42 degrees C / 107 degrees F
SFB 4 Exhaust-Zone0	OK	51 degrees C / 123 degrees F
SFB 4 SFB-XF2-Zone1	OK	63 degrees C / 145 degrees F
SFB 4 SFB-XF1-Zone0	OK	66 degrees C / 150 degrees F
SFB 4 SFB-XF0-Zone0	OK	68 degrees C / 154 degrees F
SFB 5 Intake-Zone0	OK	55 degrees C / 131 degrees F
SFB 5 Exhaust-Zone1	OK	49 degrees C / 120 degrees F
SFB 5 IntakeA-Zone0	OK	51 degrees C / 123 degrees F
SFB 5 IntakeB-Zone1	OK	43 degrees C / 109 degrees F
SFB 5 Exhaust-Zone0	OK	51 degrees C / 123 degrees F
SFB 5 SFB-XF2-Zone1	OK	65 degrees C / 149 degrees F
SFB 5 SFB-XF1-Zone0	OK	66 degrees C / 150 degrees F
SFB 5 SFB-XF0-Zone0	OK	71 degrees C / 159 degrees F
SFB 6 Intake-Zone0	OK	55 degrees C / 131 degrees F
SFB 6 Exhaust-Zone1	OK	49 degrees C / 120 degrees F
SFB 6 IntakeA-Zone0	OK	51 degrees C / 123 degrees F
SFB 6 IntakeB-Zone1	OK	43 degrees C / 109 degrees F
SFB 6 Exhaust-Zone0	OK	51 degrees C / 123 degrees F
SFB 6 SFB-XF2-Zone1	OK	64 degrees C / 147 degrees F
SFB 6 SFB-XF1-Zone0	OK	66 degrees C / 150 degrees F
SFB 6 SFB-XF0-Zone0	OK	68 degrees C / 154 degrees F
SFB 7 Intake-Zone0	OK	55 degrees C / 131 degrees F
SFB 7 Exhaust-Zone1	OK	49 degrees C / 120 degrees F
SFB 7 IntakeA-Zone0	OK	51 degrees C / 123 degrees F
SFB 7 IntakeB-Zone1	OK	43 degrees C / 109 degrees F
SFB 7 Exhaust-Zone0	OK	52 degrees C / 125 degrees F
SFB 7 SFB-XF2-Zone1	OK	66 degrees C / 150 degrees F

SFB 7 SFB-XF1-Zone0	OK	67 degrees C / 152 degrees F
SFB 7 SFB-XF0-Zone0	OK	70 degrees C / 158 degrees F
FPC 0 Intake	OK	41 degrees C / 105 degrees F
FPC 0 Exhaust A	OK	48 degrees C / 118 degrees F
FPC 0 Exhaust B	OK	60 degrees C / 140 degrees F
FPC 0 LU 0 TSen	OK	56 degrees C / 132 degrees F
FPC 0 LU 0 Chip	OK	59 degrees C / 138 degrees F
FPC 0 LU 1 TSen	OK	56 degrees C / 132 degrees F
FPC 0 LU 1 Chip	OK	61 degrees C / 141 degrees F
FPC 0 LU 2 TSen	OK	56 degrees C / 132 degrees F
FPC 0 LU 2 Chip	OK	52 degrees C / 125 degrees F
FPC 0 LU 3 TSen	OK	56 degrees C / 132 degrees F
FPC 0 LU 3 Chip	OK	52 degrees C / 125 degrees F
FPC 0 MQ 0 TSen	OK	49 degrees C / 120 degrees F
FPC 0 MQ 0 Chip	OK	49 degrees C / 120 degrees F
FPC 0 MQ 1 TSen	OK	49 degrees C / 120 degrees F
FPC 0 MQ 1 Chip	OK	52 degrees C / 125 degrees F
FPC 0 MQ 2 TSen	OK	49 degrees C / 120 degrees F
FPC 0 MQ 2 Chip	OK	45 degrees C / 113 degrees F
FPC 0 MQ 3 TSen	OK	49 degrees C / 120 degrees F
FPC 0 MQ 3 Chip	OK	46 degrees C / 114 degrees F
FPC 1 Intake	OK	39 degrees C / 102 degrees F
FPC 1 Exhaust A	OK	48 degrees C / 118 degrees F
FPC 1 Exhaust B	OK	55 degrees C / 131 degrees F
FPC 1 LU 0 TSen	OK	52 degrees C / 125 degrees F
FPC 1 LU 0 Chip	OK	54 degrees C / 129 degrees F
FPC 1 LU 1 TSen	OK	52 degrees C / 125 degrees F
FPC 1 LU 1 Chip	OK	56 degrees C / 132 degrees F
FPC 1 LU 2 TSen	OK	52 degrees C / 125 degrees F
FPC 1 LU 2 Chip	OK	49 degrees C / 120 degrees F
FPC 1 LU 3 TSen	OK	52 degrees C / 125 degrees F
FPC 1 LU 3 Chip	OK	50 degrees C / 122 degrees F
FPC 1 MQ 0 TSen	OK	48 degrees C / 118 degrees F
FPC 1 MQ 0 Chip	OK	48 degrees C / 118 degrees F
FPC 1 MQ 1 TSen	OK	48 degrees C / 118 degrees F
FPC 1 MQ 1 Chip	OK	51 degrees C / 123 degrees F
FPC 1 MQ 2 TSen	OK	48 degrees C / 118 degrees F
FPC 1 MQ 2 Chip	OK	45 degrees C / 113 degrees F
FPC 1 MQ 3 TSen	OK	48 degrees C / 118 degrees F
FPC 1 MQ 3 Chip	OK	45 degrees C / 113 degrees F
FPC 2 Intake	OK	39 degrees C / 102 degrees F
FPC 2 Exhaust A	OK	48 degrees C / 118 degrees F
FPC 2 Exhaust B	OK	58 degrees C / 136 degrees F
FPC 2 LU 0 TSen	OK	55 degrees C / 131 degrees F
FPC 2 LU 0 Chip	OK	57 degrees C / 134 degrees F
FPC 2 LU 1 TSen	OK	55 degrees C / 131 degrees F
FPC 2 LU 1 Chip	OK	63 degrees C / 145 degrees F
FPC 2 LU 2 TSen	OK	55 degrees C / 131 degrees F
FPC 2 LU 2 Chip	OK	51 degrees C / 123 degrees F
FPC 2 LU 3 TSen	OK	55 degrees C / 131 degrees F
FPC 2 LU 3 Chip	OK	52 degrees C / 125 degrees F
FPC 2 MQ 0 TSen	OK	48 degrees C / 118 degrees F
FPC 2 MQ 0 Chip	OK	50 degrees C / 122 degrees F
FPC 2 MQ 1 TSen	OK	48 degrees C / 118 degrees F
FPC 2 MQ 1 Chip	OK	52 degrees C / 125 degrees F
FPC 2 MQ 2 TSen	OK	48 degrees C / 118 degrees F
FPC 2 MQ 2 Chip	OK	47 degrees C / 116 degrees F
FPC 2 MQ 3 TSen	OK	48 degrees C / 118 degrees F
FPC 2 MQ 3 Chip	OK	47 degrees C / 116 degrees F
FPC 3 Intake	OK	41 degrees C / 105 degrees F

FPC 3 Exhaust A	OK	48 degrees C / 118 degrees F
FPC 3 Exhaust B	OK	58 degrees C / 136 degrees F
FPC 3 LU 0 TSen	OK	56 degrees C / 132 degrees F
FPC 3 LU 0 Chip	OK	59 degrees C / 138 degrees F
FPC 3 LU 1 TSen	OK	56 degrees C / 132 degrees F
FPC 3 LU 1 Chip	OK	61 degrees C / 141 degrees F
FPC 3 LU 2 TSen	OK	56 degrees C / 132 degrees F
FPC 3 LU 2 Chip	OK	51 degrees C / 123 degrees F
FPC 3 LU 3 TSen	OK	56 degrees C / 132 degrees F
FPC 3 LU 3 Chip	OK	53 degrees C / 127 degrees F
FPC 3 MQ 0 TSen	OK	50 degrees C / 122 degrees F
FPC 3 MQ 0 Chip	OK	51 degrees C / 123 degrees F
FPC 3 MQ 1 TSen	OK	50 degrees C / 122 degrees F
FPC 3 MQ 1 Chip	OK	55 degrees C / 131 degrees F
FPC 3 MQ 2 TSen	OK	50 degrees C / 122 degrees F
FPC 3 MQ 2 Chip	OK	47 degrees C / 116 degrees F
FPC 3 MQ 3 TSen	OK	50 degrees C / 122 degrees F
FPC 3 MQ 3 Chip	OK	50 degrees C / 122 degrees F
FPC 4 Intake	OK	41 degrees C / 105 degrees F
FPC 4 Exhaust A	OK	48 degrees C / 118 degrees F
FPC 4 Exhaust B	OK	59 degrees C / 138 degrees F
FPC 4 LU 0 TSen	OK	56 degrees C / 132 degrees F
FPC 4 LU 0 Chip	OK	60 degrees C / 140 degrees F
FPC 4 LU 1 TSen	OK	56 degrees C / 132 degrees F
FPC 4 LU 1 Chip	OK	64 degrees C / 147 degrees F
FPC 4 LU 2 TSen	OK	56 degrees C / 132 degrees F
FPC 4 LU 2 Chip	OK	51 degrees C / 123 degrees F
FPC 4 LU 3 TSen	OK	56 degrees C / 132 degrees F
FPC 4 LU 3 Chip	OK	54 degrees C / 129 degrees F
FPC 4 MQ 0 TSen	OK	49 degrees C / 120 degrees F
FPC 4 MQ 0 Chip	OK	53 degrees C / 127 degrees F
FPC 4 MQ 1 TSen	OK	49 degrees C / 120 degrees F
FPC 4 MQ 1 Chip	OK	55 degrees C / 131 degrees F
FPC 4 MQ 2 TSen	OK	49 degrees C / 120 degrees F
FPC 4 MQ 2 Chip	OK	48 degrees C / 118 degrees F
FPC 4 MQ 3 TSen	OK	49 degrees C / 120 degrees F
FPC 4 MQ 3 Chip	OK	49 degrees C / 120 degrees F
FPC 5 Intake	OK	42 degrees C / 107 degrees F
FPC 5 Exhaust A	OK	49 degrees C / 120 degrees F
FPC 5 Exhaust B	OK	61 degrees C / 141 degrees F
FPC 5 LU 0 TSen	OK	58 degrees C / 136 degrees F
FPC 5 LU 0 Chip	OK	61 degrees C / 141 degrees F
FPC 5 LU 1 TSen	OK	58 degrees C / 136 degrees F
FPC 5 LU 1 Chip	OK	64 degrees C / 147 degrees F
FPC 5 LU 2 TSen	OK	58 degrees C / 136 degrees F
FPC 5 LU 2 Chip	OK	56 degrees C / 132 degrees F
FPC 5 LU 3 TSen	OK	58 degrees C / 136 degrees F
FPC 5 LU 3 Chip	OK	54 degrees C / 129 degrees F
FPC 5 MQ 0 TSen	OK	51 degrees C / 123 degrees F
FPC 5 MQ 0 Chip	OK	53 degrees C / 127 degrees F
FPC 5 MQ 1 TSen	OK	51 degrees C / 123 degrees F
FPC 5 MQ 1 Chip	OK	55 degrees C / 131 degrees F
FPC 5 MQ 2 TSen	OK	51 degrees C / 123 degrees F
FPC 5 MQ 2 Chip	OK	50 degrees C / 122 degrees F
FPC 5 MQ 3 TSen	OK	51 degrees C / 123 degrees F
FPC 5 MQ 3 Chip	OK	49 degrees C / 120 degrees F
FPC 6 Intake	OK	42 degrees C / 107 degrees F
FPC 6 Exhaust A	OK	50 degrees C / 122 degrees F
FPC 6 Exhaust B	OK	61 degrees C / 141 degrees F
FPC 6 LU 0 TSen	OK	58 degrees C / 136 degrees F

FPC 6 LU 0 Chip	OK	62 degrees C / 143 degrees F
FPC 6 LU 1 TSen	OK	58 degrees C / 136 degrees F
FPC 6 LU 1 Chip	OK	64 degrees C / 147 degrees F
FPC 6 LU 2 TSen	OK	58 degrees C / 136 degrees F
FPC 6 LU 2 Chip	OK	56 degrees C / 132 degrees F
FPC 6 LU 3 TSen	OK	58 degrees C / 136 degrees F
FPC 6 LU 3 Chip	OK	56 degrees C / 132 degrees F
FPC 6 MQ 0 TSen	OK	51 degrees C / 123 degrees F
FPC 6 MQ 0 Chip	OK	58 degrees C / 136 degrees F
FPC 6 MQ 1 TSen	OK	51 degrees C / 123 degrees F
FPC 6 MQ 1 Chip	OK	61 degrees C / 141 degrees F
FPC 6 MQ 2 TSen	OK	51 degrees C / 123 degrees F
FPC 6 MQ 2 Chip	OK	51 degrees C / 123 degrees F
FPC 6 MQ 3 TSen	OK	51 degrees C / 123 degrees F
FPC 6 MQ 3 Chip	OK	51 degrees C / 123 degrees F
FPC 7 Intake	OK	42 degrees C / 107 degrees F
FPC 7 Exhaust A	OK	50 degrees C / 122 degrees F
FPC 7 Exhaust B	OK	61 degrees C / 141 degrees F
FPC 7 LU 0 TSen	OK	58 degrees C / 136 degrees F
FPC 7 LU 0 Chip	OK	59 degrees C / 138 degrees F
FPC 7 LU 1 TSen	OK	58 degrees C / 136 degrees F
FPC 7 LU 1 Chip	OK	64 degrees C / 147 degrees F
FPC 7 LU 2 TSen	OK	58 degrees C / 136 degrees F
FPC 7 LU 2 Chip	OK	54 degrees C / 129 degrees F
FPC 7 LU 3 TSen	OK	58 degrees C / 136 degrees F
FPC 7 LU 3 Chip	OK	53 degrees C / 127 degrees F
FPC 7 MQ 0 TSen	OK	51 degrees C / 123 degrees F
FPC 7 MQ 0 Chip	OK	53 degrees C / 127 degrees F
FPC 7 MQ 1 TSen	OK	51 degrees C / 123 degrees F
FPC 7 MQ 1 Chip	OK	54 degrees C / 129 degrees F
FPC 7 MQ 2 TSen	OK	51 degrees C / 123 degrees F
FPC 7 MQ 2 Chip	OK	48 degrees C / 118 degrees F
FPC 7 MQ 3 TSen	OK	51 degrees C / 123 degrees F
FPC 7 MQ 3 Chip	OK	48 degrees C / 118 degrees F
FPC 8 Intake	OK	42 degrees C / 107 degrees F
FPC 8 Exhaust A	OK	50 degrees C / 122 degrees F
FPC 8 Exhaust B	OK	61 degrees C / 141 degrees F
FPC 8 LU 0 TSen	OK	58 degrees C / 136 degrees F
FPC 8 LU 0 Chip	OK	63 degrees C / 145 degrees F
FPC 8 LU 1 TSen	OK	58 degrees C / 136 degrees F
FPC 8 LU 1 Chip	OK	65 degrees C / 149 degrees F
FPC 8 LU 2 TSen	OK	58 degrees C / 136 degrees F
FPC 8 LU 2 Chip	OK	56 degrees C / 132 degrees F
FPC 8 LU 3 TSen	OK	58 degrees C / 136 degrees F
FPC 8 LU 3 Chip	OK	56 degrees C / 132 degrees F
FPC 8 MQ 0 TSen	OK	50 degrees C / 122 degrees F
FPC 8 MQ 0 Chip	OK	53 degrees C / 127 degrees F
FPC 8 MQ 1 TSen	OK	50 degrees C / 122 degrees F
FPC 8 MQ 1 Chip	OK	58 degrees C / 136 degrees F
FPC 8 MQ 2 TSen	OK	50 degrees C / 122 degrees F
FPC 8 MQ 2 Chip	OK	48 degrees C / 118 degrees F
FPC 8 MQ 3 TSen	OK	50 degrees C / 122 degrees F
FPC 8 MQ 3 Chip	OK	49 degrees C / 120 degrees F
FPC 9 Intake	OK	43 degrees C / 109 degrees F
FPC 9 Exhaust A	OK	51 degrees C / 123 degrees F
FPC 9 Exhaust B	OK	61 degrees C / 141 degrees F
FPC 9 LU 0 TSen	OK	58 degrees C / 136 degrees F
FPC 9 LU 0 Chip	OK	61 degrees C / 141 degrees F
FPC 9 LU 1 TSen	OK	58 degrees C / 136 degrees F
FPC 9 LU 1 Chip	OK	63 degrees C / 145 degrees F



FPC 9 LU 2 TSen	OK	58 degrees C / 136 degrees F
FPC 9 LU 2 Chip	OK	55 degrees C / 131 degrees F
FPC 9 LU 3 TSen	OK	58 degrees C / 136 degrees F
FPC 9 LU 3 Chip	OK	54 degrees C / 129 degrees F
FPC 9 MQ 0 TSen	OK	52 degrees C / 125 degrees F
FPC 9 MQ 0 Chip	OK	53 degrees C / 127 degrees F
FPC 9 MQ 1 TSen	OK	52 degrees C / 125 degrees F
FPC 9 MQ 1 Chip	OK	54 degrees C / 129 degrees F
FPC 9 MQ 2 TSen	OK	52 degrees C / 125 degrees F
FPC 9 MQ 2 Chip	OK	48 degrees C / 118 degrees F
FPC 9 MQ 3 TSen	OK	52 degrees C / 125 degrees F
FPC 9 MQ 3 Chip	OK	49 degrees C / 120 degrees F
FPC 10 Intake	OK	44 degrees C / 111 degrees F
FPC 10 Exhaust A	OK	48 degrees C / 118 degrees F
FPC 10 Exhaust B	OK	54 degrees C / 129 degrees F
FPC 10 LU 0 TSen	OK	53 degrees C / 127 degrees F
FPC 10 LU 0 Chip	OK	54 degrees C / 129 degrees F
FPC 10 LU 1 TSen	OK	53 degrees C / 127 degrees F
FPC 10 LU 1 Chip	OK	58 degrees C / 136 degrees F
FPC 10 LU 2 TSen	OK	53 degrees C / 127 degrees F
FPC 10 LU 2 Chip	OK	51 degrees C / 123 degrees F
FPC 10 LU 3 TSen	OK	53 degrees C / 127 degrees F
FPC 10 LU 3 Chip	OK	51 degrees C / 123 degrees F
FPC 10 MQ 0 TSen	OK	49 degrees C / 120 degrees F
FPC 10 MQ 0 Chip	OK	50 degrees C / 122 degrees F
FPC 10 MQ 1 TSen	OK	49 degrees C / 120 degrees F
FPC 10 MQ 1 Chip	OK	52 degrees C / 125 degrees F
FPC 10 MQ 2 TSen	OK	49 degrees C / 120 degrees F
FPC 10 MQ 2 Chip	OK	48 degrees C / 118 degrees F
FPC 10 MQ 3 TSen	OK	49 degrees C / 120 degrees F
FPC 10 MQ 3 Chip	OK	48 degrees C / 118 degrees F
FPC 11 Intake	OK	39 degrees C / 102 degrees F
FPC 11 Exhaust A	OK	47 degrees C / 116 degrees F
FPC 11 Exhaust B	OK	51 degrees C / 123 degrees F
FPC 11 LU 0 TSen	OK	50 degrees C / 122 degrees F
FPC 11 LU 0 Chip	OK	52 degrees C / 125 degrees F
FPC 11 LU 1 TSen	OK	50 degrees C / 122 degrees F
FPC 11 LU 1 Chip	OK	55 degrees C / 131 degrees F
FPC 11 LU 2 TSen	OK	50 degrees C / 122 degrees F
FPC 11 LU 2 Chip	OK	49 degrees C / 120 degrees F
FPC 11 LU 3 TSen	OK	50 degrees C / 122 degrees F
FPC 11 LU 3 Chip	OK	49 degrees C / 120 degrees F
FPC 11 MQ 0 TSen	OK	47 degrees C / 116 degrees F
FPC 11 MQ 0 Chip	OK	47 degrees C / 116 degrees F
FPC 11 MQ 1 TSen	OK	47 degrees C / 116 degrees F
FPC 11 MQ 1 Chip	OK	51 degrees C / 123 degrees F
FPC 11 MQ 2 TSen	OK	47 degrees C / 116 degrees F
FPC 11 MQ 2 Chip	OK	45 degrees C / 113 degrees F
FPC 11 MQ 3 TSen	OK	47 degrees C / 116 degrees F
FPC 11 MQ 3 Chip	OK	49 degrees C / 120 degrees F
FPC 12 Intake	OK	39 degrees C / 102 degrees F
FPC 12 Exhaust A	OK	47 degrees C / 116 degrees F
FPC 12 Exhaust B	OK	50 degrees C / 122 degrees F
FPC 12 LU 0 TSen	OK	49 degrees C / 120 degrees F
FPC 12 LU 0 Chip	OK	51 degrees C / 123 degrees F
FPC 12 LU 1 TSen	OK	49 degrees C / 120 degrees F
FPC 12 LU 1 Chip	OK	54 degrees C / 129 degrees F
FPC 12 LU 2 TSen	OK	49 degrees C / 120 degrees F
FPC 12 LU 2 Chip	OK	47 degrees C / 116 degrees F
FPC 12 LU 3 TSen	OK	49 degrees C / 120 degrees F

FPC 12 LU 3 Chip	OK	49 degrees C / 120 degrees F
FPC 12 MQ 0 TSen	OK	47 degrees C / 116 degrees F
FPC 12 MQ 0 Chip	OK	46 degrees C / 114 degrees F
FPC 12 MQ 1 TSen	OK	47 degrees C / 116 degrees F
FPC 12 MQ 1 Chip	OK	51 degrees C / 123 degrees F
FPC 12 MQ 2 TSen	OK	47 degrees C / 116 degrees F
FPC 12 MQ 2 Chip	OK	45 degrees C / 113 degrees F
FPC 12 MQ 3 TSen	OK	47 degrees C / 116 degrees F
FPC 12 MQ 3 Chip	OK	47 degrees C / 116 degrees F
FPC 13 Intake	OK	40 degrees C / 104 degrees F
FPC 13 Exhaust A	OK	48 degrees C / 118 degrees F
FPC 13 Exhaust B	OK	51 degrees C / 123 degrees F
FPC 13 LU 0 TSen	OK	50 degrees C / 122 degrees F
FPC 13 LU 0 Chip	OK	52 degrees C / 125 degrees F
FPC 13 LU 1 TSen	OK	50 degrees C / 122 degrees F
FPC 13 LU 1 Chip	OK	54 degrees C / 129 degrees F
FPC 13 LU 2 TSen	OK	50 degrees C / 122 degrees F
FPC 13 LU 2 Chip	OK	48 degrees C / 118 degrees F
FPC 13 LU 3 TSen	OK	50 degrees C / 122 degrees F
FPC 13 LU 3 Chip	OK	48 degrees C / 118 degrees F
FPC 13 MQ 0 TSen	OK	48 degrees C / 118 degrees F
FPC 13 MQ 0 Chip	OK	47 degrees C / 116 degrees F
FPC 13 MQ 1 TSen	OK	48 degrees C / 118 degrees F
FPC 13 MQ 1 Chip	OK	51 degrees C / 123 degrees F
FPC 13 MQ 2 TSen	OK	48 degrees C / 118 degrees F
FPC 13 MQ 2 Chip	OK	46 degrees C / 114 degrees F
FPC 13 MQ 3 TSen	OK	48 degrees C / 118 degrees F
FPC 13 MQ 3 Chip	OK	47 degrees C / 116 degrees F
FPC 14 Intake	OK	41 degrees C / 105 degrees F
FPC 14 Exhaust A	OK	49 degrees C / 120 degrees F
FPC 14 Exhaust B	OK	50 degrees C / 122 degrees F
FPC 14 LU 0 TSen	OK	49 degrees C / 120 degrees F
FPC 14 LU 0 Chip	OK	50 degrees C / 122 degrees F
FPC 14 LU 1 TSen	OK	49 degrees C / 120 degrees F
FPC 14 LU 1 Chip	OK	54 degrees C / 129 degrees F
FPC 14 LU 2 TSen	OK	49 degrees C / 120 degrees F
FPC 14 LU 2 Chip	OK	48 degrees C / 118 degrees F
FPC 14 LU 3 TSen	OK	49 degrees C / 120 degrees F
FPC 14 LU 3 Chip	OK	50 degrees C / 122 degrees F
FPC 14 MQ 0 TSen	OK	48 degrees C / 118 degrees F
FPC 14 MQ 0 Chip	OK	48 degrees C / 118 degrees F
FPC 14 MQ 1 TSen	OK	48 degrees C / 118 degrees F
FPC 14 MQ 1 Chip	OK	52 degrees C / 125 degrees F
FPC 14 MQ 2 TSen	OK	48 degrees C / 118 degrees F
FPC 14 MQ 2 Chip	OK	47 degrees C / 116 degrees F
FPC 14 MQ 3 TSen	OK	48 degrees C / 118 degrees F
FPC 14 MQ 3 Chip	OK	50 degrees C / 122 degrees F
FPC 15 Intake	OK	42 degrees C / 107 degrees F
FPC 15 Exhaust A	OK	51 degrees C / 123 degrees F
FPC 15 Exhaust B	OK	52 degrees C / 125 degrees F
FPC 15 LU 0 TSen	OK	52 degrees C / 125 degrees F
FPC 15 LU 0 Chip	OK	55 degrees C / 131 degrees F
FPC 15 LU 1 TSen	OK	52 degrees C / 125 degrees F
FPC 15 LU 1 Chip	OK	59 degrees C / 138 degrees F
FPC 15 LU 2 TSen	OK	52 degrees C / 125 degrees F
FPC 15 LU 2 Chip	OK	50 degrees C / 122 degrees F
FPC 15 LU 3 TSen	OK	52 degrees C / 125 degrees F
FPC 15 LU 3 Chip	OK	51 degrees C / 123 degrees F
FPC 15 MQ 0 TSen	OK	51 degrees C / 123 degrees F
FPC 15 MQ 0 Chip	OK	53 degrees C / 127 degrees F

FPC 15 MQ 1 TSen	OK	51 degrees C / 123 degrees F
FPC 15 MQ 1 Chip	OK	60 degrees C / 140 degrees F
FPC 15 MQ 2 TSen	OK	51 degrees C / 123 degrees F
FPC 15 MQ 2 Chip	OK	52 degrees C / 125 degrees F
FPC 15 MQ 3 TSen	OK	51 degrees C / 123 degrees F
FPC 15 MQ 3 Chip	OK	53 degrees C / 127 degrees F
FPC 16 Intake	OK	44 degrees C / 111 degrees F
FPC 16 Exhaust A	OK	51 degrees C / 123 degrees F
FPC 16 Exhaust B	OK	53 degrees C / 127 degrees F
FPC 16 LU 0 TSen	OK	51 degrees C / 123 degrees F
FPC 16 LU 0 Chip	OK	52 degrees C / 125 degrees F
FPC 16 LU 1 TSen	OK	51 degrees C / 123 degrees F
FPC 16 LU 1 Chip	OK	56 degrees C / 132 degrees F
FPC 16 LU 2 TSen	OK	51 degrees C / 123 degrees F
FPC 16 LU 2 Chip	OK	50 degrees C / 122 degrees F
FPC 16 LU 3 TSen	OK	51 degrees C / 123 degrees F
FPC 16 LU 3 Chip	OK	50 degrees C / 122 degrees F
FPC 16 MQ 0 TSen	OK	51 degrees C / 123 degrees F
FPC 16 MQ 0 Chip	OK	50 degrees C / 122 degrees F
FPC 16 MQ 1 TSen	OK	51 degrees C / 123 degrees F
FPC 16 MQ 1 Chip	OK	55 degrees C / 131 degrees F
FPC 16 MQ 2 TSen	OK	51 degrees C / 123 degrees F
FPC 16 MQ 2 Chip	OK	49 degrees C / 120 degrees F
FPC 16 MQ 3 TSen	OK	51 degrees C / 123 degrees F
FPC 16 MQ 3 Chip	OK	52 degrees C / 125 degrees F
FPC 17 Intake	OK	45 degrees C / 113 degrees F
FPC 17 Exhaust A	OK	52 degrees C / 125 degrees F
FPC 17 Exhaust B	OK	55 degrees C / 131 degrees F
FPC 17 LU 0 TSen	OK	54 degrees C / 129 degrees F
FPC 17 LU 0 Chip	OK	57 degrees C / 134 degrees F
FPC 17 LU 1 TSen	OK	54 degrees C / 129 degrees F
FPC 17 LU 1 Chip	OK	61 degrees C / 141 degrees F
FPC 17 LU 2 TSen	OK	54 degrees C / 129 degrees F
FPC 17 LU 2 Chip	OK	54 degrees C / 129 degrees F
FPC 17 LU 3 TSen	OK	54 degrees C / 129 degrees F
FPC 17 LU 3 Chip	OK	55 degrees C / 131 degrees F
FPC 17 MQ 0 TSen	OK	53 degrees C / 127 degrees F
FPC 17 MQ 0 Chip	OK	53 degrees C / 127 degrees F
FPC 17 MQ 1 TSen	OK	53 degrees C / 127 degrees F
FPC 17 MQ 1 Chip	OK	57 degrees C / 134 degrees F
FPC 17 MQ 2 TSen	OK	53 degrees C / 127 degrees F
FPC 17 MQ 2 Chip	OK	51 degrees C / 123 degrees F
FPC 17 MQ 3 TSen	OK	53 degrees C / 127 degrees F
FPC 17 MQ 3 Chip	OK	54 degrees C / 129 degrees F
FPC 18 Intake	OK	46 degrees C / 114 degrees F
FPC 18 Exhaust A	OK	53 degrees C / 127 degrees F
FPC 18 Exhaust B	OK	57 degrees C / 134 degrees F
FPC 18 LU 0 TSen	OK	56 degrees C / 132 degrees F
FPC 18 LU 0 Chip	OK	58 degrees C / 136 degrees F
FPC 18 LU 1 TSen	OK	56 degrees C / 132 degrees F
FPC 18 LU 1 Chip	OK	63 degrees C / 145 degrees F
FPC 18 LU 2 TSen	OK	56 degrees C / 132 degrees F
FPC 18 LU 2 Chip	OK	54 degrees C / 129 degrees F
FPC 18 LU 3 TSen	OK	56 degrees C / 132 degrees F
FPC 18 LU 3 Chip	OK	56 degrees C / 132 degrees F
FPC 18 MQ 0 TSen	OK	54 degrees C / 129 degrees F
FPC 18 MQ 0 Chip	OK	57 degrees C / 134 degrees F
FPC 18 MQ 1 TSen	OK	54 degrees C / 129 degrees F
FPC 18 MQ 1 Chip	OK	62 degrees C / 143 degrees F
FPC 18 MQ 2 TSen	OK	54 degrees C / 129 degrees F

FPC 18 MQ 2 Chip	OK	53 degrees C / 127 degrees F
FPC 18 MQ 3 TSen	OK	54 degrees C / 129 degrees F
FPC 18 MQ 3 Chip	OK	56 degrees C / 132 degrees F
FPC 19 Intake	OK	49 degrees C / 120 degrees F
FPC 19 Exhaust A	OK	56 degrees C / 132 degrees F
FPC 19 Exhaust B	OK	62 degrees C / 143 degrees F
FPC 19 LU 0 TSen	OK	62 degrees C / 143 degrees F
FPC 19 LU 0 Chip	OK	63 degrees C / 145 degrees F
FPC 19 LU 1 TSen	OK	62 degrees C / 143 degrees F
FPC 19 LU 1 Chip	OK	69 degrees C / 156 degrees F
FPC 19 LU 2 TSen	OK	62 degrees C / 143 degrees F
FPC 19 LU 2 Chip	OK	61 degrees C / 141 degrees F
FPC 19 LU 3 TSen	OK	62 degrees C / 143 degrees F
FPC 19 LU 3 Chip	OK	62 degrees C / 143 degrees F
FPC 19 MQ 0 TSen	OK	58 degrees C / 136 degrees F
FPC 19 MQ 0 Chip	OK	62 degrees C / 143 degrees F
FPC 19 MQ 1 TSen	OK	58 degrees C / 136 degrees F
FPC 19 MQ 1 Chip	OK	64 degrees C / 147 degrees F
FPC 19 MQ 2 TSen	OK	58 degrees C / 136 degrees F
FPC 19 MQ 2 Chip	OK	59 degrees C / 138 degrees F
FPC 19 MQ 3 TSen	OK	58 degrees C / 136 degrees F
FPC 19 MQ 3 Chip	OK	60 degrees C / 140 degrees F
ADC 0 Intake	OK	40 degrees C / 104 degrees F
ADC 0 Exhaust	OK	50 degrees C / 122 degrees F
ADC 0 ADC-XF1	OK	58 degrees C / 136 degrees F
ADC 0 ADC-XF0	OK	63 degrees C / 145 degrees F
ADC 1 Intake	OK	38 degrees C / 100 degrees F
ADC 1 Exhaust	OK	48 degrees C / 118 degrees F
ADC 1 ADC-XF1	OK	59 degrees C / 138 degrees F
ADC 1 ADC-XF0	OK	61 degrees C / 141 degrees F
ADC 2 Intake	OK	36 degrees C / 96 degrees F
ADC 2 Exhaust	OK	50 degrees C / 122 degrees F
ADC 2 ADC-XF1	OK	53 degrees C / 127 degrees F
ADC 2 ADC-XF0	OK	59 degrees C / 138 degrees F
ADC 3 Intake	OK	39 degrees C / 102 degrees F
ADC 3 Exhaust	OK	49 degrees C / 120 degrees F
ADC 3 ADC-XF1	OK	61 degrees C / 141 degrees F
ADC 3 ADC-XF0	OK	62 degrees C / 143 degrees F
ADC 4 Intake	OK	39 degrees C / 102 degrees F
ADC 4 Exhaust	OK	49 degrees C / 120 degrees F
ADC 4 ADC-XF1	OK	60 degrees C / 140 degrees F
ADC 4 ADC-XF0	OK	61 degrees C / 141 degrees F
ADC 5 Intake	OK	38 degrees C / 100 degrees F
ADC 5 Exhaust	OK	52 degrees C / 125 degrees F
ADC 5 ADC-XF1	OK	55 degrees C / 131 degrees F
ADC 5 ADC-XF0	OK	65 degrees C / 149 degrees F
ADC 6 Intake	OK	39 degrees C / 102 degrees F
ADC 6 Exhaust	OK	51 degrees C / 123 degrees F
ADC 6 ADC-XF1	OK	58 degrees C / 136 degrees F
ADC 6 ADC-XF0	OK	63 degrees C / 145 degrees F
ADC 7 Intake	OK	39 degrees C / 102 degrees F
ADC 7 Exhaust	OK	52 degrees C / 125 degrees F
ADC 7 ADC-XF1	OK	61 degrees C / 141 degrees F
ADC 7 ADC-XF0	OK	68 degrees C / 154 degrees F
ADC 8 Intake	OK	39 degrees C / 102 degrees F
ADC 8 Exhaust	OK	50 degrees C / 122 degrees F
ADC 8 ADC-XF1	OK	64 degrees C / 147 degrees F
ADC 8 ADC-XF0	OK	63 degrees C / 145 degrees F
ADC 9 Intake	OK	41 degrees C / 105 degrees F
ADC 9 Exhaust	OK	50 degrees C / 122 degrees F

ADC 9 ADC-XF1	OK	60 degrees C / 140 degrees F
ADC 9 ADC-XF0	OK	62 degrees C / 143 degrees F
ADC 10 Intake	OK	46 degrees C / 114 degrees F
ADC 10 Exhaust	OK	53 degrees C / 127 degrees F
ADC 10 ADC-XF1	OK	66 degrees C / 150 degrees F
ADC 10 ADC-XF0	OK	65 degrees C / 149 degrees F
ADC 11 Intake	OK	46 degrees C / 114 degrees F
ADC 11 Exhaust	OK	53 degrees C / 127 degrees F
ADC 11 ADC-XF1	OK	63 degrees C / 145 degrees F
ADC 11 ADC-XF0	OK	64 degrees C / 147 degrees F
ADC 12 Intake	OK	47 degrees C / 116 degrees F
ADC 12 Exhaust	OK	53 degrees C / 127 degrees F
ADC 12 ADC-XF1	OK	65 degrees C / 149 degrees F
ADC 12 ADC-XF0	OK	65 degrees C / 149 degrees F
ADC 13 Intake	OK	48 degrees C / 118 degrees F
ADC 13 Exhaust	OK	55 degrees C / 131 degrees F
ADC 13 ADC-XF1	OK	65 degrees C / 149 degrees F
ADC 13 ADC-XF0	OK	67 degrees C / 152 degrees F
ADC 14 Intake	OK	49 degrees C / 120 degrees F
ADC 14 Exhaust	OK	57 degrees C / 134 degrees F
ADC 14 ADC-XF1	OK	68 degrees C / 154 degrees F
ADC 14 ADC-XF0	OK	72 degrees C / 161 degrees F
ADC 15 Intake	OK	50 degrees C / 122 degrees F
ADC 15 Exhaust	OK	56 degrees C / 132 degrees F
ADC 15 ADC-XF1	OK	68 degrees C / 154 degrees F
ADC 15 ADC-XF0	OK	68 degrees C / 154 degrees F
ADC 16 Intake	OK	51 degrees C / 123 degrees F
ADC 16 Exhaust	OK	57 degrees C / 134 degrees F
ADC 16 ADC-XF1	OK	67 degrees C / 152 degrees F
ADC 16 ADC-XF0	OK	68 degrees C / 154 degrees F
ADC 17 Intake	OK	51 degrees C / 123 degrees F
ADC 17 Exhaust	OK	57 degrees C / 134 degrees F
ADC 17 ADC-XF1	OK	69 degrees C / 156 degrees F
ADC 17 ADC-XF0	OK	69 degrees C / 156 degrees F
ADC 18 Intake	OK	52 degrees C / 125 degrees F
ADC 18 Exhaust	OK	58 degrees C / 136 degrees F
ADC 18 ADC-XF1	OK	67 degrees C / 152 degrees F
ADC 18 ADC-XF0	OK	72 degrees C / 161 degrees F
ADC 19 Intake	OK	50 degrees C / 122 degrees F
ADC 19 Exhaust	OK	58 degrees C / 136 degrees F
ADC 19 ADC-XF1	OK	68 degrees C / 154 degrees F
ADC 19 ADC-XF0	OK	71 degrees C / 159 degrees F

### show chassis environment monitored (MX2008 Router)

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user@host> show chassis environment monitored
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Class	Item	Status	Measurement
Temp	CB 0 Inlet1	OK	37 degrees C / 98 degrees F
	CB 0 Inlet2	OK	46 degrees C / 114 degrees F
	CB 0 Inlet3	OK	44 degrees C / 111 degrees F
	CB 0 Inlet4	OK	42 degrees C / 107 degrees F
	CB 0 Exhaust1	OK	30 degrees C / 86 degrees F
	CB 0 Exhaust2	OK	40 degrees C / 104 degrees F
	CB 0 Exhaust3	OK	48 degrees C / 118 degrees F
	CB 0 Exhaust4	OK	46 degrees C / 114 degrees F
	CB 1 Inlet1	OK	30 degrees C / 86 degrees F
	CB 1 Inlet2	OK	31 degrees C / 87 degrees F
	CB 1 Inlet3	OK	29 degrees C / 84 degrees F
	CB 1 Inlet4	OK	32 degrees C / 89 degrees F

CB 1 Exhaust1	OK	30 degrees C / 86 degrees F
CB 1 Exhaust2	OK	33 degrees C / 91 degrees F
CB 1 Exhaust3	OK	34 degrees C / 93 degrees F
CB 1 Exhaust4	OK	35 degrees C / 95 degrees F
Routing Engine 0 CPU	OK	76 degrees C / 168 degrees F
Routing Engine 1 CPU	OK	47 degrees C / 116 degrees F
SFB 0 Inlet2	OK	44 degrees C / 111 degrees F
SFB 0 Exhaust1	OK	39 degrees C / 102 degrees F
SFB 0 Inlet1	OK	41 degrees C / 105 degrees F
SFB 0 Exhaust2	OK	45 degrees C / 113 degrees F
SFB 0 SFB2-PF-local	OK	45 degrees C / 113 degrees F
SFB 0 SFB2-PF-die	OK	51 degrees C / 123 degrees F
SFB 1 Inlet2	OK	30 degrees C / 86 degrees F
SFB 1 Exhaust1	OK	27 degrees C / 80 degrees F
SFB 1 Inlet1	OK	28 degrees C / 82 degrees F
SFB 1 Exhaust2	OK	31 degrees C / 87 degrees F
SFB 1 SFB2-PF-local	OK	30 degrees C / 86 degrees F
SFB 1 SFB2-PF-die	OK	37 degrees C / 98 degrees F
SFB 2 Inlet2	OK	28 degrees C / 82 degrees F
SFB 2 Exhaust1	OK	26 degrees C / 78 degrees F
SFB 2 Inlet1	OK	27 degrees C / 80 degrees F
SFB 2 Exhaust2	OK	28 degrees C / 82 degrees F
SFB 2 SFB2-PF-local	OK	27 degrees C / 80 degrees F
SFB 2 SFB2-PF-die	OK	33 degrees C / 91 degrees F
SFB 3 Inlet2	OK	28 degrees C / 82 degrees F
SFB 3 Exhaust1	OK	26 degrees C / 78 degrees F
SFB 3 Inlet1	OK	26 degrees C / 78 degrees F
SFB 3 Exhaust2	OK	28 degrees C / 82 degrees F
SFB 3 SFB2-PF-local	OK	27 degrees C / 80 degrees F
SFB 3 SFB2-PF-die	OK	33 degrees C / 91 degrees F
SFB 4 Inlet2	OK	28 degrees C / 82 degrees F
SFB 4 Exhaust1	OK	26 degrees C / 78 degrees F
SFB 4 Inlet1	OK	26 degrees C / 78 degrees F
SFB 4 Exhaust2	OK	28 degrees C / 82 degrees F
SFB 4 SFB2-PF-local	OK	27 degrees C / 80 degrees F
SFB 4 SFB2-PF-die	OK	32 degrees C / 89 degrees F
SFB 5 Inlet2	OK	29 degrees C / 84 degrees F
SFB 5 Exhaust1	OK	27 degrees C / 80 degrees F
SFB 5 Inlet1	OK	27 degrees C / 80 degrees F
SFB 5 Exhaust2	OK	29 degrees C / 84 degrees F
SFB 5 SFB2-PF-local	OK	28 degrees C / 82 degrees F
SFB 5 SFB2-PF-die	OK	34 degrees C / 93 degrees F
SFB 6 Inlet2	OK	34 degrees C / 93 degrees F
SFB 6 Exhaust1	OK	32 degrees C / 89 degrees F
SFB 6 Inlet1	OK	31 degrees C / 87 degrees F
SFB 6 Exhaust2	OK	34 degrees C / 93 degrees F
SFB 6 SFB2-PF-local	OK	34 degrees C / 93 degrees F
SFB 6 SFB2-PF-die	OK	40 degrees C / 104 degrees F
SFB 7 Inlet2	OK	29 degrees C / 84 degrees F
SFB 7 Exhaust1	OK	28 degrees C / 82 degrees F
SFB 7 Inlet1	OK	29 degrees C / 84 degrees F
SFB 7 Exhaust2	OK	29 degrees C / 84 degrees F
SFB 7 SFB2-PF-local	OK	28 degrees C / 82 degrees F
SFB 7 SFB2-PF-die	OK	33 degrees C / 91 degrees F
FPC 0 Intake	OK	29 degrees C / 84 degrees F
FPC 0 Exhaust A	OK	43 degrees C / 109 degrees F
FPC 0 Exhaust B	OK	42 degrees C / 107 degrees F
FPC 0 XL 0 TSen	OK	39 degrees C / 102 degrees F
FPC 0 XL 0 Chip	OK	53 degrees C / 127 degrees F
FPC 0 XL 0 XR2 0 TSen	OK	39 degrees C / 102 degrees F

FPC 0 XL 0 XR2 0 Chip	OK	60 degrees C / 140 degrees F
FPC 0 XL 0 XR2 1 TSen	OK	39 degrees C / 102 degrees F
FPC 0 XL 0 XR2 1 Chip	OK	60 degrees C / 140 degrees F
FPC 0 XL 1 TSen	OK	30 degrees C / 86 degrees F
FPC 0 XL 1 Chip	OK	43 degrees C / 109 degrees F
FPC 0 XL 1 XR2 0 TSen	OK	30 degrees C / 86 degrees F
FPC 0 XL 1 XR2 0 Chip	OK	50 degrees C / 122 degrees F
FPC 0 XL 1 XR2 1 TSen	OK	30 degrees C / 86 degrees F
FPC 0 XL 1 XR2 1 Chip	OK	51 degrees C / 123 degrees F
FPC 0 XM 0 TSen	OK	42 degrees C / 107 degrees F
FPC 0 XM 0 Chip	OK	50 degrees C / 122 degrees F
FPC 0 XM 1 TSen	OK	42 degrees C / 107 degrees F
FPC 0 XM 1 Chip	OK	42 degrees C / 107 degrees F
FPC 0 XM 2 TSen	OK	42 degrees C / 107 degrees F
FPC 0 XM 2 Chip	OK	42 degrees C / 107 degrees F
FPC 0 XM 3 TSen	OK	42 degrees C / 107 degrees F
FPC 0 XM 3 Chip	OK	40 degrees C / 104 degrees F
FPC 0 PCIe Switch TSen	OK	42 degrees C / 107 degrees F
FPC 0 PCIe Switch Chip	OK	22 degrees C / 71 degrees F
FPC 1 Intake	OK	29 degrees C / 84 degrees F
FPC 1 Exhaust A	OK	52 degrees C / 125 degrees F
FPC 1 Exhaust B	OK	44 degrees C / 111 degrees F
FPC 1 EA0 TSen	OK	55 degrees C / 131 degrees F
FPC 1 EA0 Chip	OK	48 degrees C / 118 degrees F
FPC 1 EA0_XR0 TSen	OK	55 degrees C / 131 degrees F
FPC 1 EA0_XR0 Chip	OK	57 degrees C / 134 degrees F
FPC 1 EA0_XR1 TSen	OK	55 degrees C / 131 degrees F
FPC 1 EA0_XR1 Chip	OK	54 degrees C / 129 degrees F
FPC 1 EA1 TSen	OK	55 degrees C / 131 degrees F
FPC 1 EA1 Chip	OK	51 degrees C / 123 degrees F
FPC 1 EA1_XR0 TSen	OK	55 degrees C / 131 degrees F
FPC 1 EA1_XR0 Chip	OK	58 degrees C / 136 degrees F
FPC 1 EA1_XR1 TSen	OK	55 degrees C / 131 degrees F
FPC 1 EA1_XR1 Chip	OK	59 degrees C / 138 degrees F
FPC 1 PEX TSen	OK	55 degrees C / 131 degrees F
FPC 1 PEX Chip	OK	39 degrees C / 102 degrees F
FPC 1 EA2 TSen	OK	43 degrees C / 109 degrees F
FPC 1 EA2 Chip	OK	39 degrees C / 102 degrees F
FPC 1 EA2_XR0 TSen	OK	43 degrees C / 109 degrees F
FPC 1 EA2_XR0 Chip	OK	46 degrees C / 114 degrees F
FPC 1 EA2_XR1 TSen	OK	43 degrees C / 109 degrees F
FPC 1 EA2_XR1 Chip	OK	43 degrees C / 109 degrees F
FPC 1 EA3 TSen	OK	43 degrees C / 109 degrees F
FPC 1 EA3 Chip	OK	40 degrees C / 104 degrees F
FPC 1 EA3_XR0 TSen	OK	43 degrees C / 109 degrees F
FPC 1 EA3_XR0 Chip	OK	51 degrees C / 123 degrees F
FPC 1 EA3_XR1 TSen	OK	43 degrees C / 109 degrees F
FPC 1 EA3_XR1 Chip	OK	47 degrees C / 116 degrees F
FPC 1 EA0_HMC0 Logic die	OK	61 degrees C / 141 degrees F
FPC 1 EA0_HMC0 DRAM botm	OK	58 degrees C / 136 degrees F
FPC 1 EA0_HMC1 Logic die	OK	62 degrees C / 143 degrees F
FPC 1 EA0_HMC1 DRAM botm	OK	59 degrees C / 138 degrees F
FPC 1 EA0_HMC2 Logic die	OK	59 degrees C / 138 degrees F
FPC 1 EA0_HMC2 DRAM botm	OK	56 degrees C / 132 degrees F
FPC 1 EA1_HMC0 Logic die	OK	66 degrees C / 150 degrees F
FPC 1 EA1_HMC0 DRAM botm	OK	63 degrees C / 145 degrees F
FPC 1 EA1_HMC1 Logic die	OK	65 degrees C / 149 degrees F
FPC 1 EA1_HMC1 DRAM botm	OK	62 degrees C / 143 degrees F
FPC 1 EA1_HMC2 Logic die	OK	63 degrees C / 145 degrees F
FPC 1 EA1_HMC2 DRAM botm	OK	60 degrees C / 140 degrees F

FPC 1 EA2_HMC0 Logic die	OK	51 degrees C / 123 degrees F
FPC 1 EA2_HMC0 DRAM botm	OK	48 degrees C / 118 degrees F
FPC 1 EA2_HMC1 Logic die	OK	55 degrees C / 131 degrees F
FPC 1 EA2_HMC1 DRAM botm	OK	52 degrees C / 125 degrees F
FPC 1 EA2_HMC2 Logic die	OK	52 degrees C / 125 degrees F
FPC 1 EA2_HMC2 DRAM botm	OK	49 degrees C / 120 degrees F
FPC 1 EA3_HMC0 Logic die	OK	51 degrees C / 123 degrees F
FPC 1 EA3_HMC0 DRAM botm	OK	48 degrees C / 118 degrees F
FPC 1 EA3_HMC1 Logic die	OK	51 degrees C / 123 degrees F
FPC 1 EA3_HMC1 DRAM botm	OK	48 degrees C / 118 degrees F
FPC 1 EA3_HMC2 Logic die	OK	52 degrees C / 125 degrees F
FPC 1 EA3_HMC2 DRAM botm	OK	49 degrees C / 120 degrees F
FPC 7 Intake	OK	31 degrees C / 87 degrees F
FPC 7 Exhaust A	OK	46 degrees C / 114 degrees F
FPC 7 Exhaust B	OK	38 degrees C / 100 degrees F
FPC 7 QX 0 TSen	OK	49 degrees C / 120 degrees F
FPC 7 QX 0 Chip	OK	52 degrees C / 125 degrees F
FPC 7 LU 0 TCAM TSen	OK	49 degrees C / 120 degrees F
FPC 7 LU 0 TCAM Chip	OK	52 degrees C / 125 degrees F
FPC 7 LU 0 TSen	OK	49 degrees C / 120 degrees F
FPC 7 LU 0 Chip	OK	51 degrees C / 123 degrees F
FPC 7 MQ 0 TSen	OK	49 degrees C / 120 degrees F
FPC 7 MQ 0 Chip	OK	55 degrees C / 131 degrees F
FPC 7 QX 1 TSen	OK	41 degrees C / 105 degrees F
FPC 7 QX 1 Chip	OK	42 degrees C / 107 degrees F
FPC 7 LU 1 TCAM TSen	OK	41 degrees C / 105 degrees F
FPC 7 LU 1 TCAM Chip	OK	43 degrees C / 109 degrees F
FPC 7 LU 1 TSen	OK	41 degrees C / 105 degrees F
FPC 7 LU 1 Chip	OK	46 degrees C / 114 degrees F
FPC 7 MQ 1 TSen	OK	41 degrees C / 105 degrees F
FPC 7 MQ 1 Chip	OK	47 degrees C / 116 degrees F
ADC 7 Intake	OK	32 degrees C / 89 degrees F
ADC 7 Exhaust	OK	39 degrees C / 102 degrees F
ADC 7 ADC-XF1	OK	46 degrees C / 114 degrees F
ADC 7 ADC-XF0	OK	54 degrees C / 129 degrees F

## show chassis environment monitored (MX10008 Router)

user@host&gt; show chassis environment monitored

Class	Item	Status	Measurement
Temp	Routing Engine 0 CPU		
	Routing Engine 1 CPU		
	CB 0 Intake A Temp Sensor	OK	24 degrees C / 75 degrees F
	CB 0 Intake B Temp Sensor	OK	24 degrees C / 75 degrees F
	CB 0 Exhaust A Temp Sensor	OK	28 degrees C / 82 degrees F
	CB 0 Exhaust B Temp Sensor	OK	30 degrees C / 86 degrees F
	CB 0 Middle Temp Sensor	OK	28 degrees C / 82 degrees F
	CB 1 Intake A Temp Sensor	OK	24 degrees C / 75 degrees F
	CB 1 Intake B Temp Sensor	OK	23 degrees C / 73 degrees F
	CB 1 Exhaust A Temp Sensor	OK	27 degrees C / 80 degrees F
	CB 1 Exhaust B Temp Sensor	OK	30 degrees C / 86 degrees F
	CB 1 Middle Temp Sensor	OK	28 degrees C / 82 degrees F
	FPC 0 Intake-A Temp Sensor	OK	32 degrees C / 89 degrees F
	FPC 0 Exhaust-A Temp Sensor	OK	44 degrees C / 111 degrees F
	FPC 0 Exhaust-B Temp Sensor	OK	49 degrees C / 120 degrees F
	FPC 0 EA0 Temp Sensor	OK	67 degrees C / 152 degrees F
	FPC 0 EA0_XR0 Temp Sensor	OK	69 degrees C / 156 degrees F
	FPC 0 EA0_XR1 Temp Sensor	OK	73 degrees C / 163 degrees F
	FPC 0 EA1 Temp Sensor	OK	61 degrees C / 141 degrees F



FPC 0 EA1_XR0 Temp Sensor	OK	65 degrees C / 149 degrees F
FPC 0 EA1_XR1 Temp Sensor	OK	63 degrees C / 145 degrees F
FPC 0 EA2 Temp Sensor	OK	69 degrees C / 156 degrees F
FPC 0 EA2_XR0 Temp Sensor	OK	73 degrees C / 163 degrees F
FPC 0 EA2_XR1 Temp Sensor	OK	72 degrees C / 161 degrees F
FPC 0 EA3 Temp Sensor	OK	64 degrees C / 147 degrees F
FPC 0 EA3_XR0 Temp Sensor	OK	66 degrees C / 150 degrees F
FPC 0 EA3_XR1 Temp Sensor	OK	65 degrees C / 149 degrees F
FPC 0 EA4 Temp Sensor	OK	71 degrees C / 159 degrees F
FPC 0 EA4_XR0 Temp Sensor	OK	72 degrees C / 161 degrees F
FPC 0 EA4_XR1 Temp Sensor	OK	71 degrees C / 159 degrees F
FPC 0 EA5 Temp Sensor	OK	58 degrees C / 136 degrees F
FPC 0 EA5_XR0 Temp Sensor	OK	62 degrees C / 143 degrees F
FPC 0 EA5_XR1 Temp Sensor	OK	63 degrees C / 145 degrees F
FPC 0 EA0_HMC0 Logic die	OK	75 degrees C / 167 degrees F
FPC 0 EA0_HMC0 DRAM botm	OK	72 degrees C / 161 degrees F
FPC 0 EA0_HMC1 Logic die	OK	76 degrees C / 168 degrees F
FPC 0 EA0_HMC1 DRAM botm	OK	73 degrees C / 163 degrees F
FPC 0 EA0_HMC2 Logic die	OK	77 degrees C / 170 degrees F
FPC 0 EA0_HMC2 DRAM botm	OK	74 degrees C / 165 degrees F
FPC 0 EA1_HMC0 Logic die	OK	73 degrees C / 163 degrees F
FPC 0 EA1_HMC0 DRAM botm	OK	70 degrees C / 158 degrees F
FPC 0 EA1_HMC1 Logic die	OK	73 degrees C / 163 degrees F
FPC 0 EA1_HMC1 DRAM botm	OK	70 degrees C / 158 degrees F
FPC 0 EA1_HMC2 Logic die	OK	72 degrees C / 161 degrees F
FPC 0 EA1_HMC2 DRAM botm	OK	69 degrees C / 156 degrees F
FPC 0 EA2_HMC0 Logic die	OK	80 degrees C / 176 degrees F
FPC 0 EA2_HMC0 DRAM botm	OK	77 degrees C / 170 degrees F
FPC 0 EA2_HMC1 Logic die	OK	81 degrees C / 177 degrees F
FPC 0 EA2_HMC1 DRAM botm	OK	78 degrees C / 172 degrees F
FPC 0 EA2_HMC2 Logic die	OK	80 degrees C / 176 degrees F
FPC 0 EA2_HMC2 DRAM botm	OK	77 degrees C / 170 degrees F
FPC 0 EA3_HMC0 Logic die	OK	77 degrees C / 170 degrees F
FPC 0 EA3_HMC0 DRAM botm	OK	74 degrees C / 165 degrees F
FPC 0 EA3_HMC1 Logic die	OK	78 degrees C / 172 degrees F
FPC 0 EA3_HMC1 DRAM botm	OK	75 degrees C / 167 degrees F
FPC 0 EA3_HMC2 Logic die	OK	77 degrees C / 170 degrees F
FPC 0 EA3_HMC2 DRAM botm	OK	74 degrees C / 165 degrees F
FPC 0 EA4_HMC0 Logic die	OK	80 degrees C / 176 degrees F
FPC 0 EA4_HMC0 DRAM botm	OK	77 degrees C / 170 degrees F
FPC 0 EA4_HMC1 Logic die	OK	81 degrees C / 177 degrees F
FPC 0 EA4_HMC1 DRAM botm	OK	78 degrees C / 172 degrees F
FPC 0 EA4_HMC2 Logic die	OK	80 degrees C / 176 degrees F
FPC 0 EA4_HMC2 DRAM botm	OK	77 degrees C / 170 degrees F
FPC 0 EA5_HMC0 Logic die	OK	69 degrees C / 156 degrees F
FPC 0 EA5_HMC0 DRAM botm	OK	66 degrees C / 150 degrees F
FPC 0 EA5_HMC1 Logic die	OK	68 degrees C / 154 degrees F
FPC 0 EA5_HMC1 DRAM botm	OK	65 degrees C / 149 degrees F
FPC 0 EA5_HMC2 Logic die	OK	68 degrees C / 154 degrees F
FPC 0 EA5_HMC2 DRAM botm	OK	65 degrees C / 149 degrees F
FPC 2 Intake-A Temp Sensor	OK	33 degrees C / 91 degrees F
FPC 2 Exhaust-A Temp Sensor	OK	52 degrees C / 125 degrees F
FPC 2 Exhaust-B Temp Sensor	OK	50 degrees C / 122 degrees F
FPC 2 EA0 Temp Sensor	OK	71 degrees C / 159 degrees F
FPC 2 EA0_XR0 Temp Sensor	OK	75 degrees C / 167 degrees F
FPC 2 EA0_XR1 Temp Sensor	OK	79 degrees C / 174 degrees F
FPC 2 EA1 Temp Sensor	OK	64 degrees C / 147 degrees F
FPC 2 EA1_XR0 Temp Sensor	OK	68 degrees C / 154 degrees F
FPC 2 EA1_XR1 Temp Sensor	OK	66 degrees C / 150 degrees F
FPC 2 EA2 Temp Sensor	OK	75 degrees C / 167 degrees F

FPC 2 EA2_XR0 Temp Sensor	OK	81 degrees C / 177 degrees F
FPC 2 EA2_XR1 Temp Sensor	OK	81 degrees C / 177 degrees F
FPC 2 EA3 Temp Sensor	OK	67 degrees C / 152 degrees F
FPC 2 EA3_XR0 Temp Sensor	OK	69 degrees C / 156 degrees F
FPC 2 EA3_XR1 Temp Sensor	OK	69 degrees C / 156 degrees F
FPC 2 EA4 Temp Sensor	OK	75 degrees C / 167 degrees F
FPC 2 EA4_XR0 Temp Sensor	OK	76 degrees C / 168 degrees F
FPC 2 EA4_XR1 Temp Sensor	OK	75 degrees C / 167 degrees F
FPC 2 EA5 Temp Sensor	OK	60 degrees C / 140 degrees F
FPC 2 EA5_XR0 Temp Sensor	OK	64 degrees C / 147 degrees F
FPC 2 EA5_XR1 Temp Sensor	OK	65 degrees C / 149 degrees F
FPC 2 EA0_HMC0 Logic die	OK	84 degrees C / 183 degrees F
FPC 2 EA0_HMC0 DRAM botm	OK	81 degrees C / 177 degrees F
FPC 2 EA0_HMC1 Logic die	OK	85 degrees C / 185 degrees F
FPC 2 EA0_HMC1 DRAM botm	OK	82 degrees C / 179 degrees F
FPC 2 EA0_HMC2 Logic die	OK	83 degrees C / 181 degrees F
FPC 2 EA0_HMC2 DRAM botm	OK	80 degrees C / 176 degrees F
FPC 2 EA1_HMC0 Logic die	OK	76 degrees C / 168 degrees F
FPC 2 EA1_HMC0 DRAM botm	OK	73 degrees C / 163 degrees F
FPC 2 EA1_HMC1 Logic die	OK	77 degrees C / 170 degrees F
FPC 2 EA1_HMC1 DRAM botm	OK	74 degrees C / 165 degrees F
FPC 2 EA1_HMC2 Logic die	OK	76 degrees C / 168 degrees F
FPC 2 EA1_HMC2 DRAM botm	OK	73 degrees C / 163 degrees F
FPC 2 EA2_HMC0 Logic die	OK	87 degrees C / 188 degrees F
FPC 2 EA2_HMC0 DRAM botm	OK	84 degrees C / 183 degrees F
FPC 2 EA2_HMC1 Logic die	OK	88 degrees C / 190 degrees F
FPC 2 EA2_HMC1 DRAM botm	OK	85 degrees C / 185 degrees F
FPC 2 EA2_HMC2 Logic die	OK	88 degrees C / 190 degrees F
FPC 2 EA2_HMC2 DRAM botm	OK	85 degrees C / 185 degrees F
FPC 2 EA3_HMC0 Logic die	OK	81 degrees C / 177 degrees F
FPC 2 EA3_HMC0 DRAM botm	OK	78 degrees C / 172 degrees F
FPC 2 EA3_HMC1 Logic die	OK	81 degrees C / 177 degrees F
FPC 2 EA3_HMC1 DRAM botm	OK	78 degrees C / 172 degrees F
FPC 2 EA3_HMC2 Logic die	OK	81 degrees C / 177 degrees F
FPC 2 EA3_HMC2 DRAM botm	OK	78 degrees C / 172 degrees F
FPC 2 EA4_HMC0 Logic die	OK	88 degrees C / 190 degrees F
FPC 2 EA4_HMC0 DRAM botm	OK	85 degrees C / 185 degrees F
FPC 2 EA4_HMC1 Logic die	OK	90 degrees C / 194 degrees F
FPC 2 EA4_HMC1 DRAM botm	OK	87 degrees C / 188 degrees F
FPC 2 EA4_HMC2 Logic die	OK	81 degrees C / 177 degrees F
FPC 2 EA4_HMC2 DRAM botm	OK	78 degrees C / 172 degrees F
FPC 2 EA5_HMC0 Logic die	OK	72 degrees C / 161 degrees F
FPC 2 EA5_HMC0 DRAM botm	OK	69 degrees C / 156 degrees F
FPC 2 EA5_HMC1 Logic die	OK	69 degrees C / 156 degrees F
FPC 2 EA5_HMC1 DRAM botm	OK	66 degrees C / 150 degrees F
FPC 2 EA5_HMC2 Logic die	OK	73 degrees C / 163 degrees F
FPC 2 EA5_HMC2 DRAM botm	OK	70 degrees C / 158 degrees F
FPC 3 Intake-A Temp Sensor	OK	30 degrees C / 86 degrees F
FPC 3 Exhaust-A Temp Sensor	OK	48 degrees C / 118 degrees F
FPC 3 Exhaust-B Temp Sensor	OK	45 degrees C / 113 degrees F
FPC 3 EA0 Temp Sensor	OK	60 degrees C / 140 degrees F
FPC 3 EA0_XR0 Temp Sensor	OK	65 degrees C / 149 degrees F
FPC 3 EA0_XR1 Temp Sensor	OK	67 degrees C / 152 degrees F
FPC 3 EA1 Temp Sensor	OK	54 degrees C / 129 degrees F
FPC 3 EA1_XR0 Temp Sensor	OK	60 degrees C / 140 degrees F
FPC 3 EA1_XR1 Temp Sensor	OK	59 degrees C / 138 degrees F
FPC 3 EA2 Temp Sensor	OK	62 degrees C / 143 degrees F
FPC 3 EA2_XR0 Temp Sensor	OK	67 degrees C / 152 degrees F
FPC 3 EA2_XR1 Temp Sensor	OK	67 degrees C / 152 degrees F
FPC 3 EA3 Temp Sensor	OK	55 degrees C / 131 degrees F

	FPC 3 EA3_XR0 Temp Sensor	OK	57 degrees C / 134 degrees F
	FPC 3 EA3_XR1 Temp Sensor	OK	57 degrees C / 134 degrees F
	FPC 3 EA4 Temp Sensor	OK	68 degrees C / 154 degrees F
	FPC 3 EA4_XR0 Temp Sensor	OK	71 degrees C / 159 degrees F
	FPC 3 EA4_XR1 Temp Sensor	OK	70 degrees C / 158 degrees F
	FPC 3 EA5 Temp Sensor	OK	55 degrees C / 131 degrees F
	FPC 3 EA5_XR0 Temp Sensor	OK	58 degrees C / 136 degrees F
	FPC 3 EA5_XR1 Temp Sensor	OK	59 degrees C / 138 degrees F
	FPC 3 EA0_HMC0 Logic die	OK	69 degrees C / 156 degrees F
	FPC 3 EA0_HMC0 DRAM botm	OK	66 degrees C / 150 degrees F
	FPC 3 EA0_HMC1 Logic die	OK	70 degrees C / 158 degrees F
	FPC 3 EA0_HMC1 DRAM botm	OK	67 degrees C / 152 degrees F
	FPC 3 EA0_HMC2 Logic die	OK	70 degrees C / 158 degrees F
	FPC 3 EA0_HMC2 DRAM botm	OK	67 degrees C / 152 degrees F
	FPC 3 EA1_HMC0 Logic die	OK	68 degrees C / 154 degrees F
	FPC 3 EA1_HMC0 DRAM botm	OK	65 degrees C / 149 degrees F
	FPC 3 EA1_HMC1 Logic die	OK	65 degrees C / 149 degrees F
	FPC 3 EA1_HMC1 DRAM botm	OK	62 degrees C / 143 degrees F
	FPC 3 EA1_HMC2 Logic die	OK	64 degrees C / 147 degrees F
	FPC 3 EA1_HMC2 DRAM botm	OK	61 degrees C / 141 degrees F
	FPC 3 EA2_HMC0 Logic die	OK	74 degrees C / 165 degrees F
	FPC 3 EA2_HMC0 DRAM botm	OK	71 degrees C / 159 degrees F
	FPC 3 EA2_HMC1 Logic die	OK	76 degrees C / 168 degrees F
	FPC 3 EA2_HMC1 DRAM botm	OK	73 degrees C / 163 degrees F
	FPC 3 EA2_HMC2 Logic die	OK	74 degrees C / 165 degrees F
	FPC 3 EA2_HMC2 DRAM botm	OK	71 degrees C / 159 degrees F
	FPC 3 EA3_HMC0 Logic die	OK	70 degrees C / 158 degrees F
	FPC 3 EA3_HMC0 DRAM botm	OK	67 degrees C / 152 degrees F
	FPC 3 EA3_HMC1 Logic die	OK	68 degrees C / 154 degrees F
	FPC 3 EA3_HMC1 DRAM botm	OK	65 degrees C / 149 degrees F
	FPC 3 EA3_HMC2 Logic die	OK	68 degrees C / 154 degrees F
	FPC 3 EA3_HMC2 DRAM botm	OK	65 degrees C / 149 degrees F
	FPC 3 EA4_HMC0 Logic die	OK	82 degrees C / 179 degrees F
	FPC 3 EA4_HMC0 DRAM botm	OK	79 degrees C / 174 degrees F
	FPC 3 EA4_HMC1 Logic die	OK	80 degrees C / 176 degrees F
	FPC 3 EA4_HMC1 DRAM botm	OK	77 degrees C / 170 degrees F
	FPC 3 EA4_HMC2 Logic die	OK	81 degrees C / 177 degrees F
	FPC 3 EA4_HMC2 DRAM botm	OK	78 degrees C / 172 degrees F
	FPC 3 EA5_HMC0 Logic die	OK	69 degrees C / 156 degrees F
	FPC 3 EA5_HMC0 DRAM botm	OK	66 degrees C / 150 degrees F
	FPC 3 EA5_HMC1 Logic die	OK	70 degrees C / 158 degrees F
	FPC 3 EA5_HMC1 DRAM botm	OK	67 degrees C / 152 degrees F
	FPC 3 EA5_HMC2 Logic die	OK	69 degrees C / 156 degrees F
	FPC 3 EA5_HMC2 DRAM botm	OK	66 degrees C / 150 degrees F
Power	PEM 0	OK	29 degrees C / 84 degrees F
	PEM 1	OK	27 degrees C / 80 degrees F
	PEM 2	OK	30 degrees C / 86 degrees F
	PEM 3	Check	
	PEM 4	Check	
	PEM 5	Check	
Fans	Fan Tray 0 Fan 0	OK	Spinning at normal speed
	Fan Tray 0 Fan 1	OK	Spinning at normal speed
	Fan Tray 0 Fan 2	OK	Spinning at normal speed
	Fan Tray 0 Fan 3	OK	Spinning at normal speed
	Fan Tray 0 Fan 4	Failed	
	Fan Tray 0 Fan 5	Failed	
	Fan Tray 0 Fan 6	OK	Spinning at normal speed
	Fan Tray 0 Fan 7	OK	Spinning at normal speed
	Fan Tray 0 Fan 8	OK	Spinning at normal speed
	Fan Tray 0 Fan 9	OK	Spinning at normal speed

Fan Tray 0 Fan 10	OK	Spinning at normal speed
Fan Tray 1 Fan 0	OK	Spinning at normal speed
Fan Tray 1 Fan 1	OK	Spinning at normal speed
Fan Tray 1 Fan 2	OK	Spinning at normal speed
Fan Tray 1 Fan 3	OK	Spinning at normal speed
Fan Tray 1 Fan 4	OK	Spinning at normal speed
Fan Tray 1 Fan 5	OK	Spinning at normal speed
Fan Tray 1 Fan 6	OK	Spinning at normal speed
Fan Tray 1 Fan 7	OK	Spinning at normal speed
Fan Tray 1 Fan 8	OK	Spinning at normal speed
Fan Tray 1 Fan 9	OK	Spinning at normal speed
Fan Tray 1 Fan 10	OK	Spinning at normal speed
SFB 0 Intake-A	OK	33 degrees C / 91 degrees F
SFB 0 Intake-B	OK	22 degrees C / 71 degrees F
SFB 0 Exhaust-A	OK	27 degrees C / 80 degrees F
SFB 0 Exhaust-B	OK	32 degrees C / 89 degrees F
SFB 0 PF0	OK	40 degrees C / 104 degrees F
SFB 0 PF1	OK	29 degrees C / 84 degrees F
SFB 1 Intake-A	OK	43 degrees C / 109 degrees F
SFB 1 Intake-B	OK	21 degrees C / 69 degrees F
SFB 1 Exhaust-A	OK	25 degrees C / 77 degrees F
SFB 1 Exhaust-B	OK	44 degrees C / 111 degrees F
SFB 1 PF0	OK	50 degrees C / 122 degrees F
SFB 1 PF1	OK	29 degrees C / 84 degrees F
SFB 2 Intake-A	OK	39 degrees C / 102 degrees F
SFB 2 Intake-B	OK	21 degrees C / 69 degrees F
SFB 2 Exhaust-A	OK	25 degrees C / 77 degrees F
SFB 2 Exhaust-B	OK	38 degrees C / 100 degrees F
SFB 2 PF0	OK	45 degrees C / 113 degrees F
SFB 2 PF1	OK	30 degrees C / 86 degrees F
SFB 3 Intake-A	OK	37 degrees C / 98 degrees F
SFB 3 Intake-B	OK	21 degrees C / 69 degrees F
SFB 3 Exhaust-A	OK	26 degrees C / 78 degrees F
SFB 3 Exhaust-B	OK	35 degrees C / 95 degrees F
SFB 3 PF0	OK	42 degrees C / 107 degrees F
SFB 3 PF1	OK	30 degrees C / 86 degrees F
SFB 4 Intake-A	OK	31 degrees C / 87 degrees F
SFB 4 Intake-B	OK	20 degrees C / 68 degrees F
SFB 4 Exhaust-A	OK	25 degrees C / 77 degrees F
SFB 4 Exhaust-B	OK	32 degrees C / 89 degrees F
SFB 4 PF0	OK	41 degrees C / 105 degrees F
SFB 4 PF1	OK	30 degrees C / 86 degrees F
SFB 5 Intake-A	OK	30 degrees C / 86 degrees F
SFB 5 Intake-B	OK	21 degrees C / 69 degrees F
SFB 5 Exhaust-A	OK	26 degrees C / 78 degrees F
SFB 5 Exhaust-B	OK	30 degrees C / 86 degrees F
SFB 5 PF0	OK	35 degrees C / 95 degrees F
SFB 5 PF1	OK	34 degrees C / 93 degrees F

## show chassis environment mcs

<b>Syntax</b>	<code>show chassis environment mcs</code> <code>&lt;slot&gt;</code>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	(M40e and M160 routers only) Display environmental information about the Miscellaneous Control Subsystems (MCSs).
<b>Options</b>	<p><b>none</b>—Display environmental information about both MCSs.</p> <p><b>slot</b> —(Optional) Display environmental information about an individual MCS. Replace <b>slot</b> with <b>0</b> or <b>1</b></p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><a href="#">request chassis mcs on page 870</a></li> </ul>
<b>List of Sample Output</b>	<p><a href="#">show chassis environment mcs (M40e Router) on page 1181</a></p> <p><a href="#">show chassis environment mcs (M160 Router) on page 1181</a></p>
<b>Output Fields</b>	Table 105 on page 1179 lists the output fields for the <b>show chassis environment mcs</b> command. Output fields are listed in the approximate order in which they appear.

*Table 105: show chassis environment mcs Output Fields*

Field Name	Field Description
<b>State</b>	<p>Status of the MCS:</p> <ul style="list-style-type: none"> <li><b>Present</b>—MCS is detected by the chassis daemon but is either not supported by the current version of Junos or MCS is coming up but not yet online.</li> <li><b>Online</b>—MCS is online and running.</li> <li><b>Offline</b>—MCS is powered down.</li> <li><b>Empty</b>—No MCS is present.</li> <li><b>Master</b>—MCS is online, operating as master.</li> <li><b>Standby</b>—MCS is online, operating as standby.</li> </ul>
<b>Temperature</b>	Temperature of the air flowing past the MCS.
<b>Power</b>	Information about the voltage supplied to the MCS. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
<b>BUS Revision</b>	Revision level of the generic bus device.

*Table 105: show chassis environment mcs Output Fields (continued)*

Field Name	Field Description
<b>FPGA Revision</b>	Revision level of the field-programmable gate array (FPGA) revision.

---

## Sample Output

### show chassis environment mcs (M40e Router)

```
user@host> show chassis environment mcs
```

```
MCS 0 status:
State                Online Master
Temperature           45 degrees C / 113 degrees F
Power:
  3.3 V               3283 mV
  5.0 V               5013 mV
  12.0 V              11721 mV
  5.0 V bias          5025 mV
  8.0 V bias          8229 mV
BUS Revision         12
FPGA Revision        13
MCS 1 status:
State                Online Standby
Temperature           42 degrees C / 107 degrees F
Power:
  3.3 V               3296 mV
  5.0 V               4971 mV
  12.0 V              11814 mV
  5.0 V bias          4976 mV
  8.0 V bias          8241 mV
BUS Revision         12
FPGA Revision        13
```

### show chassis environment mcs (M160 Router)

```
user@host> show chassis environment mcs
```

```
MCS 0 status:
State                Online Master
Temperature           50 degrees C / 122 degrees F
Power:
  3.3 V               3306 mV
  5.0 V               4993 mV
  12.0 V              11799 mV
  5.0 V bias          4993 mV
  8.0 V bias          8288 mV
BUS Revision         12
FPGA Revision        13
```

## show chassis environment monitored

<b>List of Syntax</b>	<a href="#">Syntax on page 1182</a> <a href="#">Syntax (MX2020, MX2010, and MX2008 Routers) on page 1182</a>
<b>Syntax</b>	show chassis environment monitored
<b>Syntax (MX2020, MX2010, and MX2008 Routers)</b>	show chassis environment monitored <all-members> <local> <member <i>member-id</i> >
<b>Release Information</b>	<p>Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Routers. Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms. Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms. <b>all-members</b>, <b>local</b>, and <b>member <i>member-id</i></b> options introduced in Junos OS Release 15.1 for MX2020 and MX2010 routers.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms. Command introduced in Junos OS Release 18.2 for MX10008 Universal Routing Platforms.</p>
<b>Description</b>	<p>(PTX Series Packet Transport Routers, MX2010, MX2020, MX2008, and MX10008 routers) Display status information for monitored temperatures.</p> <p>On the PTX Series Packet Transport Routers, and on MX2010, MX2020, MX2008, and MX10008 routers, you can configure which temperatures are monitored for computing temperature alarms. Use this command to display only the temperatures that are monitored. Temperatures that are not included in the temperature alarm computations are not displayed.</p>
<b>Options</b>	<p><b>none</b>—Display status information for monitored temperatures.</p> <p><b>all-members</b>—(MX2010, MX2020, and MX2008 routers only) (Optional) Display chassis information for monitored temperatures in all members of the Virtual Chassis configuration.</p> <p><b>local</b>—(MX2010, MX2020, and MX2008 routers only) (Optional) Display chassis information for monitored temperatures in the local member of the Virtual Chassis.</p> <p><b>member <i>member-id</i></b>—(MX2010, MX2020, and MX2008 routers only) (Optional) Display chassis information for monitored temperatures in the specified member of the Virtual Chassis. Replace <b><i>member-id</i></b> with the value 0 or 1.</p>
<b>Required Privilege Level</b>	view



- Related Documentation**
- [show chassis environment on page 969](#)
  - *Chassis-Level Feature Guide*

- List of Sample Output**
- [show chassis environment monitored \(PTX3000 Packet Transport Router\) on page 1183](#)
  - [show chassis environment monitored \(PTX5000 Packet Transport Router\) on page 1184](#)
  - [show chassis environment monitored \(MX2010 Router\) on page 1184](#)
  - [show chassis environment monitored \(MX2020 Router\) on page 1187](#)
  - [show chassis environment monitored \(MX2008 Router\) on page 1196](#)
  - [show chassis environment monitored \(MX10008 Router\) on page 1199](#)

**Output Fields** Table 104 on page 1158 lists the output fields for the **show chassis environment monitored** command. Output fields are listed in the approximate order in which they appear.

*Table 106: show chassis environment monitored Output Fields*

Field Name	Field Description
<b>Item</b>	Chassis component: <ul style="list-style-type: none"> <li>• (PTX Series Packet Transport Routers, and MX2010, MX2020, and Mx2008 routers)—Information about the chassis, Routing Engines, Control Boards (CBs), Switch Interface Boards (SIBs), PICs, and Flexible PIC Concentrators (FPCs).</li> </ul>
<b>Status</b>	Status of the specified item: <b>OK</b> , <b>Alarm</b> , or <b>Present</b> .
<b>Measurement</b>	Temperature of the air flowing past the specified chassis component. Temperature is displayed in degrees Celsius (C) and degrees Fahrenheit (F).

## Sample Output

### show chassis environment monitored (PTX3000 Packet Transport Router)

```
user@host> show chassis environment monitored
```

Class	Item	Status	Measurement
	Routing Engine 0 CPU	OK	54 degrees C / 129 degrees F
	Routing Engine 1 CPU	Present	
	CB 0 Exhaust A	OK	25 degrees C / 77 degrees F
	CB 1 Exhaust A	OK	22 degrees C / 71 degrees F
	SIB 0 Exhaust	OK	34 degrees C / 93 degrees F
	SIB 0 TF	OK	42 degrees C / 107 degrees F
	SIB 1 Exhaust	OK	31 degrees C / 87 degrees F
	SIB 1 TF	OK	41 degrees C / 105 degrees F
	SIB 2 Exhaust	OK	32 degrees C / 89 degrees F
	SIB 2 TF	OK	40 degrees C / 104 degrees F
	SIB 3 Exhaust	OK	32 degrees C / 89 degrees F
	SIB 3 TF	OK	40 degrees C / 104 degrees F
	SIB 4 Exhaust	OK	31 degrees C / 87 degrees F
	SIB 4 TF	OK	40 degrees C / 104 degrees F
	SIB 5 Exhaust	OK	31 degrees C / 87 degrees F
	SIB 5 TF	OK	39 degrees C / 102 degrees F
	SIB 6 Exhaust	OK	31 degrees C / 87 degrees F
	SIB 6 TF	OK	39 degrees C / 102 degrees F
	SIB 7 Exhaust	OK	35 degrees C / 95 degrees F

SIB 7 TF	OK	40 degrees C / 104 degrees F
SIB 8 Exhaust	OK	32 degrees C / 89 degrees F
SIB 8 TF	OK	40 degrees C / 104 degrees F
FPC 2 PMB CPU	OK	67 degrees C / 152 degrees F
FPC 2 Exhaust	OK	40 degrees C / 104 degrees F
FPC 2 Intake	OK	33 degrees C / 91 degrees F
FPC 2 TL0	OK	69 degrees C / 156 degrees F
FPC 2 TQ0	OK	60 degrees C / 140 degrees F
FPC 2 TL1	OK	56 degrees C / 132 degrees F
FPC 2 TQ1	OK	45 degrees C / 113 degrees F
PIC Ambient	OK	40 degrees C / 104 degrees F
FPC 6 PMB CPU	OK	80 degrees C / 176 degrees F
FPC 6 Exhaust	OK	53 degrees C / 127 degrees F
FPC 6 Intake	OK	36 degrees C / 96 degrees F
FPC 6 TL0	OK	69 degrees C / 156 degrees F
FPC 6 TQ0	OK	65 degrees C / 149 degrees F
FPC 6 TL1	OK	52 degrees C / 125 degrees F
FPC 6 TQ1	OK	47 degrees C / 116 degrees F
PIC Ambient	OK	46 degrees C / 114 degrees F
FPC 12 PMB CPU	OK	42 degrees C / 107 degrees F
FPC 12 Intake	OK	33 degrees C / 91 degrees F
FPC 12 Exhaust	OK	41 degrees C / 105 degrees F
FPC 12 TL0	OK	48 degrees C / 118 degrees F
FPC 12 TQ0	OK	45 degrees C / 113 degrees F
FPC 12 TL1	OK	58 degrees C / 136 degrees F
FPC 12 TQ1	OK	50 degrees C / 122 degrees F
PIC Ambient	OK	56 degrees C / 132 degrees F
PIC 100G_OTN_LH-12/0/0	OK	74 degrees C / 165 degrees F
PIC 100G_OTN_LH-12/0/1	OK	93 degrees C / 199 degrees F

### show chassis environment monitored (PTX5000 Packet Transport Router)

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user@host> show chassis environment monitored
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Class	Item	Status	Measurement
	Routing Engine 0 CPU	OK	71 degrees C / 159 degrees F
	Routing Engine 1 CPU	OK	62 degrees C / 143 degrees F
	CB 0 Exhaust A	OK	45 degrees C / 113 degrees F
	CB 0 Exhaust B	OK	41 degrees C / 105 degrees F
	CB 1 Exhaust A	OK	39 degrees C / 102 degrees F
	CB 1 Exhaust B	OK	36 degrees C / 96 degrees F

### show chassis environment monitored (MX2010 Router)

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user@host > show chassis environment monitored
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Class	Item	Status	Measurement
Temp	CB 0 IntakeA-Zone0	OK	37 degrees C / 98 degrees F
	CB 0 IntakeB-Zone1	OK	31 degrees C / 87 degrees F
	CB 0 IntakeC-Zone0	OK	39 degrees C / 102 degrees F
	CB 0 ExhaustA-Zone0	OK	36 degrees C / 96 degrees F
	CB 0 ExhaustB-Zone1	OK	32 degrees C / 89 degrees F
	CB 0 TCBC-Zone0	OK	34 degrees C / 93 degrees F
	CB 1 IntakeA-Zone0	OK	36 degrees C / 96 degrees F
	CB 1 IntakeB-Zone1	OK	28 degrees C / 82 degrees F
	CB 1 IntakeC-Zone0	OK	38 degrees C / 100 degrees F
	CB 1 ExhaustA-Zone0	OK	36 degrees C / 96 degrees F

CB 1 ExhaustB-Zone1	OK	30 degrees C / 86 degrees F
CB 1 TCBC-Zone0	OK	33 degrees C / 91 degrees F
SPMB 0 Intake	OK	30 degrees C / 86 degrees F
SPMB 1 Intake	OK	28 degrees C / 82 degrees F
Routing Engine 0 CPU	OK	32 degrees C / 89 degrees F
Routing Engine 1 CPU	Present	
SFB 0 Intake-Zone0	OK	46 degrees C / 114 degrees F
SFB 0 Exhaust-Zone1	OK	38 degrees C / 100 degrees F
SFB 0 IntakeA-Zone0	OK	35 degrees C / 95 degrees F
SFB 0 IntakeB-Zone1	OK	31 degrees C / 87 degrees F
SFB 0 Exhaust-Zone0	OK	39 degrees C / 102 degrees F
SFB 0 SFB-XF2-Zone1	OK	44 degrees C / 111 degrees F
SFB 0 SFB-XF1-Zone0	OK	47 degrees C / 116 degrees F
SFB 0 SFB-XF0-Zone0	OK	56 degrees C / 132 degrees F
SFB 1 Intake-Zone0	OK	34 degrees C / 93 degrees F
SFB 1 Exhaust-Zone1	OK	34 degrees C / 93 degrees F
SFB 1 IntakeA-Zone0	OK	29 degrees C / 84 degrees F
SFB 1 IntakeB-Zone1	OK	29 degrees C / 84 degrees F
SFB 1 Exhaust-Zone0	OK	32 degrees C / 89 degrees F
SFB 1 SFB-XF2-Zone1	OK	42 degrees C / 107 degrees F
SFB 1 SFB-XF1-Zone0	OK	40 degrees C / 104 degrees F
SFB 1 SFB-XF0-Zone0	OK	42 degrees C / 107 degrees F
SFB 2 Intake-Zone0	OK	33 degrees C / 91 degrees F
SFB 2 Exhaust-Zone1	OK	33 degrees C / 91 degrees F
SFB 2 IntakeA-Zone0	OK	28 degrees C / 82 degrees F
SFB 2 IntakeB-Zone1	OK	28 degrees C / 82 degrees F
SFB 2 Exhaust-Zone0	OK	31 degrees C / 87 degrees F
SFB 2 SFB-XF2-Zone1	OK	41 degrees C / 105 degrees F
SFB 2 SFB-XF1-Zone0	OK	39 degrees C / 102 degrees F
SFB 2 SFB-XF0-Zone0	OK	42 degrees C / 107 degrees F
SFB 3 Intake-Zone0	OK	33 degrees C / 91 degrees F
SFB 3 Exhaust-Zone1	OK	33 degrees C / 91 degrees F
SFB 3 IntakeA-Zone0	OK	29 degrees C / 84 degrees F
SFB 3 IntakeB-Zone1	OK	28 degrees C / 82 degrees F
SFB 3 Exhaust-Zone0	OK	31 degrees C / 87 degrees F
SFB 3 SFB-XF2-Zone1	OK	43 degrees C / 109 degrees F
SFB 3 SFB-XF1-Zone0	OK	40 degrees C / 104 degrees F
SFB 3 SFB-XF0-Zone0	OK	42 degrees C / 107 degrees F
SFB 4 Intake-Zone0	OK	34 degrees C / 93 degrees F
SFB 4 Exhaust-Zone1	OK	34 degrees C / 93 degrees F
SFB 4 IntakeA-Zone0	OK	29 degrees C / 84 degrees F
SFB 4 IntakeB-Zone1	OK	28 degrees C / 82 degrees F
SFB 4 Exhaust-Zone0	OK	32 degrees C / 89 degrees F
SFB 4 SFB-XF2-Zone1	OK	43 degrees C / 109 degrees F
SFB 4 SFB-XF1-Zone0	OK	42 degrees C / 107 degrees F
SFB 4 SFB-XF0-Zone0	OK	43 degrees C / 109 degrees F
SFB 5 Intake-Zone0	OK	34 degrees C / 93 degrees F
SFB 5 Exhaust-Zone1	OK	34 degrees C / 93 degrees F
SFB 5 IntakeA-Zone0	OK	30 degrees C / 86 degrees F
SFB 5 IntakeB-Zone1	OK	28 degrees C / 82 degrees F
SFB 5 Exhaust-Zone0	OK	32 degrees C / 89 degrees F
SFB 5 SFB-XF2-Zone1	OK	41 degrees C / 105 degrees F
SFB 5 SFB-XF1-Zone0	OK	41 degrees C / 105 degrees F
SFB 5 SFB-XF0-Zone0	OK	44 degrees C / 111 degrees F
SFB 6 Intake-Zone0	OK	35 degrees C / 95 degrees F
SFB 6 Exhaust-Zone1	OK	34 degrees C / 93 degrees F
SFB 6 IntakeA-Zone0	OK	30 degrees C / 86 degrees F
SFB 6 IntakeB-Zone1	OK	29 degrees C / 84 degrees F
SFB 6 Exhaust-Zone0	OK	33 degrees C / 91 degrees F
SFB 6 SFB-XF2-Zone1	OK	44 degrees C / 111 degrees F

SFB 6 SFB-XF1-Zone0	OK	43 degrees C / 109 degrees F
SFB 6 SFB-XF0-Zone0	OK	46 degrees C / 114 degrees F
SFB 7 Intake-Zone0	OK	39 degrees C / 102 degrees F
SFB 7 Exhaust-Zone1	OK	34 degrees C / 93 degrees F
SFB 7 IntakeA-Zone0	OK	34 degrees C / 93 degrees F
SFB 7 IntakeB-Zone1	OK	29 degrees C / 84 degrees F
SFB 7 Exhaust-Zone0	OK	37 degrees C / 98 degrees F
SFB 7 SFB-XF2-Zone1	OK	43 degrees C / 109 degrees F
SFB 7 SFB-XF1-Zone0	OK	47 degrees C / 116 degrees F
SFB 7 SFB-XF0-Zone0	OK	52 degrees C / 125 degrees F
FPC 0 Intake	OK	36 degrees C / 96 degrees F
FPC 0 Exhaust A	OK	42 degrees C / 107 degrees F
FPC 0 Exhaust B	OK	51 degrees C / 123 degrees F
FPC 0 LU 0 TSen	OK	49 degrees C / 120 degrees F
FPC 0 LU 0 Chip	OK	50 degrees C / 122 degrees F
FPC 0 LU 1 TSen	OK	49 degrees C / 120 degrees F
FPC 0 LU 1 Chip	OK	54 degrees C / 129 degrees F
FPC 0 LU 2 TSen	OK	49 degrees C / 120 degrees F
FPC 0 LU 2 Chip	OK	45 degrees C / 113 degrees F
FPC 0 LU 3 TSen	OK	49 degrees C / 120 degrees F
FPC 0 LU 3 Chip	OK	46 degrees C / 114 degrees F
FPC 0 MQ 0 TSen	OK	40 degrees C / 104 degrees F
FPC 0 MQ 0 Chip	OK	41 degrees C / 105 degrees F
FPC 0 MQ 1 TSen	OK	40 degrees C / 104 degrees F
FPC 0 MQ 1 Chip	OK	44 degrees C / 111 degrees F
FPC 0 MQ 2 TSen	OK	40 degrees C / 104 degrees F
FPC 0 MQ 2 Chip	OK	38 degrees C / 100 degrees F
FPC 0 MQ 3 TSen	OK	40 degrees C / 104 degrees F
FPC 0 MQ 3 Chip	OK	41 degrees C / 105 degrees F
FPC 1 Intake	OK	34 degrees C / 93 degrees F
FPC 1 Exhaust A	OK	46 degrees C / 114 degrees F
FPC 1 Exhaust B	OK	54 degrees C / 129 degrees F
FPC 1 LU 0 TSen	OK	45 degrees C / 113 degrees F
FPC 1 LU 0 Chip	OK	55 degrees C / 131 degrees F
FPC 1 LU 1 TSen	OK	45 degrees C / 113 degrees F
FPC 1 LU 1 Chip	OK	44 degrees C / 111 degrees F
FPC 1 LU 2 TSen	OK	45 degrees C / 113 degrees F
FPC 1 LU 2 Chip	OK	50 degrees C / 122 degrees F
FPC 1 LU 3 TSen	OK	45 degrees C / 113 degrees F
FPC 1 LU 3 Chip	OK	58 degrees C / 136 degrees F
FPC 1 XM 0 TSen	OK	45 degrees C / 113 degrees F
FPC 1 XM 0 Chip	OK	52 degrees C / 125 degrees F
FPC 1 XF 0 TSen	OK	45 degrees C / 113 degrees F
FPC 1 XF 0 Chip	OK	63 degrees C / 145 degrees F
FPC 1 PLX Switch TSen	OK	45 degrees C / 113 degrees F
FPC 1 PLX Switch Chip	OK	47 degrees C / 116 degrees F
FPC 8 Intake	OK	32 degrees C / 89 degrees F
FPC 8 Exhaust A	OK	44 degrees C / 111 degrees F
FPC 8 Exhaust B	OK	37 degrees C / 98 degrees F
FPC 8 LU 0 TCAM TSen	OK	41 degrees C / 105 degrees F
FPC 8 LU 0 TCAM Chip	OK	49 degrees C / 120 degrees F
FPC 8 LU 0 TSen	OK	41 degrees C / 105 degrees F
FPC 8 LU 0 Chip	OK	52 degrees C / 125 degrees F
FPC 8 MQ 0 TSen	OK	41 degrees C / 105 degrees F
FPC 8 MQ 0 Chip	OK	47 degrees C / 116 degrees F
FPC 8 LU 1 TCAM TSen	OK	39 degrees C / 102 degrees F
FPC 8 LU 1 TCAM Chip	OK	42 degrees C / 107 degrees F
FPC 8 LU 1 TSen	OK	39 degrees C / 102 degrees F
FPC 8 LU 1 Chip	OK	46 degrees C / 114 degrees F
FPC 8 MQ 1 TSen	OK	39 degrees C / 102 degrees F

FPC 8 MQ 1 Chip	OK	45 degrees C / 113 degrees F
FPC 9 Intake	OK	34 degrees C / 93 degrees F
FPC 9 Exhaust A	OK	41 degrees C / 105 degrees F
FPC 9 Exhaust B	OK	54 degrees C / 129 degrees F
FPC 9 LU 0 TSen	OK	51 degrees C / 123 degrees F
FPC 9 LU 0 Chip	OK	52 degrees C / 125 degrees F
FPC 9 LU 1 TSen	OK	51 degrees C / 123 degrees F
FPC 9 LU 1 Chip	OK	55 degrees C / 131 degrees F
FPC 9 LU 2 TSen	OK	51 degrees C / 123 degrees F
FPC 9 LU 2 Chip	OK	47 degrees C / 116 degrees F
FPC 9 LU 3 TSen	OK	51 degrees C / 123 degrees F
FPC 9 LU 3 Chip	OK	47 degrees C / 116 degrees F
FPC 9 MQ 0 TSen	OK	40 degrees C / 104 degrees F
FPC 9 MQ 0 Chip	OK	42 degrees C / 107 degrees F
FPC 9 MQ 1 TSen	OK	40 degrees C / 104 degrees F
FPC 9 MQ 1 Chip	OK	44 degrees C / 111 degrees F
FPC 9 MQ 2 TSen	OK	40 degrees C / 104 degrees F
FPC 9 MQ 2 Chip	OK	38 degrees C / 100 degrees F
FPC 9 MQ 3 TSen	OK	40 degrees C / 104 degrees F
FPC 9 MQ 3 Chip	OK	40 degrees C / 104 degrees F
ADC 0 Intake	OK	35 degrees C / 95 degrees F
ADC 0 Exhaust	OK	44 degrees C / 111 degrees F
ADC 0 ADC-XF1	OK	48 degrees C / 118 degrees F
ADC 0 ADC-XF0	OK	59 degrees C / 138 degrees F
ADC 1 Intake	OK	34 degrees C / 93 degrees F
ADC 1 Exhaust	OK	45 degrees C / 113 degrees F
ADC 1 ADC-XF1	OK	53 degrees C / 127 degrees F
ADC 1 ADC-XF0	OK	56 degrees C / 132 degrees F
ADC 8 Intake	OK	35 degrees C / 95 degrees F
ADC 8 Exhaust	OK	41 degrees C / 105 degrees F
ADC 8 ADC-XF1	OK	52 degrees C / 125 degrees F
ADC 8 ADC-XF0	OK	55 degrees C / 131 degrees F
ADC 9 Intake	OK	33 degrees C / 91 degrees F
ADC 9 Exhaust	OK	42 degrees C / 107 degrees F
ADC 9 ADC-XF1	OK	55 degrees C / 131 degrees F
ADC 9 ADC-XF0	OK	56 degrees C / 132 degrees F

### show chassis environment monitored (MX2020 Router)

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user@host > show chassis environment monitored
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Class	Item	Status	Measurement
Temp	CB 0 IntakeA-Zone0	OK	44 degrees C / 111 degrees F
	CB 0 IntakeB-Zone1	OK	34 degrees C / 93 degrees F
	CB 0 IntakeC-Zone0	OK	46 degrees C / 114 degrees F
	CB 0 ExhaustA-Zone0	OK	44 degrees C / 111 degrees F
	CB 0 ExhaustB-Zone1	OK	36 degrees C / 96 degrees F
	CB 0 TCBC-Zone0	OK	39 degrees C / 102 degrees F
	CB 1 IntakeA-Zone0	OK	46 degrees C / 114 degrees F
	CB 1 IntakeB-Zone1	OK	43 degrees C / 109 degrees F
	CB 1 IntakeC-Zone0	OK	47 degrees C / 116 degrees F
	CB 1 ExhaustA-Zone0	OK	45 degrees C / 113 degrees F
	CB 1 ExhaustB-Zone1	OK	42 degrees C / 107 degrees F
	CB 1 TCBC-Zone0	OK	46 degrees C / 114 degrees F
	SPMB 0 Intake	OK	33 degrees C / 91 degrees F
	SPMB 1 Intake	OK	43 degrees C / 109 degrees F
	Routing Engine 0 CPU	OK	34 degrees C / 93 degrees F
	Routing Engine 1 CPU	OK	42 degrees C / 107 degrees F
	SFB 0 Intake-Zone0	OK	52 degrees C / 125 degrees F
	SFB 0 Exhaust-Zone1	OK	45 degrees C / 113 degrees F

SFB 0 IntakeA-Zone0	OK	47 degrees C / 116 degrees F
SFB 0 IntakeB-Zone1	OK	38 degrees C / 100 degrees F
SFB 0 Exhaust-Zone0	OK	49 degrees C / 120 degrees F
SFB 0 SFB-XF2-Zone1	OK	59 degrees C / 138 degrees F
SFB 0 SFB-XF1-Zone0	OK	65 degrees C / 149 degrees F
SFB 0 SFB-XF0-Zone0	OK	65 degrees C / 149 degrees F
SFB 1 Intake-Zone0	OK	53 degrees C / 127 degrees F
SFB 1 Exhaust-Zone1	OK	45 degrees C / 113 degrees F
SFB 1 IntakeA-Zone0	OK	48 degrees C / 118 degrees F
SFB 1 IntakeB-Zone1	OK	39 degrees C / 102 degrees F
SFB 1 Exhaust-Zone0	OK	48 degrees C / 118 degrees F
SFB 1 SFB-XF2-Zone1	OK	60 degrees C / 140 degrees F
SFB 1 SFB-XF1-Zone0	OK	64 degrees C / 147 degrees F
SFB 1 SFB-XF0-Zone0	OK	66 degrees C / 150 degrees F
SFB 2 Intake-Zone0	OK	54 degrees C / 129 degrees F
SFB 2 Exhaust-Zone1	OK	46 degrees C / 114 degrees F
SFB 2 IntakeA-Zone0	OK	48 degrees C / 118 degrees F
SFB 2 IntakeB-Zone1	OK	39 degrees C / 102 degrees F
SFB 2 Exhaust-Zone0	OK	50 degrees C / 122 degrees F
SFB 2 SFB-XF2-Zone1	OK	63 degrees C / 145 degrees F
SFB 2 SFB-XF1-Zone0	OK	67 degrees C / 152 degrees F
SFB 2 SFB-XF0-Zone0	OK	67 degrees C / 152 degrees F
SFB 3 Intake-Zone0	OK	54 degrees C / 129 degrees F
SFB 3 Exhaust-Zone1	OK	46 degrees C / 114 degrees F
SFB 3 IntakeA-Zone0	OK	50 degrees C / 122 degrees F
SFB 3 IntakeB-Zone1	OK	40 degrees C / 104 degrees F
SFB 3 Exhaust-Zone0	OK	50 degrees C / 122 degrees F
SFB 3 SFB-XF2-Zone1	OK	64 degrees C / 147 degrees F
SFB 3 SFB-XF1-Zone0	OK	66 degrees C / 150 degrees F
SFB 3 SFB-XF0-Zone0	OK	68 degrees C / 154 degrees F
SFB 4 Intake-Zone0	OK	55 degrees C / 131 degrees F
SFB 4 Exhaust-Zone1	OK	48 degrees C / 118 degrees F
SFB 4 IntakeA-Zone0	OK	51 degrees C / 123 degrees F
SFB 4 IntakeB-Zone1	OK	42 degrees C / 107 degrees F
SFB 4 Exhaust-Zone0	OK	51 degrees C / 123 degrees F
SFB 4 SFB-XF2-Zone1	OK	63 degrees C / 145 degrees F
SFB 4 SFB-XF1-Zone0	OK	66 degrees C / 150 degrees F
SFB 4 SFB-XF0-Zone0	OK	68 degrees C / 154 degrees F
SFB 5 Intake-Zone0	OK	55 degrees C / 131 degrees F
SFB 5 Exhaust-Zone1	OK	49 degrees C / 120 degrees F
SFB 5 IntakeA-Zone0	OK	51 degrees C / 123 degrees F
SFB 5 IntakeB-Zone1	OK	43 degrees C / 109 degrees F
SFB 5 Exhaust-Zone0	OK	51 degrees C / 123 degrees F
SFB 5 SFB-XF2-Zone1	OK	65 degrees C / 149 degrees F
SFB 5 SFB-XF1-Zone0	OK	66 degrees C / 150 degrees F
SFB 5 SFB-XF0-Zone0	OK	71 degrees C / 159 degrees F
SFB 6 Intake-Zone0	OK	55 degrees C / 131 degrees F
SFB 6 Exhaust-Zone1	OK	49 degrees C / 120 degrees F
SFB 6 IntakeA-Zone0	OK	51 degrees C / 123 degrees F
SFB 6 IntakeB-Zone1	OK	43 degrees C / 109 degrees F
SFB 6 Exhaust-Zone0	OK	51 degrees C / 123 degrees F
SFB 6 SFB-XF2-Zone1	OK	64 degrees C / 147 degrees F
SFB 6 SFB-XF1-Zone0	OK	66 degrees C / 150 degrees F
SFB 6 SFB-XF0-Zone0	OK	68 degrees C / 154 degrees F
SFB 7 Intake-Zone0	OK	55 degrees C / 131 degrees F
SFB 7 Exhaust-Zone1	OK	49 degrees C / 120 degrees F
SFB 7 IntakeA-Zone0	OK	51 degrees C / 123 degrees F
SFB 7 IntakeB-Zone1	OK	43 degrees C / 109 degrees F
SFB 7 Exhaust-Zone0	OK	52 degrees C / 125 degrees F
SFB 7 SFB-XF2-Zone1	OK	66 degrees C / 150 degrees F

SFB 7 SFB-XF1-Zone0	OK	67 degrees C / 152 degrees F
SFB 7 SFB-XF0-Zone0	OK	70 degrees C / 158 degrees F
FPC 0 Intake	OK	41 degrees C / 105 degrees F
FPC 0 Exhaust A	OK	48 degrees C / 118 degrees F
FPC 0 Exhaust B	OK	60 degrees C / 140 degrees F
FPC 0 LU 0 TSen	OK	56 degrees C / 132 degrees F
FPC 0 LU 0 Chip	OK	59 degrees C / 138 degrees F
FPC 0 LU 1 TSen	OK	56 degrees C / 132 degrees F
FPC 0 LU 1 Chip	OK	61 degrees C / 141 degrees F
FPC 0 LU 2 TSen	OK	56 degrees C / 132 degrees F
FPC 0 LU 2 Chip	OK	52 degrees C / 125 degrees F
FPC 0 LU 3 TSen	OK	56 degrees C / 132 degrees F
FPC 0 LU 3 Chip	OK	52 degrees C / 125 degrees F
FPC 0 MQ 0 TSen	OK	49 degrees C / 120 degrees F
FPC 0 MQ 0 Chip	OK	49 degrees C / 120 degrees F
FPC 0 MQ 1 TSen	OK	49 degrees C / 120 degrees F
FPC 0 MQ 1 Chip	OK	52 degrees C / 125 degrees F
FPC 0 MQ 2 TSen	OK	49 degrees C / 120 degrees F
FPC 0 MQ 2 Chip	OK	45 degrees C / 113 degrees F
FPC 0 MQ 3 TSen	OK	49 degrees C / 120 degrees F
FPC 0 MQ 3 Chip	OK	46 degrees C / 114 degrees F
FPC 1 Intake	OK	39 degrees C / 102 degrees F
FPC 1 Exhaust A	OK	48 degrees C / 118 degrees F
FPC 1 Exhaust B	OK	55 degrees C / 131 degrees F
FPC 1 LU 0 TSen	OK	52 degrees C / 125 degrees F
FPC 1 LU 0 Chip	OK	54 degrees C / 129 degrees F
FPC 1 LU 1 TSen	OK	52 degrees C / 125 degrees F
FPC 1 LU 1 Chip	OK	56 degrees C / 132 degrees F
FPC 1 LU 2 TSen	OK	52 degrees C / 125 degrees F
FPC 1 LU 2 Chip	OK	49 degrees C / 120 degrees F
FPC 1 LU 3 TSen	OK	52 degrees C / 125 degrees F
FPC 1 LU 3 Chip	OK	50 degrees C / 122 degrees F
FPC 1 MQ 0 TSen	OK	48 degrees C / 118 degrees F
FPC 1 MQ 0 Chip	OK	48 degrees C / 118 degrees F
FPC 1 MQ 1 TSen	OK	48 degrees C / 118 degrees F
FPC 1 MQ 1 Chip	OK	51 degrees C / 123 degrees F
FPC 1 MQ 2 TSen	OK	48 degrees C / 118 degrees F
FPC 1 MQ 2 Chip	OK	45 degrees C / 113 degrees F
FPC 1 MQ 3 TSen	OK	48 degrees C / 118 degrees F
FPC 1 MQ 3 Chip	OK	45 degrees C / 113 degrees F
FPC 2 Intake	OK	39 degrees C / 102 degrees F
FPC 2 Exhaust A	OK	48 degrees C / 118 degrees F
FPC 2 Exhaust B	OK	58 degrees C / 136 degrees F
FPC 2 LU 0 TSen	OK	55 degrees C / 131 degrees F
FPC 2 LU 0 Chip	OK	57 degrees C / 134 degrees F
FPC 2 LU 1 TSen	OK	55 degrees C / 131 degrees F
FPC 2 LU 1 Chip	OK	63 degrees C / 145 degrees F
FPC 2 LU 2 TSen	OK	55 degrees C / 131 degrees F
FPC 2 LU 2 Chip	OK	51 degrees C / 123 degrees F
FPC 2 LU 3 TSen	OK	55 degrees C / 131 degrees F
FPC 2 LU 3 Chip	OK	52 degrees C / 125 degrees F
FPC 2 MQ 0 TSen	OK	48 degrees C / 118 degrees F
FPC 2 MQ 0 Chip	OK	50 degrees C / 122 degrees F
FPC 2 MQ 1 TSen	OK	48 degrees C / 118 degrees F
FPC 2 MQ 1 Chip	OK	52 degrees C / 125 degrees F
FPC 2 MQ 2 TSen	OK	48 degrees C / 118 degrees F
FPC 2 MQ 2 Chip	OK	47 degrees C / 116 degrees F
FPC 2 MQ 3 TSen	OK	48 degrees C / 118 degrees F
FPC 2 MQ 3 Chip	OK	47 degrees C / 116 degrees F
FPC 3 Intake	OK	41 degrees C / 105 degrees F

FPC 3 Exhaust A	OK	48 degrees C / 118 degrees F
FPC 3 Exhaust B	OK	58 degrees C / 136 degrees F
FPC 3 LU 0 TSen	OK	56 degrees C / 132 degrees F
FPC 3 LU 0 Chip	OK	59 degrees C / 138 degrees F
FPC 3 LU 1 TSen	OK	56 degrees C / 132 degrees F
FPC 3 LU 1 Chip	OK	61 degrees C / 141 degrees F
FPC 3 LU 2 TSen	OK	56 degrees C / 132 degrees F
FPC 3 LU 2 Chip	OK	51 degrees C / 123 degrees F
FPC 3 LU 3 TSen	OK	56 degrees C / 132 degrees F
FPC 3 LU 3 Chip	OK	53 degrees C / 127 degrees F
FPC 3 MQ 0 TSen	OK	50 degrees C / 122 degrees F
FPC 3 MQ 0 Chip	OK	51 degrees C / 123 degrees F
FPC 3 MQ 1 TSen	OK	50 degrees C / 122 degrees F
FPC 3 MQ 1 Chip	OK	55 degrees C / 131 degrees F
FPC 3 MQ 2 TSen	OK	50 degrees C / 122 degrees F
FPC 3 MQ 2 Chip	OK	47 degrees C / 116 degrees F
FPC 3 MQ 3 TSen	OK	50 degrees C / 122 degrees F
FPC 3 MQ 3 Chip	OK	50 degrees C / 122 degrees F
FPC 4 Intake	OK	41 degrees C / 105 degrees F
FPC 4 Exhaust A	OK	48 degrees C / 118 degrees F
FPC 4 Exhaust B	OK	59 degrees C / 138 degrees F
FPC 4 LU 0 TSen	OK	56 degrees C / 132 degrees F
FPC 4 LU 0 Chip	OK	60 degrees C / 140 degrees F
FPC 4 LU 1 TSen	OK	56 degrees C / 132 degrees F
FPC 4 LU 1 Chip	OK	64 degrees C / 147 degrees F
FPC 4 LU 2 TSen	OK	56 degrees C / 132 degrees F
FPC 4 LU 2 Chip	OK	51 degrees C / 123 degrees F
FPC 4 LU 3 TSen	OK	56 degrees C / 132 degrees F
FPC 4 LU 3 Chip	OK	54 degrees C / 129 degrees F
FPC 4 MQ 0 TSen	OK	49 degrees C / 120 degrees F
FPC 4 MQ 0 Chip	OK	53 degrees C / 127 degrees F
FPC 4 MQ 1 TSen	OK	49 degrees C / 120 degrees F
FPC 4 MQ 1 Chip	OK	55 degrees C / 131 degrees F
FPC 4 MQ 2 TSen	OK	49 degrees C / 120 degrees F
FPC 4 MQ 2 Chip	OK	48 degrees C / 118 degrees F
FPC 4 MQ 3 TSen	OK	49 degrees C / 120 degrees F
FPC 4 MQ 3 Chip	OK	49 degrees C / 120 degrees F
FPC 5 Intake	OK	42 degrees C / 107 degrees F
FPC 5 Exhaust A	OK	49 degrees C / 120 degrees F
FPC 5 Exhaust B	OK	61 degrees C / 141 degrees F
FPC 5 LU 0 TSen	OK	58 degrees C / 136 degrees F
FPC 5 LU 0 Chip	OK	61 degrees C / 141 degrees F
FPC 5 LU 1 TSen	OK	58 degrees C / 136 degrees F
FPC 5 LU 1 Chip	OK	64 degrees C / 147 degrees F
FPC 5 LU 2 TSen	OK	58 degrees C / 136 degrees F
FPC 5 LU 2 Chip	OK	56 degrees C / 132 degrees F
FPC 5 LU 3 TSen	OK	58 degrees C / 136 degrees F
FPC 5 LU 3 Chip	OK	54 degrees C / 129 degrees F
FPC 5 MQ 0 TSen	OK	51 degrees C / 123 degrees F
FPC 5 MQ 0 Chip	OK	53 degrees C / 127 degrees F
FPC 5 MQ 1 TSen	OK	51 degrees C / 123 degrees F
FPC 5 MQ 1 Chip	OK	55 degrees C / 131 degrees F
FPC 5 MQ 2 TSen	OK	51 degrees C / 123 degrees F
FPC 5 MQ 2 Chip	OK	50 degrees C / 122 degrees F
FPC 5 MQ 3 TSen	OK	51 degrees C / 123 degrees F
FPC 5 MQ 3 Chip	OK	49 degrees C / 120 degrees F
FPC 6 Intake	OK	42 degrees C / 107 degrees F
FPC 6 Exhaust A	OK	50 degrees C / 122 degrees F
FPC 6 Exhaust B	OK	61 degrees C / 141 degrees F
FPC 6 LU 0 TSen	OK	58 degrees C / 136 degrees F



FPC 6 LU 0 Chip	OK	62 degrees C / 143 degrees F
FPC 6 LU 1 TSen	OK	58 degrees C / 136 degrees F
FPC 6 LU 1 Chip	OK	64 degrees C / 147 degrees F
FPC 6 LU 2 TSen	OK	58 degrees C / 136 degrees F
FPC 6 LU 2 Chip	OK	56 degrees C / 132 degrees F
FPC 6 LU 3 TSen	OK	58 degrees C / 136 degrees F
FPC 6 LU 3 Chip	OK	56 degrees C / 132 degrees F
FPC 6 MQ 0 TSen	OK	51 degrees C / 123 degrees F
FPC 6 MQ 0 Chip	OK	58 degrees C / 136 degrees F
FPC 6 MQ 1 TSen	OK	51 degrees C / 123 degrees F
FPC 6 MQ 1 Chip	OK	61 degrees C / 141 degrees F
FPC 6 MQ 2 TSen	OK	51 degrees C / 123 degrees F
FPC 6 MQ 2 Chip	OK	51 degrees C / 123 degrees F
FPC 6 MQ 3 TSen	OK	51 degrees C / 123 degrees F
FPC 6 MQ 3 Chip	OK	51 degrees C / 123 degrees F
FPC 7 Intake	OK	42 degrees C / 107 degrees F
FPC 7 Exhaust A	OK	50 degrees C / 122 degrees F
FPC 7 Exhaust B	OK	61 degrees C / 141 degrees F
FPC 7 LU 0 TSen	OK	58 degrees C / 136 degrees F
FPC 7 LU 0 Chip	OK	59 degrees C / 138 degrees F
FPC 7 LU 1 TSen	OK	58 degrees C / 136 degrees F
FPC 7 LU 1 Chip	OK	64 degrees C / 147 degrees F
FPC 7 LU 2 TSen	OK	58 degrees C / 136 degrees F
FPC 7 LU 2 Chip	OK	54 degrees C / 129 degrees F
FPC 7 LU 3 TSen	OK	58 degrees C / 136 degrees F
FPC 7 LU 3 Chip	OK	53 degrees C / 127 degrees F
FPC 7 MQ 0 TSen	OK	51 degrees C / 123 degrees F
FPC 7 MQ 0 Chip	OK	53 degrees C / 127 degrees F
FPC 7 MQ 1 TSen	OK	51 degrees C / 123 degrees F
FPC 7 MQ 1 Chip	OK	54 degrees C / 129 degrees F
FPC 7 MQ 2 TSen	OK	51 degrees C / 123 degrees F
FPC 7 MQ 2 Chip	OK	48 degrees C / 118 degrees F
FPC 7 MQ 3 TSen	OK	51 degrees C / 123 degrees F
FPC 7 MQ 3 Chip	OK	48 degrees C / 118 degrees F
FPC 8 Intake	OK	42 degrees C / 107 degrees F
FPC 8 Exhaust A	OK	50 degrees C / 122 degrees F
FPC 8 Exhaust B	OK	61 degrees C / 141 degrees F
FPC 8 LU 0 TSen	OK	58 degrees C / 136 degrees F
FPC 8 LU 0 Chip	OK	63 degrees C / 145 degrees F
FPC 8 LU 1 TSen	OK	58 degrees C / 136 degrees F
FPC 8 LU 1 Chip	OK	65 degrees C / 149 degrees F
FPC 8 LU 2 TSen	OK	58 degrees C / 136 degrees F
FPC 8 LU 2 Chip	OK	56 degrees C / 132 degrees F
FPC 8 LU 3 TSen	OK	58 degrees C / 136 degrees F
FPC 8 LU 3 Chip	OK	56 degrees C / 132 degrees F
FPC 8 MQ 0 TSen	OK	50 degrees C / 122 degrees F
FPC 8 MQ 0 Chip	OK	53 degrees C / 127 degrees F
FPC 8 MQ 1 TSen	OK	50 degrees C / 122 degrees F
FPC 8 MQ 1 Chip	OK	58 degrees C / 136 degrees F
FPC 8 MQ 2 TSen	OK	50 degrees C / 122 degrees F
FPC 8 MQ 2 Chip	OK	48 degrees C / 118 degrees F
FPC 8 MQ 3 TSen	OK	50 degrees C / 122 degrees F
FPC 8 MQ 3 Chip	OK	49 degrees C / 120 degrees F
FPC 9 Intake	OK	43 degrees C / 109 degrees F
FPC 9 Exhaust A	OK	51 degrees C / 123 degrees F
FPC 9 Exhaust B	OK	61 degrees C / 141 degrees F
FPC 9 LU 0 TSen	OK	58 degrees C / 136 degrees F
FPC 9 LU 0 Chip	OK	61 degrees C / 141 degrees F
FPC 9 LU 1 TSen	OK	58 degrees C / 136 degrees F
FPC 9 LU 1 Chip	OK	63 degrees C / 145 degrees F

FPC 9 LU 2 TSen	OK	58 degrees C / 136 degrees F
FPC 9 LU 2 Chip	OK	55 degrees C / 131 degrees F
FPC 9 LU 3 TSen	OK	58 degrees C / 136 degrees F
FPC 9 LU 3 Chip	OK	54 degrees C / 129 degrees F
FPC 9 MQ 0 TSen	OK	52 degrees C / 125 degrees F
FPC 9 MQ 0 Chip	OK	53 degrees C / 127 degrees F
FPC 9 MQ 1 TSen	OK	52 degrees C / 125 degrees F
FPC 9 MQ 1 Chip	OK	54 degrees C / 129 degrees F
FPC 9 MQ 2 TSen	OK	52 degrees C / 125 degrees F
FPC 9 MQ 2 Chip	OK	48 degrees C / 118 degrees F
FPC 9 MQ 3 TSen	OK	52 degrees C / 125 degrees F
FPC 9 MQ 3 Chip	OK	49 degrees C / 120 degrees F
FPC 10 Intake	OK	44 degrees C / 111 degrees F
FPC 10 Exhaust A	OK	48 degrees C / 118 degrees F
FPC 10 Exhaust B	OK	54 degrees C / 129 degrees F
FPC 10 LU 0 TSen	OK	53 degrees C / 127 degrees F
FPC 10 LU 0 Chip	OK	54 degrees C / 129 degrees F
FPC 10 LU 1 TSen	OK	53 degrees C / 127 degrees F
FPC 10 LU 1 Chip	OK	58 degrees C / 136 degrees F
FPC 10 LU 2 TSen	OK	53 degrees C / 127 degrees F
FPC 10 LU 2 Chip	OK	51 degrees C / 123 degrees F
FPC 10 LU 3 TSen	OK	53 degrees C / 127 degrees F
FPC 10 LU 3 Chip	OK	51 degrees C / 123 degrees F
FPC 10 MQ 0 TSen	OK	49 degrees C / 120 degrees F
FPC 10 MQ 0 Chip	OK	50 degrees C / 122 degrees F
FPC 10 MQ 1 TSen	OK	49 degrees C / 120 degrees F
FPC 10 MQ 1 Chip	OK	52 degrees C / 125 degrees F
FPC 10 MQ 2 TSen	OK	49 degrees C / 120 degrees F
FPC 10 MQ 2 Chip	OK	48 degrees C / 118 degrees F
FPC 10 MQ 3 TSen	OK	49 degrees C / 120 degrees F
FPC 10 MQ 3 Chip	OK	48 degrees C / 118 degrees F
FPC 11 Intake	OK	39 degrees C / 102 degrees F
FPC 11 Exhaust A	OK	47 degrees C / 116 degrees F
FPC 11 Exhaust B	OK	51 degrees C / 123 degrees F
FPC 11 LU 0 TSen	OK	50 degrees C / 122 degrees F
FPC 11 LU 0 Chip	OK	52 degrees C / 125 degrees F
FPC 11 LU 1 TSen	OK	50 degrees C / 122 degrees F
FPC 11 LU 1 Chip	OK	55 degrees C / 131 degrees F
FPC 11 LU 2 TSen	OK	50 degrees C / 122 degrees F
FPC 11 LU 2 Chip	OK	49 degrees C / 120 degrees F
FPC 11 LU 3 TSen	OK	50 degrees C / 122 degrees F
FPC 11 LU 3 Chip	OK	49 degrees C / 120 degrees F
FPC 11 MQ 0 TSen	OK	47 degrees C / 116 degrees F
FPC 11 MQ 0 Chip	OK	47 degrees C / 116 degrees F
FPC 11 MQ 1 TSen	OK	47 degrees C / 116 degrees F
FPC 11 MQ 1 Chip	OK	51 degrees C / 123 degrees F
FPC 11 MQ 2 TSen	OK	47 degrees C / 116 degrees F
FPC 11 MQ 2 Chip	OK	45 degrees C / 113 degrees F
FPC 11 MQ 3 TSen	OK	47 degrees C / 116 degrees F
FPC 11 MQ 3 Chip	OK	49 degrees C / 120 degrees F
FPC 12 Intake	OK	39 degrees C / 102 degrees F
FPC 12 Exhaust A	OK	47 degrees C / 116 degrees F
FPC 12 Exhaust B	OK	50 degrees C / 122 degrees F
FPC 12 LU 0 TSen	OK	49 degrees C / 120 degrees F
FPC 12 LU 0 Chip	OK	51 degrees C / 123 degrees F
FPC 12 LU 1 TSen	OK	49 degrees C / 120 degrees F
FPC 12 LU 1 Chip	OK	54 degrees C / 129 degrees F
FPC 12 LU 2 TSen	OK	49 degrees C / 120 degrees F
FPC 12 LU 2 Chip	OK	47 degrees C / 116 degrees F
FPC 12 LU 3 TSen	OK	49 degrees C / 120 degrees F

FPC 12 LU 3 Chip	OK	49 degrees C / 120 degrees F
FPC 12 MQ 0 TSen	OK	47 degrees C / 116 degrees F
FPC 12 MQ 0 Chip	OK	46 degrees C / 114 degrees F
FPC 12 MQ 1 TSen	OK	47 degrees C / 116 degrees F
FPC 12 MQ 1 Chip	OK	51 degrees C / 123 degrees F
FPC 12 MQ 2 TSen	OK	47 degrees C / 116 degrees F
FPC 12 MQ 2 Chip	OK	45 degrees C / 113 degrees F
FPC 12 MQ 3 TSen	OK	47 degrees C / 116 degrees F
FPC 12 MQ 3 Chip	OK	47 degrees C / 116 degrees F
FPC 13 Intake	OK	40 degrees C / 104 degrees F
FPC 13 Exhaust A	OK	48 degrees C / 118 degrees F
FPC 13 Exhaust B	OK	51 degrees C / 123 degrees F
FPC 13 LU 0 TSen	OK	50 degrees C / 122 degrees F
FPC 13 LU 0 Chip	OK	52 degrees C / 125 degrees F
FPC 13 LU 1 TSen	OK	50 degrees C / 122 degrees F
FPC 13 LU 1 Chip	OK	54 degrees C / 129 degrees F
FPC 13 LU 2 TSen	OK	50 degrees C / 122 degrees F
FPC 13 LU 2 Chip	OK	48 degrees C / 118 degrees F
FPC 13 LU 3 TSen	OK	50 degrees C / 122 degrees F
FPC 13 LU 3 Chip	OK	48 degrees C / 118 degrees F
FPC 13 MQ 0 TSen	OK	48 degrees C / 118 degrees F
FPC 13 MQ 0 Chip	OK	47 degrees C / 116 degrees F
FPC 13 MQ 1 TSen	OK	48 degrees C / 118 degrees F
FPC 13 MQ 1 Chip	OK	51 degrees C / 123 degrees F
FPC 13 MQ 2 TSen	OK	48 degrees C / 118 degrees F
FPC 13 MQ 2 Chip	OK	46 degrees C / 114 degrees F
FPC 13 MQ 3 TSen	OK	48 degrees C / 118 degrees F
FPC 13 MQ 3 Chip	OK	47 degrees C / 116 degrees F
FPC 14 Intake	OK	41 degrees C / 105 degrees F
FPC 14 Exhaust A	OK	49 degrees C / 120 degrees F
FPC 14 Exhaust B	OK	50 degrees C / 122 degrees F
FPC 14 LU 0 TSen	OK	49 degrees C / 120 degrees F
FPC 14 LU 0 Chip	OK	50 degrees C / 122 degrees F
FPC 14 LU 1 TSen	OK	49 degrees C / 120 degrees F
FPC 14 LU 1 Chip	OK	54 degrees C / 129 degrees F
FPC 14 LU 2 TSen	OK	49 degrees C / 120 degrees F
FPC 14 LU 2 Chip	OK	48 degrees C / 118 degrees F
FPC 14 LU 3 TSen	OK	49 degrees C / 120 degrees F
FPC 14 LU 3 Chip	OK	50 degrees C / 122 degrees F
FPC 14 MQ 0 TSen	OK	48 degrees C / 118 degrees F
FPC 14 MQ 0 Chip	OK	48 degrees C / 118 degrees F
FPC 14 MQ 1 TSen	OK	48 degrees C / 118 degrees F
FPC 14 MQ 1 Chip	OK	52 degrees C / 125 degrees F
FPC 14 MQ 2 TSen	OK	48 degrees C / 118 degrees F
FPC 14 MQ 2 Chip	OK	47 degrees C / 116 degrees F
FPC 14 MQ 3 TSen	OK	48 degrees C / 118 degrees F
FPC 14 MQ 3 Chip	OK	50 degrees C / 122 degrees F
FPC 15 Intake	OK	42 degrees C / 107 degrees F
FPC 15 Exhaust A	OK	51 degrees C / 123 degrees F
FPC 15 Exhaust B	OK	52 degrees C / 125 degrees F
FPC 15 LU 0 TSen	OK	52 degrees C / 125 degrees F
FPC 15 LU 0 Chip	OK	55 degrees C / 131 degrees F
FPC 15 LU 1 TSen	OK	52 degrees C / 125 degrees F
FPC 15 LU 1 Chip	OK	59 degrees C / 138 degrees F
FPC 15 LU 2 TSen	OK	52 degrees C / 125 degrees F
FPC 15 LU 2 Chip	OK	50 degrees C / 122 degrees F
FPC 15 LU 3 TSen	OK	52 degrees C / 125 degrees F
FPC 15 LU 3 Chip	OK	51 degrees C / 123 degrees F
FPC 15 MQ 0 TSen	OK	51 degrees C / 123 degrees F
FPC 15 MQ 0 Chip	OK	53 degrees C / 127 degrees F

FPC 15 MQ 1 TSen	OK	51 degrees C / 123 degrees F
FPC 15 MQ 1 Chip	OK	60 degrees C / 140 degrees F
FPC 15 MQ 2 TSen	OK	51 degrees C / 123 degrees F
FPC 15 MQ 2 Chip	OK	52 degrees C / 125 degrees F
FPC 15 MQ 3 TSen	OK	51 degrees C / 123 degrees F
FPC 15 MQ 3 Chip	OK	53 degrees C / 127 degrees F
FPC 16 Intake	OK	44 degrees C / 111 degrees F
FPC 16 Exhaust A	OK	51 degrees C / 123 degrees F
FPC 16 Exhaust B	OK	53 degrees C / 127 degrees F
FPC 16 LU 0 TSen	OK	51 degrees C / 123 degrees F
FPC 16 LU 0 Chip	OK	52 degrees C / 125 degrees F
FPC 16 LU 1 TSen	OK	51 degrees C / 123 degrees F
FPC 16 LU 1 Chip	OK	56 degrees C / 132 degrees F
FPC 16 LU 2 TSen	OK	51 degrees C / 123 degrees F
FPC 16 LU 2 Chip	OK	50 degrees C / 122 degrees F
FPC 16 LU 3 TSen	OK	51 degrees C / 123 degrees F
FPC 16 LU 3 Chip	OK	50 degrees C / 122 degrees F
FPC 16 MQ 0 TSen	OK	51 degrees C / 123 degrees F
FPC 16 MQ 0 Chip	OK	50 degrees C / 122 degrees F
FPC 16 MQ 1 TSen	OK	51 degrees C / 123 degrees F
FPC 16 MQ 1 Chip	OK	55 degrees C / 131 degrees F
FPC 16 MQ 2 TSen	OK	51 degrees C / 123 degrees F
FPC 16 MQ 2 Chip	OK	49 degrees C / 120 degrees F
FPC 16 MQ 3 TSen	OK	51 degrees C / 123 degrees F
FPC 16 MQ 3 Chip	OK	52 degrees C / 125 degrees F
FPC 17 Intake	OK	45 degrees C / 113 degrees F
FPC 17 Exhaust A	OK	52 degrees C / 125 degrees F
FPC 17 Exhaust B	OK	55 degrees C / 131 degrees F
FPC 17 LU 0 TSen	OK	54 degrees C / 129 degrees F
FPC 17 LU 0 Chip	OK	57 degrees C / 134 degrees F
FPC 17 LU 1 TSen	OK	54 degrees C / 129 degrees F
FPC 17 LU 1 Chip	OK	61 degrees C / 141 degrees F
FPC 17 LU 2 TSen	OK	54 degrees C / 129 degrees F
FPC 17 LU 2 Chip	OK	54 degrees C / 129 degrees F
FPC 17 LU 3 TSen	OK	54 degrees C / 129 degrees F
FPC 17 LU 3 Chip	OK	55 degrees C / 131 degrees F
FPC 17 MQ 0 TSen	OK	53 degrees C / 127 degrees F
FPC 17 MQ 0 Chip	OK	53 degrees C / 127 degrees F
FPC 17 MQ 1 TSen	OK	53 degrees C / 127 degrees F
FPC 17 MQ 1 Chip	OK	57 degrees C / 134 degrees F
FPC 17 MQ 2 TSen	OK	53 degrees C / 127 degrees F
FPC 17 MQ 2 Chip	OK	51 degrees C / 123 degrees F
FPC 17 MQ 3 TSen	OK	53 degrees C / 127 degrees F
FPC 17 MQ 3 Chip	OK	54 degrees C / 129 degrees F
FPC 18 Intake	OK	46 degrees C / 114 degrees F
FPC 18 Exhaust A	OK	53 degrees C / 127 degrees F
FPC 18 Exhaust B	OK	57 degrees C / 134 degrees F
FPC 18 LU 0 TSen	OK	56 degrees C / 132 degrees F
FPC 18 LU 0 Chip	OK	58 degrees C / 136 degrees F
FPC 18 LU 1 TSen	OK	56 degrees C / 132 degrees F
FPC 18 LU 1 Chip	OK	63 degrees C / 145 degrees F
FPC 18 LU 2 TSen	OK	56 degrees C / 132 degrees F
FPC 18 LU 2 Chip	OK	54 degrees C / 129 degrees F
FPC 18 LU 3 TSen	OK	56 degrees C / 132 degrees F
FPC 18 LU 3 Chip	OK	56 degrees C / 132 degrees F
FPC 18 MQ 0 TSen	OK	54 degrees C / 129 degrees F
FPC 18 MQ 0 Chip	OK	57 degrees C / 134 degrees F
FPC 18 MQ 1 TSen	OK	54 degrees C / 129 degrees F
FPC 18 MQ 1 Chip	OK	62 degrees C / 143 degrees F
FPC 18 MQ 2 TSen	OK	54 degrees C / 129 degrees F

FPC 18 MQ 2 Chip	OK	53 degrees C / 127 degrees F
FPC 18 MQ 3 TSen	OK	54 degrees C / 129 degrees F
FPC 18 MQ 3 Chip	OK	56 degrees C / 132 degrees F
FPC 19 Intake	OK	49 degrees C / 120 degrees F
FPC 19 Exhaust A	OK	56 degrees C / 132 degrees F
FPC 19 Exhaust B	OK	62 degrees C / 143 degrees F
FPC 19 LU 0 TSen	OK	62 degrees C / 143 degrees F
FPC 19 LU 0 Chip	OK	63 degrees C / 145 degrees F
FPC 19 LU 1 TSen	OK	62 degrees C / 143 degrees F
FPC 19 LU 1 Chip	OK	69 degrees C / 156 degrees F
FPC 19 LU 2 TSen	OK	62 degrees C / 143 degrees F
FPC 19 LU 2 Chip	OK	61 degrees C / 141 degrees F
FPC 19 LU 3 TSen	OK	62 degrees C / 143 degrees F
FPC 19 LU 3 Chip	OK	62 degrees C / 143 degrees F
FPC 19 MQ 0 TSen	OK	58 degrees C / 136 degrees F
FPC 19 MQ 0 Chip	OK	62 degrees C / 143 degrees F
FPC 19 MQ 1 TSen	OK	58 degrees C / 136 degrees F
FPC 19 MQ 1 Chip	OK	64 degrees C / 147 degrees F
FPC 19 MQ 2 TSen	OK	58 degrees C / 136 degrees F
FPC 19 MQ 2 Chip	OK	59 degrees C / 138 degrees F
FPC 19 MQ 3 TSen	OK	58 degrees C / 136 degrees F
FPC 19 MQ 3 Chip	OK	60 degrees C / 140 degrees F
ADC 0 Intake	OK	40 degrees C / 104 degrees F
ADC 0 Exhaust	OK	50 degrees C / 122 degrees F
ADC 0 ADC-XF1	OK	58 degrees C / 136 degrees F
ADC 0 ADC-XF0	OK	63 degrees C / 145 degrees F
ADC 1 Intake	OK	38 degrees C / 100 degrees F
ADC 1 Exhaust	OK	48 degrees C / 118 degrees F
ADC 1 ADC-XF1	OK	59 degrees C / 138 degrees F
ADC 1 ADC-XF0	OK	61 degrees C / 141 degrees F
ADC 2 Intake	OK	36 degrees C / 96 degrees F
ADC 2 Exhaust	OK	50 degrees C / 122 degrees F
ADC 2 ADC-XF1	OK	53 degrees C / 127 degrees F
ADC 2 ADC-XF0	OK	59 degrees C / 138 degrees F
ADC 3 Intake	OK	39 degrees C / 102 degrees F
ADC 3 Exhaust	OK	49 degrees C / 120 degrees F
ADC 3 ADC-XF1	OK	61 degrees C / 141 degrees F
ADC 3 ADC-XF0	OK	62 degrees C / 143 degrees F
ADC 4 Intake	OK	39 degrees C / 102 degrees F
ADC 4 Exhaust	OK	49 degrees C / 120 degrees F
ADC 4 ADC-XF1	OK	60 degrees C / 140 degrees F
ADC 4 ADC-XF0	OK	61 degrees C / 141 degrees F
ADC 5 Intake	OK	38 degrees C / 100 degrees F
ADC 5 Exhaust	OK	52 degrees C / 125 degrees F
ADC 5 ADC-XF1	OK	55 degrees C / 131 degrees F
ADC 5 ADC-XF0	OK	65 degrees C / 149 degrees F
ADC 6 Intake	OK	39 degrees C / 102 degrees F
ADC 6 Exhaust	OK	51 degrees C / 123 degrees F
ADC 6 ADC-XF1	OK	58 degrees C / 136 degrees F
ADC 6 ADC-XF0	OK	63 degrees C / 145 degrees F
ADC 7 Intake	OK	39 degrees C / 102 degrees F
ADC 7 Exhaust	OK	52 degrees C / 125 degrees F
ADC 7 ADC-XF1	OK	61 degrees C / 141 degrees F
ADC 7 ADC-XF0	OK	68 degrees C / 154 degrees F
ADC 8 Intake	OK	39 degrees C / 102 degrees F
ADC 8 Exhaust	OK	50 degrees C / 122 degrees F
ADC 8 ADC-XF1	OK	64 degrees C / 147 degrees F
ADC 8 ADC-XF0	OK	63 degrees C / 145 degrees F
ADC 9 Intake	OK	41 degrees C / 105 degrees F
ADC 9 Exhaust	OK	50 degrees C / 122 degrees F

ADC 9 ADC-XF1	OK	60 degrees C / 140 degrees F
ADC 9 ADC-XF0	OK	62 degrees C / 143 degrees F
ADC 10 Intake	OK	46 degrees C / 114 degrees F
ADC 10 Exhaust	OK	53 degrees C / 127 degrees F
ADC 10 ADC-XF1	OK	66 degrees C / 150 degrees F
ADC 10 ADC-XF0	OK	65 degrees C / 149 degrees F
ADC 11 Intake	OK	46 degrees C / 114 degrees F
ADC 11 Exhaust	OK	53 degrees C / 127 degrees F
ADC 11 ADC-XF1	OK	63 degrees C / 145 degrees F
ADC 11 ADC-XF0	OK	64 degrees C / 147 degrees F
ADC 12 Intake	OK	47 degrees C / 116 degrees F
ADC 12 Exhaust	OK	53 degrees C / 127 degrees F
ADC 12 ADC-XF1	OK	65 degrees C / 149 degrees F
ADC 12 ADC-XF0	OK	65 degrees C / 149 degrees F
ADC 13 Intake	OK	48 degrees C / 118 degrees F
ADC 13 Exhaust	OK	55 degrees C / 131 degrees F
ADC 13 ADC-XF1	OK	65 degrees C / 149 degrees F
ADC 13 ADC-XF0	OK	67 degrees C / 152 degrees F
ADC 14 Intake	OK	49 degrees C / 120 degrees F
ADC 14 Exhaust	OK	57 degrees C / 134 degrees F
ADC 14 ADC-XF1	OK	68 degrees C / 154 degrees F
ADC 14 ADC-XF0	OK	72 degrees C / 161 degrees F
ADC 15 Intake	OK	50 degrees C / 122 degrees F
ADC 15 Exhaust	OK	56 degrees C / 132 degrees F
ADC 15 ADC-XF1	OK	68 degrees C / 154 degrees F
ADC 15 ADC-XF0	OK	68 degrees C / 154 degrees F
ADC 16 Intake	OK	51 degrees C / 123 degrees F
ADC 16 Exhaust	OK	57 degrees C / 134 degrees F
ADC 16 ADC-XF1	OK	67 degrees C / 152 degrees F
ADC 16 ADC-XF0	OK	68 degrees C / 154 degrees F
ADC 17 Intake	OK	51 degrees C / 123 degrees F
ADC 17 Exhaust	OK	57 degrees C / 134 degrees F
ADC 17 ADC-XF1	OK	69 degrees C / 156 degrees F
ADC 17 ADC-XF0	OK	69 degrees C / 156 degrees F
ADC 18 Intake	OK	52 degrees C / 125 degrees F
ADC 18 Exhaust	OK	58 degrees C / 136 degrees F
ADC 18 ADC-XF1	OK	67 degrees C / 152 degrees F
ADC 18 ADC-XF0	OK	72 degrees C / 161 degrees F
ADC 19 Intake	OK	50 degrees C / 122 degrees F
ADC 19 Exhaust	OK	58 degrees C / 136 degrees F
ADC 19 ADC-XF1	OK	68 degrees C / 154 degrees F
ADC 19 ADC-XF0	OK	71 degrees C / 159 degrees F

### show chassis environment monitored (MX2008 Router)

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user@host> show chassis environment monitored
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Class	Item	Status	Measurement
Temp	CB 0 Inlet1	OK	37 degrees C / 98 degrees F
	CB 0 Inlet2	OK	46 degrees C / 114 degrees F
	CB 0 Inlet3	OK	44 degrees C / 111 degrees F
	CB 0 Inlet4	OK	42 degrees C / 107 degrees F
	CB 0 Exhaust1	OK	30 degrees C / 86 degrees F
	CB 0 Exhaust2	OK	40 degrees C / 104 degrees F
	CB 0 Exhaust3	OK	48 degrees C / 118 degrees F
	CB 0 Exhaust4	OK	46 degrees C / 114 degrees F
	CB 1 Inlet1	OK	30 degrees C / 86 degrees F
	CB 1 Inlet2	OK	31 degrees C / 87 degrees F
	CB 1 Inlet3	OK	29 degrees C / 84 degrees F
	CB 1 Inlet4	OK	32 degrees C / 89 degrees F

CB 1 Exhaust1	OK	30 degrees C / 86 degrees F
CB 1 Exhaust2	OK	33 degrees C / 91 degrees F
CB 1 Exhaust3	OK	34 degrees C / 93 degrees F
CB 1 Exhaust4	OK	35 degrees C / 95 degrees F
Routing Engine 0 CPU	OK	76 degrees C / 168 degrees F
Routing Engine 1 CPU	OK	47 degrees C / 116 degrees F
SFB 0 Inlet2	OK	44 degrees C / 111 degrees F
SFB 0 Exhaust1	OK	39 degrees C / 102 degrees F
SFB 0 Inlet1	OK	41 degrees C / 105 degrees F
SFB 0 Exhaust2	OK	45 degrees C / 113 degrees F
SFB 0 SFB2-PF-local	OK	45 degrees C / 113 degrees F
SFB 0 SFB2-PF-die	OK	51 degrees C / 123 degrees F
SFB 1 Inlet2	OK	30 degrees C / 86 degrees F
SFB 1 Exhaust1	OK	27 degrees C / 80 degrees F
SFB 1 Inlet1	OK	28 degrees C / 82 degrees F
SFB 1 Exhaust2	OK	31 degrees C / 87 degrees F
SFB 1 SFB2-PF-local	OK	30 degrees C / 86 degrees F
SFB 1 SFB2-PF-die	OK	37 degrees C / 98 degrees F
SFB 2 Inlet2	OK	28 degrees C / 82 degrees F
SFB 2 Exhaust1	OK	26 degrees C / 78 degrees F
SFB 2 Inlet1	OK	27 degrees C / 80 degrees F
SFB 2 Exhaust2	OK	28 degrees C / 82 degrees F
SFB 2 SFB2-PF-local	OK	27 degrees C / 80 degrees F
SFB 2 SFB2-PF-die	OK	33 degrees C / 91 degrees F
SFB 3 Inlet2	OK	28 degrees C / 82 degrees F
SFB 3 Exhaust1	OK	26 degrees C / 78 degrees F
SFB 3 Inlet1	OK	26 degrees C / 78 degrees F
SFB 3 Exhaust2	OK	28 degrees C / 82 degrees F
SFB 3 SFB2-PF-local	OK	27 degrees C / 80 degrees F
SFB 3 SFB2-PF-die	OK	33 degrees C / 91 degrees F
SFB 4 Inlet2	OK	28 degrees C / 82 degrees F
SFB 4 Exhaust1	OK	26 degrees C / 78 degrees F
SFB 4 Inlet1	OK	26 degrees C / 78 degrees F
SFB 4 Exhaust2	OK	28 degrees C / 82 degrees F
SFB 4 SFB2-PF-local	OK	27 degrees C / 80 degrees F
SFB 4 SFB2-PF-die	OK	32 degrees C / 89 degrees F
SFB 5 Inlet2	OK	29 degrees C / 84 degrees F
SFB 5 Exhaust1	OK	27 degrees C / 80 degrees F
SFB 5 Inlet1	OK	27 degrees C / 80 degrees F
SFB 5 Exhaust2	OK	29 degrees C / 84 degrees F
SFB 5 SFB2-PF-local	OK	28 degrees C / 82 degrees F
SFB 5 SFB2-PF-die	OK	34 degrees C / 93 degrees F
SFB 6 Inlet2	OK	34 degrees C / 93 degrees F
SFB 6 Exhaust1	OK	32 degrees C / 89 degrees F
SFB 6 Inlet1	OK	31 degrees C / 87 degrees F
SFB 6 Exhaust2	OK	34 degrees C / 93 degrees F
SFB 6 SFB2-PF-local	OK	34 degrees C / 93 degrees F
SFB 6 SFB2-PF-die	OK	40 degrees C / 104 degrees F
SFB 7 Inlet2	OK	29 degrees C / 84 degrees F
SFB 7 Exhaust1	OK	28 degrees C / 82 degrees F
SFB 7 Inlet1	OK	29 degrees C / 84 degrees F
SFB 7 Exhaust2	OK	29 degrees C / 84 degrees F
SFB 7 SFB2-PF-local	OK	28 degrees C / 82 degrees F
SFB 7 SFB2-PF-die	OK	33 degrees C / 91 degrees F
FPC 0 Intake	OK	29 degrees C / 84 degrees F
FPC 0 Exhaust A	OK	43 degrees C / 109 degrees F
FPC 0 Exhaust B	OK	42 degrees C / 107 degrees F
FPC 0 XL 0 TSen	OK	39 degrees C / 102 degrees F
FPC 0 XL 0 Chip	OK	53 degrees C / 127 degrees F
FPC 0 XL 0 XR2 0 TSen	OK	39 degrees C / 102 degrees F

FPC 0 XL 0 XR2 0 Chip	OK	60 degrees C / 140 degrees F
FPC 0 XL 0 XR2 1 TSen	OK	39 degrees C / 102 degrees F
FPC 0 XL 0 XR2 1 Chip	OK	60 degrees C / 140 degrees F
FPC 0 XL 1 TSen	OK	30 degrees C / 86 degrees F
FPC 0 XL 1 Chip	OK	43 degrees C / 109 degrees F
FPC 0 XL 1 XR2 0 TSen	OK	30 degrees C / 86 degrees F
FPC 0 XL 1 XR2 0 Chip	OK	50 degrees C / 122 degrees F
FPC 0 XL 1 XR2 1 TSen	OK	30 degrees C / 86 degrees F
FPC 0 XL 1 XR2 1 Chip	OK	51 degrees C / 123 degrees F
FPC 0 XM 0 TSen	OK	42 degrees C / 107 degrees F
FPC 0 XM 0 Chip	OK	50 degrees C / 122 degrees F
FPC 0 XM 1 TSen	OK	42 degrees C / 107 degrees F
FPC 0 XM 1 Chip	OK	42 degrees C / 107 degrees F
FPC 0 XM 2 TSen	OK	42 degrees C / 107 degrees F
FPC 0 XM 2 Chip	OK	42 degrees C / 107 degrees F
FPC 0 XM 3 TSen	OK	42 degrees C / 107 degrees F
FPC 0 XM 3 Chip	OK	40 degrees C / 104 degrees F
FPC 0 PCIe Switch TSen	OK	42 degrees C / 107 degrees F
FPC 0 PCIe Switch Chip	OK	22 degrees C / 71 degrees F
FPC 1 Intake	OK	29 degrees C / 84 degrees F
FPC 1 Exhaust A	OK	52 degrees C / 125 degrees F
FPC 1 Exhaust B	OK	44 degrees C / 111 degrees F
FPC 1 EA0 TSen	OK	55 degrees C / 131 degrees F
FPC 1 EA0 Chip	OK	48 degrees C / 118 degrees F
FPC 1 EA0_XR0 TSen	OK	55 degrees C / 131 degrees F
FPC 1 EA0_XR0 Chip	OK	57 degrees C / 134 degrees F
FPC 1 EA0_XR1 TSen	OK	55 degrees C / 131 degrees F
FPC 1 EA0_XR1 Chip	OK	54 degrees C / 129 degrees F
FPC 1 EA1 TSen	OK	55 degrees C / 131 degrees F
FPC 1 EA1 Chip	OK	51 degrees C / 123 degrees F
FPC 1 EA1_XR0 TSen	OK	55 degrees C / 131 degrees F
FPC 1 EA1_XR0 Chip	OK	58 degrees C / 136 degrees F
FPC 1 EA1_XR1 TSen	OK	55 degrees C / 131 degrees F
FPC 1 EA1_XR1 Chip	OK	59 degrees C / 138 degrees F
FPC 1 PEX TSen	OK	55 degrees C / 131 degrees F
FPC 1 PEX Chip	OK	39 degrees C / 102 degrees F
FPC 1 EA2 TSen	OK	43 degrees C / 109 degrees F
FPC 1 EA2 Chip	OK	39 degrees C / 102 degrees F
FPC 1 EA2_XR0 TSen	OK	43 degrees C / 109 degrees F
FPC 1 EA2_XR0 Chip	OK	46 degrees C / 114 degrees F
FPC 1 EA2_XR1 TSen	OK	43 degrees C / 109 degrees F
FPC 1 EA2_XR1 Chip	OK	43 degrees C / 109 degrees F
FPC 1 EA3 TSen	OK	43 degrees C / 109 degrees F
FPC 1 EA3 Chip	OK	40 degrees C / 104 degrees F
FPC 1 EA3_XR0 TSen	OK	43 degrees C / 109 degrees F
FPC 1 EA3_XR0 Chip	OK	51 degrees C / 123 degrees F
FPC 1 EA3_XR1 TSen	OK	43 degrees C / 109 degrees F
FPC 1 EA3_XR1 Chip	OK	47 degrees C / 116 degrees F
FPC 1 EA0_HMC0 Logic die	OK	61 degrees C / 141 degrees F
FPC 1 EA0_HMC0 DRAM botm	OK	58 degrees C / 136 degrees F
FPC 1 EA0_HMC1 Logic die	OK	62 degrees C / 143 degrees F
FPC 1 EA0_HMC1 DRAM botm	OK	59 degrees C / 138 degrees F
FPC 1 EA0_HMC2 Logic die	OK	59 degrees C / 138 degrees F
FPC 1 EA0_HMC2 DRAM botm	OK	56 degrees C / 132 degrees F
FPC 1 EA1_HMC0 Logic die	OK	66 degrees C / 150 degrees F
FPC 1 EA1_HMC0 DRAM botm	OK	63 degrees C / 145 degrees F
FPC 1 EA1_HMC1 Logic die	OK	65 degrees C / 149 degrees F
FPC 1 EA1_HMC1 DRAM botm	OK	62 degrees C / 143 degrees F
FPC 1 EA1_HMC2 Logic die	OK	63 degrees C / 145 degrees F
FPC 1 EA1_HMC2 DRAM botm	OK	60 degrees C / 140 degrees F



FPC 1 EA2_HMC0 Logic die	OK	51 degrees C / 123 degrees F
FPC 1 EA2_HMC0 DRAM botm	OK	48 degrees C / 118 degrees F
FPC 1 EA2_HMC1 Logic die	OK	55 degrees C / 131 degrees F
FPC 1 EA2_HMC1 DRAM botm	OK	52 degrees C / 125 degrees F
FPC 1 EA2_HMC2 Logic die	OK	52 degrees C / 125 degrees F
FPC 1 EA2_HMC2 DRAM botm	OK	49 degrees C / 120 degrees F
FPC 1 EA3_HMC0 Logic die	OK	51 degrees C / 123 degrees F
FPC 1 EA3_HMC0 DRAM botm	OK	48 degrees C / 118 degrees F
FPC 1 EA3_HMC1 Logic die	OK	51 degrees C / 123 degrees F
FPC 1 EA3_HMC1 DRAM botm	OK	48 degrees C / 118 degrees F
FPC 1 EA3_HMC2 Logic die	OK	52 degrees C / 125 degrees F
FPC 1 EA3_HMC2 DRAM botm	OK	49 degrees C / 120 degrees F
FPC 7 Intake	OK	31 degrees C / 87 degrees F
FPC 7 Exhaust A	OK	46 degrees C / 114 degrees F
FPC 7 Exhaust B	OK	38 degrees C / 100 degrees F
FPC 7 QX 0 TSen	OK	49 degrees C / 120 degrees F
FPC 7 QX 0 Chip	OK	52 degrees C / 125 degrees F
FPC 7 LU 0 TCAM TSen	OK	49 degrees C / 120 degrees F
FPC 7 LU 0 TCAM Chip	OK	52 degrees C / 125 degrees F
FPC 7 LU 0 TSen	OK	49 degrees C / 120 degrees F
FPC 7 LU 0 Chip	OK	51 degrees C / 123 degrees F
FPC 7 MQ 0 TSen	OK	49 degrees C / 120 degrees F
FPC 7 MQ 0 Chip	OK	55 degrees C / 131 degrees F
FPC 7 QX 1 TSen	OK	41 degrees C / 105 degrees F
FPC 7 QX 1 Chip	OK	42 degrees C / 107 degrees F
FPC 7 LU 1 TCAM TSen	OK	41 degrees C / 105 degrees F
FPC 7 LU 1 TCAM Chip	OK	43 degrees C / 109 degrees F
FPC 7 LU 1 TSen	OK	41 degrees C / 105 degrees F
FPC 7 LU 1 Chip	OK	46 degrees C / 114 degrees F
FPC 7 MQ 1 TSen	OK	41 degrees C / 105 degrees F
FPC 7 MQ 1 Chip	OK	47 degrees C / 116 degrees F
ADC 7 Intake	OK	32 degrees C / 89 degrees F
ADC 7 Exhaust	OK	39 degrees C / 102 degrees F
ADC 7 ADC-XF1	OK	46 degrees C / 114 degrees F
ADC 7 ADC-XF0	OK	54 degrees C / 129 degrees F

### show chassis environment monitored (MX10008 Router)

```
user@host> show chassis environment monitored
```

Class	Item	Status	Measurement
	Routing Engine 0 CPU		
	Routing Engine 1 CPU		
Temp	CB 0 Intake A Temp Sensor	OK	24 degrees C / 75 degrees F
	CB 0 Intake B Temp Sensor	OK	24 degrees C / 75 degrees F
	CB 0 Exhaust A Temp Sensor	OK	28 degrees C / 82 degrees F
	CB 0 Exhaust B Temp Sensor	OK	30 degrees C / 86 degrees F
	CB 0 Middle Temp Sensor	OK	28 degrees C / 82 degrees F
	CB 1 Intake A Temp Sensor	OK	24 degrees C / 75 degrees F
	CB 1 Intake B Temp Sensor	OK	23 degrees C / 73 degrees F
	CB 1 Exhaust A Temp Sensor	OK	27 degrees C / 80 degrees F
	CB 1 Exhaust B Temp Sensor	OK	30 degrees C / 86 degrees F
	CB 1 Middle Temp Sensor	OK	28 degrees C / 82 degrees F
	FPC 0 Intake-A Temp Sensor	OK	32 degrees C / 89 degrees F
	FPC 0 Exhaust-A Temp Sensor	OK	44 degrees C / 111 degrees F
	FPC 0 Exhaust-B Temp Sensor	OK	49 degrees C / 120 degrees F
	FPC 0 EA0 Temp Sensor	OK	67 degrees C / 152 degrees F
	FPC 0 EA0_XR0 Temp Sensor	OK	69 degrees C / 156 degrees F
	FPC 0 EA0_XR1 Temp Sensor	OK	73 degrees C / 163 degrees F
	FPC 0 EA1 Temp Sensor	OK	61 degrees C / 141 degrees F

FPC 0 EA1_XR0 Temp Sensor	OK	65 degrees C / 149 degrees F
FPC 0 EA1_XR1 Temp Sensor	OK	63 degrees C / 145 degrees F
FPC 0 EA2 Temp Sensor	OK	69 degrees C / 156 degrees F
FPC 0 EA2_XR0 Temp Sensor	OK	73 degrees C / 163 degrees F
FPC 0 EA2_XR1 Temp Sensor	OK	72 degrees C / 161 degrees F
FPC 0 EA3 Temp Sensor	OK	64 degrees C / 147 degrees F
FPC 0 EA3_XR0 Temp Sensor	OK	66 degrees C / 150 degrees F
FPC 0 EA3_XR1 Temp Sensor	OK	65 degrees C / 149 degrees F
FPC 0 EA4 Temp Sensor	OK	71 degrees C / 159 degrees F
FPC 0 EA4_XR0 Temp Sensor	OK	72 degrees C / 161 degrees F
FPC 0 EA4_XR1 Temp Sensor	OK	71 degrees C / 159 degrees F
FPC 0 EA5 Temp Sensor	OK	58 degrees C / 136 degrees F
FPC 0 EA5_XR0 Temp Sensor	OK	62 degrees C / 143 degrees F
FPC 0 EA5_XR1 Temp Sensor	OK	63 degrees C / 145 degrees F
FPC 0 EA0_HMC0 Logic die	OK	75 degrees C / 167 degrees F
FPC 0 EA0_HMC0 DRAM botm	OK	72 degrees C / 161 degrees F
FPC 0 EA0_HMC1 Logic die	OK	76 degrees C / 168 degrees F
FPC 0 EA0_HMC1 DRAM botm	OK	73 degrees C / 163 degrees F
FPC 0 EA0_HMC2 Logic die	OK	77 degrees C / 170 degrees F
FPC 0 EA0_HMC2 DRAM botm	OK	74 degrees C / 165 degrees F
FPC 0 EA1_HMC0 Logic die	OK	73 degrees C / 163 degrees F
FPC 0 EA1_HMC0 DRAM botm	OK	70 degrees C / 158 degrees F
FPC 0 EA1_HMC1 Logic die	OK	73 degrees C / 163 degrees F
FPC 0 EA1_HMC1 DRAM botm	OK	70 degrees C / 158 degrees F
FPC 0 EA1_HMC2 Logic die	OK	72 degrees C / 161 degrees F
FPC 0 EA1_HMC2 DRAM botm	OK	69 degrees C / 156 degrees F
FPC 0 EA2_HMC0 Logic die	OK	80 degrees C / 176 degrees F
FPC 0 EA2_HMC0 DRAM botm	OK	77 degrees C / 170 degrees F
FPC 0 EA2_HMC1 Logic die	OK	81 degrees C / 177 degrees F
FPC 0 EA2_HMC1 DRAM botm	OK	78 degrees C / 172 degrees F
FPC 0 EA2_HMC2 Logic die	OK	80 degrees C / 176 degrees F
FPC 0 EA2_HMC2 DRAM botm	OK	77 degrees C / 170 degrees F
FPC 0 EA3_HMC0 Logic die	OK	77 degrees C / 170 degrees F
FPC 0 EA3_HMC0 DRAM botm	OK	74 degrees C / 165 degrees F
FPC 0 EA3_HMC1 Logic die	OK	78 degrees C / 172 degrees F
FPC 0 EA3_HMC1 DRAM botm	OK	75 degrees C / 167 degrees F
FPC 0 EA3_HMC2 Logic die	OK	77 degrees C / 170 degrees F
FPC 0 EA3_HMC2 DRAM botm	OK	74 degrees C / 165 degrees F
FPC 0 EA4_HMC0 Logic die	OK	80 degrees C / 176 degrees F
FPC 0 EA4_HMC0 DRAM botm	OK	77 degrees C / 170 degrees F
FPC 0 EA4_HMC1 Logic die	OK	81 degrees C / 177 degrees F
FPC 0 EA4_HMC1 DRAM botm	OK	78 degrees C / 172 degrees F
FPC 0 EA4_HMC2 Logic die	OK	80 degrees C / 176 degrees F
FPC 0 EA4_HMC2 DRAM botm	OK	77 degrees C / 170 degrees F
FPC 0 EA5_HMC0 Logic die	OK	69 degrees C / 156 degrees F
FPC 0 EA5_HMC0 DRAM botm	OK	66 degrees C / 150 degrees F
FPC 0 EA5_HMC1 Logic die	OK	68 degrees C / 154 degrees F
FPC 0 EA5_HMC1 DRAM botm	OK	65 degrees C / 149 degrees F
FPC 0 EA5_HMC2 Logic die	OK	68 degrees C / 154 degrees F
FPC 0 EA5_HMC2 DRAM botm	OK	65 degrees C / 149 degrees F
FPC 2 Intake-A Temp Sensor	OK	33 degrees C / 91 degrees F
FPC 2 Exhaust-A Temp Sensor	OK	52 degrees C / 125 degrees F
FPC 2 Exhaust-B Temp Sensor	OK	50 degrees C / 122 degrees F
FPC 2 EA0 Temp Sensor	OK	71 degrees C / 159 degrees F
FPC 2 EA0_XR0 Temp Sensor	OK	75 degrees C / 167 degrees F
FPC 2 EA0_XR1 Temp Sensor	OK	79 degrees C / 174 degrees F
FPC 2 EA1 Temp Sensor	OK	64 degrees C / 147 degrees F
FPC 2 EA1_XR0 Temp Sensor	OK	68 degrees C / 154 degrees F
FPC 2 EA1_XR1 Temp Sensor	OK	66 degrees C / 150 degrees F
FPC 2 EA2 Temp Sensor	OK	75 degrees C / 167 degrees F

FPC 2 EA2_XR0 Temp Sensor	OK	81 degrees C / 177 degrees F
FPC 2 EA2_XR1 Temp Sensor	OK	81 degrees C / 177 degrees F
FPC 2 EA3 Temp Sensor	OK	67 degrees C / 152 degrees F
FPC 2 EA3_XR0 Temp Sensor	OK	69 degrees C / 156 degrees F
FPC 2 EA3_XR1 Temp Sensor	OK	69 degrees C / 156 degrees F
FPC 2 EA4 Temp Sensor	OK	75 degrees C / 167 degrees F
FPC 2 EA4_XR0 Temp Sensor	OK	76 degrees C / 168 degrees F
FPC 2 EA4_XR1 Temp Sensor	OK	75 degrees C / 167 degrees F
FPC 2 EA5 Temp Sensor	OK	60 degrees C / 140 degrees F
FPC 2 EA5_XR0 Temp Sensor	OK	64 degrees C / 147 degrees F
FPC 2 EA5_XR1 Temp Sensor	OK	65 degrees C / 149 degrees F
FPC 2 EA0_HMC0 Logic die	OK	84 degrees C / 183 degrees F
FPC 2 EA0_HMC0 DRAM botm	OK	81 degrees C / 177 degrees F
FPC 2 EA0_HMC1 Logic die	OK	85 degrees C / 185 degrees F
FPC 2 EA0_HMC1 DRAM botm	OK	82 degrees C / 179 degrees F
FPC 2 EA0_HMC2 Logic die	OK	83 degrees C / 181 degrees F
FPC 2 EA0_HMC2 DRAM botm	OK	80 degrees C / 176 degrees F
FPC 2 EA1_HMC0 Logic die	OK	76 degrees C / 168 degrees F
FPC 2 EA1_HMC0 DRAM botm	OK	73 degrees C / 163 degrees F
FPC 2 EA1_HMC1 Logic die	OK	77 degrees C / 170 degrees F
FPC 2 EA1_HMC1 DRAM botm	OK	74 degrees C / 165 degrees F
FPC 2 EA1_HMC2 Logic die	OK	76 degrees C / 168 degrees F
FPC 2 EA1_HMC2 DRAM botm	OK	73 degrees C / 163 degrees F
FPC 2 EA2_HMC0 Logic die	OK	87 degrees C / 188 degrees F
FPC 2 EA2_HMC0 DRAM botm	OK	84 degrees C / 183 degrees F
FPC 2 EA2_HMC1 Logic die	OK	88 degrees C / 190 degrees F
FPC 2 EA2_HMC1 DRAM botm	OK	85 degrees C / 185 degrees F
FPC 2 EA2_HMC2 Logic die	OK	88 degrees C / 190 degrees F
FPC 2 EA2_HMC2 DRAM botm	OK	85 degrees C / 185 degrees F
FPC 2 EA3_HMC0 Logic die	OK	81 degrees C / 177 degrees F
FPC 2 EA3_HMC0 DRAM botm	OK	78 degrees C / 172 degrees F
FPC 2 EA3_HMC1 Logic die	OK	81 degrees C / 177 degrees F
FPC 2 EA3_HMC1 DRAM botm	OK	78 degrees C / 172 degrees F
FPC 2 EA3_HMC2 Logic die	OK	81 degrees C / 177 degrees F
FPC 2 EA3_HMC2 DRAM botm	OK	78 degrees C / 172 degrees F
FPC 2 EA4_HMC0 Logic die	OK	88 degrees C / 190 degrees F
FPC 2 EA4_HMC0 DRAM botm	OK	85 degrees C / 185 degrees F
FPC 2 EA4_HMC1 Logic die	OK	90 degrees C / 194 degrees F
FPC 2 EA4_HMC1 DRAM botm	OK	87 degrees C / 188 degrees F
FPC 2 EA4_HMC2 Logic die	OK	81 degrees C / 177 degrees F
FPC 2 EA4_HMC2 DRAM botm	OK	78 degrees C / 172 degrees F
FPC 2 EA5_HMC0 Logic die	OK	72 degrees C / 161 degrees F
FPC 2 EA5_HMC0 DRAM botm	OK	69 degrees C / 156 degrees F
FPC 2 EA5_HMC1 Logic die	OK	69 degrees C / 156 degrees F
FPC 2 EA5_HMC1 DRAM botm	OK	66 degrees C / 150 degrees F
FPC 2 EA5_HMC2 Logic die	OK	73 degrees C / 163 degrees F
FPC 2 EA5_HMC2 DRAM botm	OK	70 degrees C / 158 degrees F
FPC 3 Intake-A Temp Sensor	OK	30 degrees C / 86 degrees F
FPC 3 Exhaust-A Temp Sensor	OK	48 degrees C / 118 degrees F
FPC 3 Exhaust-B Temp Sensor	OK	45 degrees C / 113 degrees F
FPC 3 EA0 Temp Sensor	OK	60 degrees C / 140 degrees F
FPC 3 EA0_XR0 Temp Sensor	OK	65 degrees C / 149 degrees F
FPC 3 EA0_XR1 Temp Sensor	OK	67 degrees C / 152 degrees F
FPC 3 EA1 Temp Sensor	OK	54 degrees C / 129 degrees F
FPC 3 EA1_XR0 Temp Sensor	OK	60 degrees C / 140 degrees F
FPC 3 EA1_XR1 Temp Sensor	OK	59 degrees C / 138 degrees F
FPC 3 EA2 Temp Sensor	OK	62 degrees C / 143 degrees F
FPC 3 EA2_XR0 Temp Sensor	OK	67 degrees C / 152 degrees F
FPC 3 EA2_XR1 Temp Sensor	OK	67 degrees C / 152 degrees F
FPC 3 EA3 Temp Sensor	OK	55 degrees C / 131 degrees F

	FPC 3 EA3_XR0 Temp Sensor	OK	57 degrees C / 134 degrees F
	FPC 3 EA3_XR1 Temp Sensor	OK	57 degrees C / 134 degrees F
	FPC 3 EA4 Temp Sensor	OK	68 degrees C / 154 degrees F
	FPC 3 EA4_XR0 Temp Sensor	OK	71 degrees C / 159 degrees F
	FPC 3 EA4_XR1 Temp Sensor	OK	70 degrees C / 158 degrees F
	FPC 3 EA5 Temp Sensor	OK	55 degrees C / 131 degrees F
	FPC 3 EA5_XR0 Temp Sensor	OK	58 degrees C / 136 degrees F
	FPC 3 EA5_XR1 Temp Sensor	OK	59 degrees C / 138 degrees F
	FPC 3 EA0_HMC0 Logic die	OK	69 degrees C / 156 degrees F
	FPC 3 EA0_HMC0 DRAM botm	OK	66 degrees C / 150 degrees F
	FPC 3 EA0_HMC1 Logic die	OK	70 degrees C / 158 degrees F
	FPC 3 EA0_HMC1 DRAM botm	OK	67 degrees C / 152 degrees F
	FPC 3 EA0_HMC2 Logic die	OK	70 degrees C / 158 degrees F
	FPC 3 EA0_HMC2 DRAM botm	OK	67 degrees C / 152 degrees F
	FPC 3 EA1_HMC0 Logic die	OK	68 degrees C / 154 degrees F
	FPC 3 EA1_HMC0 DRAM botm	OK	65 degrees C / 149 degrees F
	FPC 3 EA1_HMC1 Logic die	OK	65 degrees C / 149 degrees F
	FPC 3 EA1_HMC1 DRAM botm	OK	62 degrees C / 143 degrees F
	FPC 3 EA1_HMC2 Logic die	OK	64 degrees C / 147 degrees F
	FPC 3 EA1_HMC2 DRAM botm	OK	61 degrees C / 141 degrees F
	FPC 3 EA2_HMC0 Logic die	OK	74 degrees C / 165 degrees F
	FPC 3 EA2_HMC0 DRAM botm	OK	71 degrees C / 159 degrees F
	FPC 3 EA2_HMC1 Logic die	OK	76 degrees C / 168 degrees F
	FPC 3 EA2_HMC1 DRAM botm	OK	73 degrees C / 163 degrees F
	FPC 3 EA2_HMC2 Logic die	OK	74 degrees C / 165 degrees F
	FPC 3 EA2_HMC2 DRAM botm	OK	71 degrees C / 159 degrees F
	FPC 3 EA3_HMC0 Logic die	OK	70 degrees C / 158 degrees F
	FPC 3 EA3_HMC0 DRAM botm	OK	67 degrees C / 152 degrees F
	FPC 3 EA3_HMC1 Logic die	OK	68 degrees C / 154 degrees F
	FPC 3 EA3_HMC1 DRAM botm	OK	65 degrees C / 149 degrees F
	FPC 3 EA3_HMC2 Logic die	OK	68 degrees C / 154 degrees F
	FPC 3 EA3_HMC2 DRAM botm	OK	65 degrees C / 149 degrees F
	FPC 3 EA4_HMC0 Logic die	OK	82 degrees C / 179 degrees F
	FPC 3 EA4_HMC0 DRAM botm	OK	79 degrees C / 174 degrees F
	FPC 3 EA4_HMC1 Logic die	OK	80 degrees C / 176 degrees F
	FPC 3 EA4_HMC1 DRAM botm	OK	77 degrees C / 170 degrees F
	FPC 3 EA4_HMC2 Logic die	OK	81 degrees C / 177 degrees F
	FPC 3 EA4_HMC2 DRAM botm	OK	78 degrees C / 172 degrees F
	FPC 3 EA5_HMC0 Logic die	OK	69 degrees C / 156 degrees F
	FPC 3 EA5_HMC0 DRAM botm	OK	66 degrees C / 150 degrees F
	FPC 3 EA5_HMC1 Logic die	OK	70 degrees C / 158 degrees F
	FPC 3 EA5_HMC1 DRAM botm	OK	67 degrees C / 152 degrees F
	FPC 3 EA5_HMC2 Logic die	OK	69 degrees C / 156 degrees F
	FPC 3 EA5_HMC2 DRAM botm	OK	66 degrees C / 150 degrees F
Power	PEM 0	OK	29 degrees C / 84 degrees F
	PEM 1	OK	27 degrees C / 80 degrees F
	PEM 2	OK	30 degrees C / 86 degrees F
	PEM 3	Check	
	PEM 4	Check	
	PEM 5	Check	
Fans	Fan Tray 0 Fan 0	OK	Spinning at normal speed
	Fan Tray 0 Fan 1	OK	Spinning at normal speed
	Fan Tray 0 Fan 2	OK	Spinning at normal speed
	Fan Tray 0 Fan 3	OK	Spinning at normal speed
	Fan Tray 0 Fan 4	Failed	
	Fan Tray 0 Fan 5	Failed	
	Fan Tray 0 Fan 6	OK	Spinning at normal speed
	Fan Tray 0 Fan 7	OK	Spinning at normal speed
	Fan Tray 0 Fan 8	OK	Spinning at normal speed
	Fan Tray 0 Fan 9	OK	Spinning at normal speed

Fan Tray 0 Fan 10	OK	Spinning at normal speed
Fan Tray 1 Fan 0	OK	Spinning at normal speed
Fan Tray 1 Fan 1	OK	Spinning at normal speed
Fan Tray 1 Fan 2	OK	Spinning at normal speed
Fan Tray 1 Fan 3	OK	Spinning at normal speed
Fan Tray 1 Fan 4	OK	Spinning at normal speed
Fan Tray 1 Fan 5	OK	Spinning at normal speed
Fan Tray 1 Fan 6	OK	Spinning at normal speed
Fan Tray 1 Fan 7	OK	Spinning at normal speed
Fan Tray 1 Fan 8	OK	Spinning at normal speed
Fan Tray 1 Fan 9	OK	Spinning at normal speed
Fan Tray 1 Fan 10	OK	Spinning at normal speed
SFB 0 Intake-A	OK	33 degrees C / 91 degrees F
SFB 0 Intake-B	OK	22 degrees C / 71 degrees F
SFB 0 Exhaust-A	OK	27 degrees C / 80 degrees F
SFB 0 Exhaust-B	OK	32 degrees C / 89 degrees F
SFB 0 PF0	OK	40 degrees C / 104 degrees F
SFB 0 PF1	OK	29 degrees C / 84 degrees F
SFB 1 Intake-A	OK	43 degrees C / 109 degrees F
SFB 1 Intake-B	OK	21 degrees C / 69 degrees F
SFB 1 Exhaust-A	OK	25 degrees C / 77 degrees F
SFB 1 Exhaust-B	OK	44 degrees C / 111 degrees F
SFB 1 PF0	OK	50 degrees C / 122 degrees F
SFB 1 PF1	OK	29 degrees C / 84 degrees F
SFB 2 Intake-A	OK	39 degrees C / 102 degrees F
SFB 2 Intake-B	OK	21 degrees C / 69 degrees F
SFB 2 Exhaust-A	OK	25 degrees C / 77 degrees F
SFB 2 Exhaust-B	OK	38 degrees C / 100 degrees F
SFB 2 PF0	OK	45 degrees C / 113 degrees F
SFB 2 PF1	OK	30 degrees C / 86 degrees F
SFB 3 Intake-A	OK	37 degrees C / 98 degrees F
SFB 3 Intake-B	OK	21 degrees C / 69 degrees F
SFB 3 Exhaust-A	OK	26 degrees C / 78 degrees F
SFB 3 Exhaust-B	OK	35 degrees C / 95 degrees F
SFB 3 PF0	OK	42 degrees C / 107 degrees F
SFB 3 PF1	OK	30 degrees C / 86 degrees F
SFB 4 Intake-A	OK	31 degrees C / 87 degrees F
SFB 4 Intake-B	OK	20 degrees C / 68 degrees F
SFB 4 Exhaust-A	OK	25 degrees C / 77 degrees F
SFB 4 Exhaust-B	OK	32 degrees C / 89 degrees F
SFB 4 PF0	OK	41 degrees C / 105 degrees F
SFB 4 PF1	OK	30 degrees C / 86 degrees F
SFB 5 Intake-A	OK	30 degrees C / 86 degrees F
SFB 5 Intake-B	OK	21 degrees C / 69 degrees F
SFB 5 Exhaust-A	OK	26 degrees C / 78 degrees F
SFB 5 Exhaust-B	OK	30 degrees C / 86 degrees F
SFB 5 PF0	OK	35 degrees C / 95 degrees F
SFB 5 PF1	OK	34 degrees C / 93 degrees F

## show chassis environment pcg

<b>Syntax</b>	<code>show chassis environment pcg &lt;slot&gt;</code>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	(M40e and M160 routers only) Display environmental information about the Packet Forwarding Engine clock generators (PCGs).
<b>Options</b>	<p><b>none</b>—Display environmental information about both PCGs.</p> <p><b>slot</b>—(Optional) Display environmental information about an individual PCG. Replace <b>slot</b> with 0 or 1.</p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><a href="#">request chassis pcg on page 875</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">show chassis environment pcg (M40e Router) on page 1206</a> <a href="#">show chassis environment pcg (M160 Router) on page 1206</a>
<b>Output Fields</b>	Table 107 on page 1204 lists the output fields for the <b>show chassis environment pcg</b> command. Output fields are listed in the approximate order in which they appear.

*Table 107: show chassis environment pcg Output Fields*

Field Name	Field Description
PCG slot status	Slot number: 0 or 1.
State	<p>Status of PCG:</p> <ul style="list-style-type: none"> <li><b>Present</b>—PCG is detected by the chassis process but is either not supported by the current version of Junos OS or PCG is coming up but is not yet online.</li> <li><b>Online</b>—PCG is powered down. If <b>Online</b>, it can be the <b>Master clock</b> or the <b>Standby clock</b>.</li> <li><b>Offline</b>—PCG is powered down.</li> <li><b>Empty</b>—No PCG is present.</li> </ul>
Temperature	Temperature of the air flowing past the PCG.
Frequency	Frequency setting and measurement for the PCG.

*Table 107: show chassis environment pcg Output Fields (continued)*

Field Name	Field Description
<b>Power</b>	Information about the voltage supplied to the PCG. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
<b>BUS Revision</b>	Revision level of the generic bus device.

## Sample Output

### show chassis environment pcg (M40e Router)

```
user@host> show chassis environment pcg

PCG 0 status:
  State                Online - Master clock
  Temperature           44 degrees C / 111 degrees F
  Frequency:
    Setting             125.00 MHz
    Measurement         124.95 MHz
  Power:
    3.3 V               3266 mV
    5.0 V bias          4964 mV
    8.0 V bias          8112 mV
  BUS Revision         12

PCG 1 status:
  State                Online - Standby
  Temperature           47 degrees C / 116 degrees F
  Frequency:
    Setting             125.00 MHz
    Measurement         124.96 MHz
  Power:
    3.3 V               3271 mV
    5.0 V bias          4979 mV
    8.0 V bias          8117 mV
  BUS Revision         12
```

### show chassis environment pcg (M160 Router)

```
user@host> show chassis environment pcg

PCG 0 status:
  State                Online - Master clock
  Temperature           41 degrees C / 105 degrees F
  Frequency:
    Setting             125.00 MHz
    Measurement         125.03 MHz
  Power:
    3.3 V               3286 mV
    5.0 V bias          5010 mV
    8.0 V bias          8183 mV
  BUS Revision         12

PCG 1 status:
  State                Online - Standby
  Temperature           43 degrees C / 109 degrees F
  Frequency:
    Setting             125.00 MHz
    Measurement         125.01 MHz
  Power:
    3.3 V               3288 mV
    5.0 V bias          4993 mV
    8.0 V bias          8197 mV
  BUS Revision         12
```



## show chassis environment pdu

<b>Syntax</b>	<pre>show chassis environment pdu &lt;none&gt; &lt;slot&gt;</pre>
<b>Release Information</b>	Command introduced in Junos OS Release 12.1X48 for PTX5000 Packet Transport Routers.
<b>Description</b>	<p>Display the environmental status information of a power distribution unit (PDU).</p> <p>Starting from Junos OS Release 14.1, the <b>show chassis environment pdu slot</b> operational mode command output displays environmental status information for the new DC power supply module (PSM) and PDU that are added to provide power to the high-density FPC—FPC2-PTX-P1A.</p> <p>Starting from Junos OS Release 14.2, the power management software in Junos OS tracks the PSM power capacity to identify the power available for the PTX5000 router. Each PSM is assigned a power capability value that is equal to its maximum power rating. Therefore, the total input power—power that the chassis draws from a PDU—is the sum of all the online PSMs' maximum rating. Note that to limit the PDU's output power, the power management software adjusts the maximum rating of the PSMs according to the feed—that is, 60 A, 100 A, or 150 A—selected.</p>
<b>Options</b>	<p><b>none</b>—Display environmental information about all PDUs.</p> <p><b>slot</b> —(Optional) Display environmental information about an individual PDU. For the PTX5000, replace <b>slot</b> with <b>0</b> or <b>1</b>.</p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <i>PTX5000 Packet Transport Router Hardware Guide</i></li> </ul>
<b>List of Sample Output</b>	<p><a href="#">show chassis environment pdu (PTX5000) on page 1208</a></p> <p><a href="#">show chassis environment pdu (PTX5000 Packet Transport Router with DC PSM and PDU) on page 1209</a></p> <p><a href="#">show chassis environment pdu (PTX5000 Packet Transport Router with AC PSM and PDU) on page 1210</a></p> <p><a href="#">show chassis environment pdu (PTX5000 Packet Transport Router after a health check failure on a PSM) on page 1210</a></p>
<b>Output Fields</b>	<a href="#">Table 108 on page 1208</a> lists the output fields for the <b>show chassis environment pdu</b> command. Output fields are listed in the approximate order in which they appear.

Table 108: show chassis environment pdu Output Fields

Field Name	Field Description
PDU slot status	Number of the PDU slot.
PDU - State	Status of the PDU. Status can be <b>Online</b> , <b>Present</b> , or <b>Absent</b> .
PDU - BoostConv	Status of the booster converter.
Feed Switch	Status of the connected input line cord in the AC PDU. Status can be , <b>60A</b> , <b>100A</b> , or <b>150A</b> .
PDU - Hours Used	Number of hours the PDU has been operational.
PDU - Firmware Version	Version level of the firmware running on the PDU.
PSM number status	PSM number. PSMs are numbered <b>0</b> through <b>3</b> .
PSM - State	Status of the PSM. Status can be <b>Online</b> , <b>Present</b> , or <b>Absent</b> .
PSM - Temperature	Temperature of the air flowing past the PSM.
PSM - Fans	Status of the cooling fans associated with the PSM.
PSM - AC Input	Status of the AC input for the specified component
PSM - AC Output	Status of the AC output for the specified component.
PSM - DC input	Status of the DC input for the specified component.
PSM - DC output	Status of the DC output for the specified component.
PSM-Health check status	Reason for the health check failure of the PSM.
PSM - Hours Used	Number of hours the PSM has been operational.
PSM - Firmware Version	Version level of the firmware running on the PSM.

## Sample Output

### show chassis environment pdu (PTX5000)

```
user@host> show chassis environment pdu 0
```

```
PDU 0 status:
  State                Online
  Hours Used           4281
  Firmware Version (MCU1) 00.02
  Firmware Version (MCU2) 00.02
  Firmware Version (MCU3) 00.02
  Firmware Version (MCU4) 00.02
```

```

PDU 0 PSM 0 status:
  State           Online
  Temperature     OK    32 degrees C / 89 degrees F
  Fans            OK
  DC Input        OK
  DC Output       OK
  Hours Used      2864
  Firmware Version 00.04
PDU 0 PSM 1 status:
  State           Online
  Temperature     OK    30 degrees C / 86 degrees F
  Fans            OK
  DC Input        OK
  DC Output       OK
  Hours Used      3540
  Firmware Version 00.04
PDU 0 PSM 2 status:
  State           Online
  Temperature     OK    29 degrees C / 84 degrees F
  Fans            OK
  DC Input        OK
  DC Output       OK
  Hours Used      3711
  Firmware Version 00.04
PDU 0 PSM 3 status:
  State           Online
  Temperature     OK    29 degrees C / 84 degrees F
  Fans            OK
  DC Input        OK
  DC Output       OK
  Hours Used      4243
  Firmware Version 00.04

```

### show chassis environment pdu (PTX5000 Packet Transport Router with DC PSM and PDU)

```

user@host> show chassis environment pdu 1

PDU 1 status:
  State           Online
  BoostConv       OK
  Hours Used      1054
  Firmware Version (MCU1) 03.05
PDU 1 PSM 0 status:
  State           Empty
PDU 1 PSM 1 status:
  State           Online
  Temperature     OK    45 degrees C / 113 degrees F
  Fans            OK
  DC Input        OK
  DC Output       OK
  Hours Used      1027
  Firmware Version 03.07
PDU 1 PSM 2 status:
  State           Empty
PDU 1 PSM 3 status:
  State           Online
  Temperature     OK    43 degrees C / 109 degrees F
  Fans            OK
  DC Input        OK
  DC Output       OK

```

```

Hours Used          1029
Firmware Version    03.07
PDU 1 PSM 4 status:
State               Empty
PDU 1 PSM 5 status:
State               Online
Temperature         OK    46 degrees C / 114 degrees F
Fans                OK
DC Input            OK
DC Output           OK
Hours Used          1028
Firmware Version    03.07
PDU 1 PSM 6 status:
State               Empty
PDU 1 PSM 7 status:
State               Online
Temperature         OK    46 degrees C / 114 degrees F
Fans                OK
DC Input            OK
DC Output           OK
Hours Used          1030
Firmware Version    03.07

```

#### show chassis environment pdu (PTX5000 Packet Transport Router with AC PSM and PDU)

```
user@host> show chassis environment pdu 0
```

```

PDU 0 status:
State               Online
BoostConv           OK
Feed Switch         150 Amps
Hours Used          177
Firmware Version (MCU1) 03.04
Firmware Version (MCU2) 03.02
Firmware Version (MCU3) 03.02
Firmware Version (MCU4) 03.02
Firmware Version (MCU5) 03.02
Firmware Version (MCU6) 03.02
Firmware Version (MCU7) 03.02
Firmware Version (MCU8) 03.02
PDU 0 PSM 0 status:
State               Online
Temperature         OK    28 degrees C / 82 degrees F
Fans                OK
AC Input            OK
DC Output           OK
Hours Used          652
Firmware Version    01.01

```

#### show chassis environment pdu (PTX5000 Packet Transport Router after a health check failure on a PSM)

```
user@host> show chassis environment pdu 0
```

```

PDU 0 status:
State               Online
BoostConv           OK
Feed Switch         20 Amps
Hours Used          16706
Firmware Version (MCU1) 91.02

```

```

Firmware Version (MCU2)    03.02
Firmware Version (MCU3)    03.02
Firmware Version (MCU4)    03.02
Firmware Version (MCU5)    03.02
Firmware Version (MCU6)    03.02
Firmware Version (MCU7)    03.02
Firmware Version (MCU8)    03.02
PDU 0 PSM 0 status:
  State                     Online
  Temperature               OK    29 degrees C / 84 degrees F
  Fans                     OK
  AC Input                  OK
  DC Output                 OK
  Hours Used                9847
  Firmware Version          01.01
PDU 0 PSM 1 status:
  State                     Online
  Temperature               OK    29 degrees C / 84 degrees F
  Fans                     OK
  AC Input                  OK
  DC Output                 OK
  Hours Used                5586
  Firmware Version          01.01
PDU 0 PSM 2 status:
  State                     Online
  Temperature               OK    28 degrees C / 82 degrees F
  Fans                     OK
  AC Input                  OK
  DC Output                 OK
  Hours Used                10425
  Firmware Version          01.01
PDU 0 PSM 3 status:
  State                     Online
  Temperature               OK    28 degrees C / 82 degrees F
  Fans                     OK
  AC Input                  OK
  DC Output                 OK
  Hours Used                9912
  Firmware Version          01.01
PDU 0 PSM 4 status:
  State                     Empty
PDU 0 PSM 5 status:
  State                     Empty
PDU 0 PSM 6 status:
  State                     Present
  Temperature               OK    32 degrees C / 89 degrees F
  Fans                     OK
  AC Input                  OK
  DC Output                 OK
  Health check status       Failed, PSM set to NOT OK
  Hours Used                5770
  Firmware Version          01.01
PDU 0 PSM 7 status:
  State                     Online
  Temperature               OK    33 degrees C / 91 degrees F
  Fans                     OK
  AC Input                  OK
  DC Output                 OK
  Hours Used                20167
  Firmware Version          01.01

```



## show chassis environment pem

**List of Syntax**    [Syntax on page 1213](#)  
                           [Syntax \(ACX4000 Router\) on page 1213](#)  
                           [Syntax \(TX Matrix Routers\) on page 1213](#)  
                           [Syntax \(TX Matrix Plus Routers\) on page 1213](#)  
                           [Syntax \(MX Series Router\) on page 1213](#)  
                           [Syntax \(PTX Series Router\) on page 1213](#)  
                           [Syntax \(MX104 Universal Routing Platforms\) on page 1213](#)  
                           [Syntax \(MX10003, MX204, and MX10008 Universal Routing Platforms\) on page 1214](#)  
                           [Syntax \(QFX Series\) on page 1214](#)  
                           [Syntax \(OCX Series\) on page 1214](#)  
                           [Syntax \(EX9251, EX9253 Switches\) on page 1214](#)

**Syntax**    show chassis environment pem  
                   <slot>

**Syntax (ACX4000 Router)**    show chassis environment pem

**Syntax (TX Matrix Routers)**    show chassis environment pem  
   <lcc number | scc>  
   <slot>

**Syntax (TX Matrix Plus Routers)**    show chassis environment pem  
   <lcc number | sfc number>  
   <slot>

**Syntax (MX Series Router)**    show chassis environment pem  
   <slot>  
   <all-members>  
   <local>  
   <member member-id>

**Syntax (PTX Series Router)**    show chassis environment pem  
   <slot>  
   <all-members>  
   <local>  
   <member member-id>

**Syntax (MX104 Universal Routing Platforms)**    show chassis environment pem  
   <slot>  
   <satellite [fpc-slot slot-id | device-alias alias-name]

**Syntax (MX10003 ,  
MX204, and MX10008  
Universal Routing  
Platforms)**

```
show chassis environment pem
<slot>
```

**Syntax (QFX Series)**

```
show chassis environment pem
<slot (interconnect-device name slot ) | (node-device name)>
```

**Syntax (OCX Series)**

```
show chassis environment pem
<slot>
```

**Syntax (EX9251,  
EX9253 Switches)**

```
show chassis environment pem
<slot>
```

**Release Information**

Command introduced before Junos OS Release 7.4.  
 Command introduced in Junos OS Release 11.3 for the QFX Series.  
 Command introduced in Junos OS Release 12.3R2 for EX Series.  
 Command introduced in Junos OS Release 13.2 for MX104 Universal Routing Platforms.  
 Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.  
**satellite** option introduced in Junos OS Release 14.2R3.  
 Command introduced in Junos OS Release 17.2 for PTX10008 Routers.  
 Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.  
 Command introduced in Junos OS Release 17.4 for MX204 Universal Routing Platforms.  
 Command introduced in Junos OS Release 17.3 for MX150 Router Appliance.  
 Command introduced in Junos OS Release 18.1R1 for EX9251 Switches.  
 Command introduced in Junos OS Release 18.2 for EX9253 Switches.  
 Command introduced in Junos OS Release 18.2R1 for MX10008 Routers

**Description**

Display Power Entry Module (PEM) environmental status information.



**NOTE:** The new high-capacity (4100W) enhanced DC PEM on MX960 routers includes a new design that can condition the input voltage. This results in the output voltage differing from the input voltage. The earlier generation of DC PEMs coupled the input power directly to the output, thereby making it safe to assume that the output voltage was equal to the input voltage.

**Options**

**none**—Display environmental information about both PEMs. For the TX Matrix router, display environmental information about the PEMs, the TX Matrix router, and its attached T640 routers. For the TX Matrix Plus router, display environmental information about the PEMs, the TX Matrix Plus router, and its attached routers.

**all-members**—(MX Series routers only) (Optional) Display environmental information about the PEMs in all the member routers of the Virtual Chassis configuration.



**interconnect-device *name***—(QFabric systems only) (Optional) Display chassis environmental information about the PEMs in the Interconnect device.

**lcc *number***—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers only) (Optional) Display environmental information about the PEM in the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Display environmental information about the PEM in the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

**node-device *name***—(QFabric systems only) (Optional) Display chassis environmental information about the PEMs in the Node device.

**satellite [*fpc-slot slot-id* | device-alias *alias-name*]**—(Junos Fusion only)(Optional) Display environmental information about the PEM in the specified satellite device in a Junos Fusion, or for all satellite devices in the Junos Fusion if no satellite devices are specified.

**scc**—(TX Matrix routers only) (Optional) Display environmental information about the PEM in the TX Matrix router (or switch-card chassis).

**sfc**—(TX Matrix Plus routers only) (Optional) Display environmental information about the PEM in the TX Matrix Plus router (or switch-fabric chassis).

**slot** —(Optional) Display environmental information about an individual PEM. Replace *slot* with 0 or 1.

**Required Privilege Level**

view

**Related Documentation**

- [show chassis hardware on page 1726](#)

**List of Sample Output**

[show chassis environment pem \(M40e Router\) on page 1217](#)  
[show chassis environment pem \(M120 Router\) on page 1217](#)

[show chassis environment pem \(M160 Router\) on page 1218](#)  
[show chassis environment pem \(M320 Router\) on page 1218](#)  
[show chassis environment pem \(MX150\) on page 1218](#)  
[show chassis environment pem \(MX104 Router\) on page 1218](#)  
[show chassis environment pem \(MX240 Router\) on page 1219](#)  
[show chassis environment pem \(MX480 Router\) on page 1219](#)  
[show chassis environment pem \(MX960 Router\) on page 1219](#)  
[show chassis environment pem \(MX10003 Router\) on page 1219](#)  
[show chassis environment pem \(MX204 Router\) on page 1220](#)  
[show chassis environment pem \(MX10008 Router\) on page 1220](#)  
[show chassis environment pem \(PTX10016 Router\) on page 1221](#)  
[show chassis environment pem \(T320 Router\) on page 1222](#)  
[show chassis environment pem \(T640 Router\) on page 1222](#)  
[show chassis environment pem \(T4000 Router\) on page 1222](#)  
[show chassis environment pem \(T640/T1600/T4000 Routers With Six-Input DC Power Supply\) on page 1223](#)  
[show chassis environment pem lcc \(TX Matrix Routing Matrix\) on page 1223](#)  
[show chassis environment pem scc \(TX Matrix Routing Matrix\) on page 1224](#)  
[show chassis environment pem sfc \(TX Matrix Plus Routing Matrix\) on page 1224](#)  
[show chassis environment pem lcc \(TX Matrix Plus Routing Matrix\) on page 1224](#)  
[show chassis environment pem node-device \(QFabric System\) on page 1225](#)  
[show chassis environment pem \(QFX Series and OCX Series\) on page 1225](#)  
[show chassis environment pem interconnect-device \(QFabric System\) on page 1225](#)  
[show chassis environment pem \(EX9251 Switches\) on page 1226](#)  
[show chassis environment pem \(EX9253 Switches\) on page 1226](#)

**Output Fields** [Table 109 on page 1216](#) lists the output fields for the **show chassis environment pem** command. Output fields are listed in the approximate order in which they appear.

*Table 109: show chassis environment pem Output Fields*

Field Name	Field Description
PEMslotstatus	Number of the PEM slot.
State	Status of the PEM.
Temperature	Temperature of the air flowing past the PEM.
AC Input	Status of the AC input for the specified component
AC Output	Status of the AC output for the specified component.
DC input	Status of the DC input for the specified component.
DC output	Status of the DC output for the specified component.
Load	(Not available on M40e or M160 routers) Information about the load on supply, in percentage of rated current being used.

Table 109: show chassis environment pem Output Fields (continued)

Field Name	Field Description
Voltage	(M120, M160, M320, T640, T1600, TX Matrix, and TX Matrix Plus routers only) Information about voltage supplied to the PEM.  (MX104 routers only) Information about voltage supplied by the PEM to the system.
Current	(T640, T1600, TX Matrix, and TX Matrix Plus routers only) Information about the PEM current.
Power	(T640, T1600, TX Matrix, and TX Matrix Plus routers only) Information about the PEM power.
SCG/CB/SIB	(T640, T1600, TX Matrix, and TX Matrix Plus routers only) SONET Clock Generator/Control Board/Switch Interface Board.
FAN	(T640, T1600, and T4000 routers with six-input DC power supply only) Information about the DC output to the fan.

## Sample Output

### show chassis environment pem (M40e Router)

```
user@host> show chassis environment pem
```

```

PEM 0 status:
  State           Online
  Temperature      OK
  AC input         OK
  DC output        OK

```

### show chassis environment pem (M120 Router)

```
user@host> show chassis environment pem
```

```

PEM 0 status:
  State           Online
  Temperature      OK
  DC Input:        OK
  DC Output:       OK
  Load            Less than 20 percent
  Voltage:
    48.0 V input   52864 mV
    48.0 V fan supply 41655 mV
    3.3 V          3399 mV
PEM 1 status:
  State           Online
  Temperature      OK
  DC Input:        OK
  DC Output:       OK
  Load            Less than 20 percent
  Voltage:
    48.0 V input   54537 mV
    48.0 V fan supply 42910 mV
    3.3 V          3506 mV

```

### show chassis environment pem (M160 Router)

```
user@host> show chassis environment pem
```

```
PEM 0 status:
  State           Online
  Temperature      OK
  DC input         OK
  DC output        OK
  Load            Less than 20 percent
  Voltage:
    48.0 V input   54833 mV
    48.0 V fan supply 50549 mV
    8.0 V bias     8239 mV
    5.0 V bias     5006 mV
```

### show chassis environment pem (M320 Router)

```
user@host> show chassis environment pem
```

```
PEM 2 status:
  State           Online
  Temperature      OK
  DC input         OK
  Load            Less than 40 percent
    48.0 V input   51853 mV
    48.0 V fan supply 48877 mV
    8.0 V bias     8449 mV
    5.0 V bias     4998 mV
PEM 3 status:
  State           Online
  Temperature      OK
  DC input         OK
  Load            Less than 40 percent
    48.0 V input   51717 mV
    48.0 V fan supply 49076 mV
    8.0 V bias     8442 mV
    5.0 V bias     4998 mV
```

### show chassis environment pem (MX150)

```
user@host> show chassis environment pem
```

```
FPC 0 PEM 0 status:
  State           Online
  Airflow          Front to Back
  Temperature      OK
```

### show chassis environment pem (MX104 Router)

```
user@host> show chassis environment pem
```

```
PEM 0 status:
  State           Online
  Temperature      OK
  DC Output:       OK
  Voltage:
    12.0 V output   12281 mV
    3.3 V output    3353 mV
```

```

PEM 1 status:
  State          Empty

```

#### show chassis environment pem (MX240 Router)

```
user@host> show chassis environment pem
```

```

PEM 0 status:
  State          Online
  Temperature     OK
  DC Output:     OK
PEM 1 status:
  State          Online
  Temperature     OK
  DC Output:     OK

```

#### show chassis environment pem (MX480 Router)

```
user@host> show chassis environment pem
```

```

PEM 0 status:
  State          Online
  Temperature     OK
  DC Input:      OK
  DC Output:     OK
  Voltage:
PEM 1 status:
  State          Online
  Temperature     OK
  DC Input:      OK
  DC Output:     OK
  Voltage:

```

#### show chassis environment pem (MX960 Router)

```
user@host> show chassis environment pem
```

```

PEM 2 status:
  State          Present
PEM 3 status:
  State          Online
  Temperature     OK
  DC Output:     OK

```

#### show chassis environment pem (MX10003 Router)

```
user@host> show chassis environment pem
```

```

PEM 0 status:
  State          Online
  Airflow        Front to Back
  Temperature     OK   34 degrees C / 93 degrees F
  Temperature     OK   26 degrees C / 78 degrees F
  Temperature     OK   24 degrees C / 75 degrees F
  Firmware version 0x22
  Cooling Fan     8752 RPM
  DC Output       Voltage(V) Current(A) Power(W) Load(%)
                  12.00      26          312      10

```

```

PEM 1 status:
  State          Online
  Airflow        Front to Back
  Temperature    OK   35 degrees C / 95 degrees F
  Temperature    OK   26 degrees C / 78 degrees F
  Temperature    OK   25 degrees C / 77 degrees F
  Firmware version 0x22
  Cooling Fan    8480 RPM
  DC Output      Voltage(V) Current(A) Power(W) Load(%)
                  12.00      27          324      11
PEM 2 status:
  State          Online
  Airflow        Front to Back
  Temperature    OK   37 degrees C / 98 degrees F
  Temperature    OK   29 degrees C / 84 degrees F
  Temperature    OK   25 degrees C / 77 degrees F
  Firmware version 0x22
  Cooling Fan    8656 RPM
  DC Output      Voltage(V) Current(A) Power(W) Load(%)
                  12.00      25          300      10
PEM 3 status:
  State          Online
  Airflow        Front to Back
  Temperature    OK   35 degrees C / 95 degrees F
  Temperature    OK   26 degrees C / 78 degrees F
  Temperature    OK   25 degrees C / 77 degrees F
  Firmware version 0x22
  Cooling Fan    8448 RPM
  DC Output      Voltage(V) Current(A) Power(W) Load(%)
                  12.00      26          312      10
PEM 4 status:
  State          Empty
PEM 5 status:
  State          Empty

```

### show chassis environment pem (MX204 Router)

```
user@host> show chassis environment pem
```

```

PEM 0 status:
  State          Empty
PEM 1 status:
  State          Online
  Airflow        Front to Back
  Temperature    OK   48 degrees C / 118 degrees F
  Temperature    OK   51 degrees C / 123 degrees F
  Fan Sensor     5400 RPM
  DC Output      Voltage(V) Current(A) Power(W) Load(%)
                  11.94      16          191      29

```

### show chassis environment pem (MX10008 Router)

```
user@host> show chassis environment pem
```

```

PEM 0 status:
  State          Online
  Airflow        Front to Back
  Temperature    OK   29 degrees C / 84 degrees F

```

```

Firmware version      0x36
Fan 0                  5880 RPM
DC Output              Voltage(V) Current(A) Power(W) Load(%)
                      12.00      104      1248      46
PEM 1 status:
  State                Online
  Airflow              Front to Back
  Temperature          OK    27 degrees C / 80 degrees F
  Firmware version     0x36
  Fan 0                5940 RPM
  DC Output            Voltage(V) Current(A) Power(W) Load(%)
                      12.00      104      1248      46
PEM 2 status:
  State                Online
  Airflow              Front to Back
  Temperature          OK    30 degrees C / 86 degrees F
  Firmware version     0x36
  Fan 0                5940 RPM
  DC Output            Voltage(V) Current(A) Power(W) Load(%)
                      12.00      105      1260      46
PEM 3 status:
  State                Present
PEM 4 status:
  State                Present
PEM 5 status:
  State                Present

```

### show chassis environment pem (PTX10016 Router)

```

user@host> show chassis environment pem
PEM 0 status:
  State                Online
  Airflow              Front to Back
  Temperature          OK    21 degrees C / 69 degrees F
  Firmware version     0x36
  Fan 0                5760 RPM
  DC Output            Voltage(V) Current(A) Power(W) Load(%)
                      12.00      51      612      22
PEM 1 status:
  State                Online
  Airflow              Front to Back
  Temperature          OK    23 degrees C / 73 degrees F
  Firmware version     0x36
  Fan 0                5760 RPM
  DC Output            Voltage(V) Current(A) Power(W) Load(%)
                      12.00      52      624      23
PEM 2 status:
  State                Online
  Airflow              Front to Back
  Temperature          OK    23 degrees C / 73 degrees F
  Firmware version     0x36
  Fan 0                5760 RPM
  DC Output            Voltage(V) Current(A) Power(W) Load(%)
                      12.00      51      612      22
PEM 3 status:
  State                Online
  Airflow              Front to Back
  Temperature          OK    21 degrees C / 69 degrees F
  Firmware version     0x36

```

```

Fan 0                    5760 RPM
DC Output                Voltage(V) Current(A) Power(W) Load(%)
                        12.00      51          612      22
PEM 4 status:
State                    Online
Airflow                  Front to Back
Temperature              OK    22 degrees C / 71 degrees F
Firmware version         0x36
Fan 0                    5760 RPM
DC Output                Voltage(V) Current(A) Power(W) Load(%)
                        12.00      52          624      23
PEM 5 status:
State                    Online
Airflow                  Front to Back
Temperature              OK    24 degrees C / 75 degrees F
Firmware version         0x36
Fan 0                    5700 RPM
DC Output                Voltage(V) Current(A) Power(W) Load(%)
                        12.00      51          612      22
PEM 6 status:
State                    Online
Airflow                  Front to Back
Temperature              OK    21 degrees C / 69 degrees F
Firmware version         0x36
Fan 0                    5700 RPM
DC Output                Voltage(V) Current(A) Power(W) Load(%)
                        12.00      50          600      22

```

#### show chassis environment pem (T320 Router)

```
user@host> show chassis environment pem
```

```

PEM 0 status:
State                    Online
Temperature              OK
DC input:               OK

```

#### show chassis environment pem (T640 Router)

```
user@host> show chassis environment pem
```

```

PEM 0 status:
State                    Online
Temperature              22 degrees C / 71 degrees F
AC input: OK
DC output:              Voltage    Current      Power      Load
FPC 0                   56875      606         34         4
FPC 1                   57016      525         29         3
FPC 2                    0           0           0           0
FPC 3                    0           0           0           0
FPC 4                    0           0           0           0
FPC 5                    0           0           0           0
FPC 6                   57158     1581        90         12
FPC 7                    0           0           0           0
SCG/CB/SIB              56750     1125        63         5

```

#### show chassis environment pem (T4000 Router)

```
user@host> show chassis environment pem
```



```

PEM 0 status:
State                Online
Temperature          33 degrees C / 91 degrees F
DC Input:           OK
                    Voltage(V) Current(A) Power(W) Load(%)
INPUT 0              54.625      9.812      535      22
INPUT 1              54.625     10.250      559      23
INPUT 2              55.125       0.125        6       0
INPUT 3              54.500     10.062      548      22
INPUT 4              54.750       9.375      513      21
INPUT 5              54.750     10.187      557      23
DC Output            Voltage(V) Current(A) Power(W) Load(%)
FPC 0                55.750     10.125      564      37
FPC 1                51.625       0.000        0       0
FPC 2                52.000       0.000        0       0
FPC 3                55.062     10.437      574      38
FPC 4                52.125       0.000        0       0
FPC 5                55.000       9.375      515      34
FPC 6                55.187       9.687      534      35
FPC 7                51.437       0.000        0       0
SCG/CB/SIB           55.375     15.750      872      35
FAN                  54.562     14.750      804      42

```

#### show chassis environment pem (T640/T1600/T4000 Routers With Six-Input DC Power Supply)

```
user@host> show chassis environment pem
```

```

PEM 1 status:
State                Online
Temperature          36 degrees C / 96 degrees F
DC Input:           OK
                    Voltage(V) Current(A) Power(W) Load(%)
INPUT 0              0.000      0.000        0       0
INPUT 1              54.875      3.812      209      27
INPUT 2              55.375      3.937      218      29
INPUT 3              54.625      3.750      204      27
INPUT 4              55.125      3.375      186      24
INPUT 5              55.125      3.375      186      24
DC Output            Voltage(V) Current(A) Power(W) Load(%)
FPC 0                52.312      0.000        0       0
FPC 1                52.687      0.000        0       0
FPC 2                52.812      0.000        0       0
FPC 3                55.812      7.062      394      52
FPC 4                52.625      0.000        0       0
FPC 5                52.625      0.000        0       0
FPC 6                52.750      0.000        0       0
FPC 7                52.750      0.000        0       0
SCG/CB/SIB           55.937     11.937      667      55
FAN                  55.812      4.937      275      36

```

#### show chassis environment pem lcc (TX Matrix Routing Matrix)

```
user@host> show chassis environment pem 0 lcc 0
```

```
lcc0-re0:
```

```

-----
PEM 0 status:
State                Present
Temperature          27 degrees C / 80 degrees F

```

DC input:		Check		
DC output:	Voltage	Current	Power	Load
FPC 0	0	0	0	0
FPC 1	0	0	0	0
FPC 2	0	0	0	0
FPC 3	0	0	0	0
FPC 4	0	0	0	0
FPC 5	0	0	0	0
FPC 6	0	0	0	0
FPC 7	0	0	0	0
SCG/CB/SIB	0	0	0	0

### show chassis environment pem scc (TX Matrix Routing Matrix)

```
user@host> show chassis environment pem scc
```

```
scc-re0:
```

```
-----
```

```
PEM 1 status:
```

State	Online			
Temperature	24 degrees C / 75 degrees F			
DC input:	OK			
DC output:	Voltage	Current	Power	Load
SIB 0	0	0	0	0
SIB 1	0	0	0	0
SIB 2	0	0	0	0
SIB 3	56550	0	0	0
SIB 4	55958	6912	386	51

### show chassis environment pem sfc (TX Matrix Plus Routing Matrix)

```
user@host> show chassis environment pem sfc 0
```

```
sfc0-re0:
```

```
-----
```

```
PEM 0 status:
```

State	Online			
Temperature	35 degrees C / 95 degrees F			
DC Input:	OK			
DC Output	Voltage	Current	Power	Load
Channel 0	53820	14140	761	59
Channel 1	53550	12720	681	53
Channel 2	53840	12930	696	54
Channel 3	53690	14990	804	63
Channel 4	53620	15070	808	63
Channel 5	53900	14820	798	62
Channel 6	54120	5020	271	21

### show chassis environment pem lcc (TX Matrix Plus Routing Matrix)

```
user@host> show chassis environment lcc 0
```

```
lcc0-re1:
```

```
-----
```

```
PEM 0 status:
```

State	Online
Temperature	38 degrees C / 100 degrees F
DC Input:	OK

```

DC Output      Voltage    Current    Power    Load
FPC 0          0          0          0        0
FPC 1          0          0          0        0
FPC 2          0          0          0        0
FPC 3          0          0          0        0
FPC 4          56408      7575      427      56
FPC 5          0          0          0        0
FPC 6          56266      7956      447      59
FPC 7          56283      6100      343      45
SCG/CB/SIB     55916      8950      500      41

```

PEM 1 status:

```

State          Present
Temperature     35 degrees C / 95 degrees F
DC Input:       Check

```

DC Output	Voltage	Current	Power	Load
FPC 0	0	0	0	0
FPC 1	0	0	0	0
FPC 2	0	0	0	0
FPC 3	0	0	0	0
FPC 4	0	0	0	0
FPC 5	0	0	0	0
FPC 6	0	0	0	0
FPC 7	0	0	0	0
SCG/CB/SIB	0	0	0	0

#### show chassis environment pem node-device (QFabric System)

```

user@switch> show chassis environment pem node-device node1

```

FPC 0 PEM 0 status:

```

State          Check
Airflow        Front to Back
Temperature     OK
AC Input:      OK
DC Output      Voltage(V) Current(A) Power(W) Load(%)
                12          10        120      18

```

FPC 0 PEM 1 status:

```

State          Online
Airflow        Back to Front
Temperature     OK
AC Input:      OK
DC Output      Voltage(V) Current(A) Power(W) Load(%)
                11          10        110      17

```

#### show chassis environment pem (QFX Series and OCX Series)

```

user@switch> show chassis environment pem

```

FPC 0 PEM 1 status:

```

State          Online
Airflow        Front to Back
Temperature     OK
AC Input:      OK
DC Output      Voltage(V) Current(A) Power(W) Load(%)
                12          17        204      31

```

#### show chassis environment pem interconnect-device (QFabric System)

```

user@switch> show chassis environment pem interconnect-device IC11

```

```

IC1 PEM 1 status:
  State                Online
  Airflow              Front to Back
  Temperature          OK
  AC Input:            OK
  DC Output            Voltage(V) Current(A) Power(W) Load(%)
                      12          18       216    33

```

### show chassis environment pem (EX9251 Switches)

```

user@switch> show chassis environment pem

PEM 0 status:
  State                Present
PEM 1 status:
  State                Online
  Airflow              Front to Back
  Temperature          OK   36 degrees C / 96 degrees F
  Temperature          OK   35 degrees C / 95 degrees F
  Fan Sensor           5940 RPM
  DC Output            Voltage(V) Current(A) Power(W) Load(%)
                      11.85      17       201    30

```

### show chassis environment pem (EX9253 Switches)

```

user@switch> show chassis environment pem

PEM 0 status:
  State                Online
  Airflow              Front to Back
  Temperature          OK   56 degrees C / 132 degrees F
  Temperature          OK   46 degrees C / 114 degrees F
  Temperature          OK   28 degrees C / 82 degrees F
  Firmware version      04.10
  Cooling Fan           9056 RPM
  DC Output            Voltage(V) Current(A) Power(W) Load(%)
                      12.00      47       564    19
PEM 1 status:
  State                Present
PEM 2 status:
  State                Empty
PEM 3 status:
  State                Empty
PEM 4 status:
  State                Present
PEM 5 status:
  State                Online
  Airflow              Front to Back
  Temperature          OK   61 degrees C / 141 degrees F
  Temperature          OK   49 degrees C / 120 degrees F
  Temperature          OK   28 degrees C / 82 degrees F
  Firmware version      04.10
  Cooling Fan           8656 RPM
  DC Output            Voltage(V) Current(A) Power(W) Load(%)
                      12.00      51       612    21

```

## show chassis environment psu

<b>Syntax</b>	<b>show chassis environment psu</b> <b>&lt;slot-number&gt;</b>
<b>Release Information</b>	Command introduced in Junos OS Release 10.3 for EX Series switches.
<b>Description</b>	(On EX8200 switches only) Display the state of the power supply.
<b>Options</b>	<b>none</b> —Display the state of the power supply for all power supplies.  <b>slot-number</b> —(Optional) Display the state of the power supply for a specific power supply slot number (0–5).
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <i>Verifying Power Configuration and Use</i></li> <li>• <i>show chassis power-budget-statistics</i></li> </ul>
<b>List of Sample Output</b>	<a href="#">show chassis environment psu on page 1227</a> <a href="#">show chassis environment psu (for PSU 1) on page 1228</a>
<b>Output Fields</b>	Table 110 on page 1227 lists the output fields for the <b>show chassis environment psu</b> command. Output fields are listed in the approximate order in which they appear.

Table 110: show chassis environment psu Output Fields

Field Name	Field Description
<b>State</b>	State of the power supply: Online, Offline, or Empty.
<b>Temperature</b>	Temperature for the online power supply: OK or Out of Range.
<b>DC Output</b>	DC output for the online power supply: OK or Out of Range.

## Sample Output

### show chassis environment psu

```
user@switch> show chassis environment psu
```

```
PSU 0 status:
  State                Offline
PSU 1 status:
  State                Online
```

Temperature	OK
DC Output:	OK
PSU 2 status:	
State	Online
Temperature	OK
DC Output:	OK
PSU 3 status:	
State	Offline
PSU 4 status:	
State	Offline
PSU 5 status:	
State	Offline

#### show chassis environment psu (for PSU 1)

```
user@switch> show chassis environment psu 1
```

PSU 1 status:	
State	Online
Temperature	OK
DC Output:	OK

## show chassis environment psm

<b>Syntax</b>	<pre>show chassis environment psm &lt;all-members&gt; &lt;local&gt; &lt;member <i>member-id</i>&gt; &lt;psm-slot-number&gt;</pre>
<b>Release Information</b>	<p>Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.</p> <p><b>all-members</b>, <b>local</b>, and <b>member <i>member-id</i></b> options introduced in Junos OS Release 15.1 for MX2020 and MX2010 routers.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p>
<b>Description</b>	Display chassis environmental information about the power supply module (PSM).
<b>Options</b>	<p><b>none</b>—Display environmental information about all power supply modules (PSMs).</p> <p><b>all-members</b>—(Optional) Display chassis environmental information about the PSM in all members of the Virtual Chassis configuration.</p> <p><b>local</b>—(Optional) Display chassis environmental information about the PSM in the local member of the Virtual Chassis.</p> <p><b>member <i>member-id</i></b>—(Optional) Display chassis environmental information about the PSM in the specified member of the Virtual Chassis. Replace <b><i>member-id</i></b> with the value 0 or 1.</p> <p><b><i>psm-slot-number</i></b>—(Optional) Display environmental information about the specified power supply module. For MX2020 routers, replace <b><i>psm-slot-number</i></b> with a value from 0 through 17. For MX2010 and MX2008 routers, replace <b><i>psm-slot-number</i></b> with a value from 0 through 8.</p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">show chassis environment on page 969</a></li> </ul>
<b>List of Sample Output</b>	<p><a href="#">show chassis environment psm (MX2020 Router) on page 1230</a></p> <p><a href="#">show chassis environment psm (MX2020 Router with 240-V high-voltage DC PSMs) on page 1232</a></p> <p><a href="#">show chassis environment psm (MX2010 Router) on page 1235</a></p> <p><a href="#">show chassis environment psm (MX2008 Router) on page 1236</a></p>
<b>Output Fields</b>	<p><a href="#">Table 111 on page 1230</a> lists the output fields for the <b>show chassis environment psm</b> command. Output fields are listed in the approximate order in which they appear.</p>

Table 111: show chassis environment psm Output Fields

Field Name	Field Description
<b>State</b>	Status of the PSM. <ul style="list-style-type: none"> <li>• <b>Online</b>—The PSM is online and running.</li> <li>• <b>Offline</b>—PSM is powered down.</li> </ul>
<b>Temperature</b>	The status of the temperature of the air flowing past the PSM. <ul style="list-style-type: none"> <li>• <b>Out of range</b>—Displayed if the PSM detects over-temperature.</li> <li>• <b>OK</b>—Displayed if the temperature is within the acceptable limit.</li> </ul>
<b>DC Input</b>	State of the DC input power feed for the specified zone at the specified amps and voltage, and load for the PSM.
<b>DC Output</b>	DC power output in watts (W) for the specified zone at the specified amps and voltage (A @ V), and load and percentage utilization of the maximum capacity for the PSM.
<b>Hours Used</b>	Number of hours the PSM has been operational.

## Sample Output

### show chassis environment psm (MX2020 Router)

```

user@host> show chassis environment psm

PSM 2 status:
  State      Online
  Temperature OK
  DC Input   Feed      Voltage(V) Current(A) Power(W)
              INP0      50.00      18.90    945.00
              INP1      0.00      0.00     0.00
  DC Output  Voltage(V) Current(A) Power(W) Load(%)
              51.75      16.50    853.88   40.66
  Hours Used 6140
PSM 3 status:
  State      Online
  Temperature OK
  DC Input   Feed      Voltage(V) Current(A) Power(W)
              INP0      50.40      18.90    952.56
              INP1      0.00      0.00     0.00
  DC Output  Voltage(V) Current(A) Power(W) Load(%)
              51.75      16.50    853.88   40.66
  Hours Used 6140
PSM 4 status:
  State      Online
  Temperature OK
  DC Input   Feed      Voltage(V) Current(A) Power(W)
              INP0      50.40      18.90    952.56
              INP1      0.00      0.00     0.00
  DC Output  Voltage(V) Current(A) Power(W) Load(%)
              52.00      16.75    871.00   41.48
  Hours Used 6140
PSM 5 status:
  State      Online

```



Temperature	OK				
DC Input	Feed	Voltage(V)	Current(A)	Power(W)	
	INP0	50.40	18.90	952.56	
	INP1	0.00	0.00	0.00	
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)	
	52.00	16.50	858.00	40.86	
Hours Used	6140				
PSM 6 status:					
State	Online				
Temperature	OK				
DC Input	Feed	Voltage(V)	Current(A)	Power(W)	
	INP0	50.40	18.90	952.56	
	INP1	0.00	0.00	0.00	
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)	
	52.00	16.75	871.00	41.48	
Hours Used	6140				
PSM 7 status:					
State	Online				
Temperature	OK				
DC Input	Feed	Voltage(V)	Current(A)	Power(W)	
	INP0	50.40	19.20	967.68	
	INP1	0.00	0.00	0.00	
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)	
	52.00	16.75	871.00	41.48	
Hours Used	6140				
PSM 8 status:					
State	Online				
Temperature	OK				
DC Input	Feed	Voltage(V)	Current(A)	Power(W)	
	INP0	50.00	20.40	1020.00	
	INP1	0.00	0.00	0.00	
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)	
	51.75	17.00	879.75	41.89	
Hours Used	3380				
PSM 11 status:					
State	Online				
Temperature	OK				
DC Input	Feed	Voltage(V)	Current(A)	Power(W)	
	INP0	0.00	0.00	0.00	
	INP1	50.40	18.30	922.32	
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)	
	52.00	16.25	845.00	40.24	
Hours Used	5615				
PSM 12 status:					
State	Online				
Temperature	OK				
DC Input	Feed	Voltage(V)	Current(A)	Power(W)	
	INP0	0.00	0.00	0.00	
	INP1	50.40	18.30	922.32	
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)	
	52.00	16.00	832.00	39.62	
Hours Used	6143				
PSM 13 status:					
State	Online				
Temperature	OK				
DC Input	Feed	Voltage(V)	Current(A)	Power(W)	
	INP0	0.00	0.00	0.00	
	INP1	50.40	18.00	907.20	
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)	
	52.00	16.00	832.00	39.62	

```

Hours Used          6143
PSM 14 status:
State               Online
Temperature         OK
DC Input            Feed      Voltage(V)  Current(A)  Power(W)
                   INP0       0.00        0.00        0.00
                   INP1       50.00       18.30      915.00
DC Output           Voltage(V)  Current(A)  Power(W)  Load(%)
                   52.00       16.00      832.00    39.62
Hours Used          6143
PSM 15 status:
State               Online
Temperature         OK
DC Input            Feed      Voltage(V)  Current(A)  Power(W)
                   INP0       0.00        0.00        0.00
                   INP1       48.80       18.90      922.32
DC Output           Voltage(V)  Current(A)  Power(W)  Load(%)
                   52.00       16.25      845.00    40.24
Hours Used          6143
PSM 16 status:
State               Online
Temperature         OK
DC Input            Feed      Voltage(V)  Current(A)  Power(W)
                   INP0       0.00        0.00        0.00
                   INP1       48.80       18.90      922.32
DC Output           Voltage(V)  Current(A)  Power(W)  Load(%)
                   52.00       16.25      845.00    40.24
Hours Used          6143
PSM 17 status:
State               Online
Temperature         OK
DC Input            Feed      Voltage(V)  Current(A)  Power(W)
                   INP0       0.00        0.00        0.00
                   INP1       48.80       18.90      922.32
DC Output           Voltage(V)  Current(A)  Power(W)  Load(%)
                   52.00       16.25      845.00    40.24
Hours Used          5207

```

### show chassis environment psm (MX2020 Router with 240-V high-voltage DC PSMs)

```
user@host> show chassis environment psm
```

```

PSM 0 status:
State               Online
Temperature         OK
DC Input            Feed      Voltage(V)  Current(A)  Power(W)
                   INP0       0.00        0.00        0.00
                   INP1       240.00       1.00      240.00
DC Output           Voltage(V)  Current(A)  Power(W)  Load(%)
                   52.75       3.75      197.81    7.91
Hours Used          2026
PSM 1 status:
State               Online
Temperature         OK
DC Input            Feed      Voltage(V)  Current(A)  Power(W)
                   INP0       0.00        0.00        0.00
                   INP1       240.00       0.90      216.00
DC Output           Voltage(V)  Current(A)  Power(W)  Load(%)
                   52.75       3.25      171.44    6.86

```

```

Hours Used                2530
PSM 2 status:
State                     Online
Temperature               OK
DC Input                  Feed      Voltage(V)  Current(A)  Power(W)
                        INP0       0.00       0.00       0.00
                        INP1       240.00     0.90       216.00
DC Output                 Voltage(V) Current(A)  Power(W)  Load(%)
                        52.75      3.50      184.62    7.38
Hours Used                2530
PSM 3 status:
State                     Online
Temperature               OK
DC Input                  Feed      Voltage(V)  Current(A)  Power(W)
                        INP0       0.00       0.00       0.00
                        INP1       240.00     0.90       216.00
DC Output                 Voltage(V) Current(A)  Power(W)  Load(%)
                        52.75      3.50      184.62    7.38
Hours Used                2530
PSM 4 status:
State                     Online
Temperature               OK
DC Input                  Feed      Voltage(V)  Current(A)  Power(W)
                        INP0       0.00       0.00       0.00
                        INP1       240.00     0.90       216.00
DC Output                 Voltage(V) Current(A)  Power(W)  Load(%)
                        52.50      3.50      183.75    7.35
Hours Used                2530
PSM 5 status:
State                     Online
Temperature               OK
DC Input                  Feed      Voltage(V)  Current(A)  Power(W)
                        INP0       0.00       0.00       0.00
                        INP1       240.00     1.00       240.00
DC Output                 Voltage(V) Current(A)  Power(W)  Load(%)
                        52.50      3.75      196.88    7.88
Hours Used                2530
PSM 6 status:
State                     Online
Temperature               OK
DC Input                  Feed      Voltage(V)  Current(A)  Power(W)
                        INP0       0.00       0.00       0.00
                        INP1       240.00     1.00       240.00
DC Output                 Voltage(V) Current(A)  Power(W)  Load(%)
                        52.50      3.75      196.88    7.88
Hours Used                2002
PSM 7 status:
State                     Online
Temperature               OK
DC Input                  Feed      Voltage(V)  Current(A)  Power(W)
                        INP0       0.00       0.00       0.00
                        INP1       240.00     1.00       240.00
DC Output                 Voltage(V) Current(A)  Power(W)  Load(%)
                        52.50      3.75      196.88    7.88
Hours Used                2146
PSM 8 status:
State                     Online
Temperature               OK
DC Input                  Feed      Voltage(V)  Current(A)  Power(W)
                        INP0       0.00       0.00       0.00

```

DC Output	INP1	240.00	1.00	240.00
	Voltage(V)	Current(A)	Power(W)	Load(%)
	52.50	3.75	196.88	7.88
Hours Used	2026			
PSM 9 status:				
State	Online			
Temperature	OK			
DC Input	Feed	Voltage(V)	Current(A)	Power(W)
	INP0	240.00	0.80	192.00
	INP1	0.00	0.00	0.00
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)
	52.50	2.75	144.38	5.78
Hours Used	2530			
PSM 10 status:				
State	Online			
Temperature	OK			
DC Input	Feed	Voltage(V)	Current(A)	Power(W)
	INP0	240.00	0.80	192.00
	INP1	0.00	0.00	0.00
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)
	52.75	2.75	145.06	5.80
Hours Used	682			
PSM 11 status:				
State	Online			
Temperature	OK			
DC Input	Feed	Voltage(V)	Current(A)	Power(W)
	INP0	240.00	0.70	168.00
	INP1	0.00	0.00	0.00
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)
	52.75	2.75	145.06	5.80
Hours Used	2098			
PSM 12 status:				
State	Online			
Temperature	OK			
DC Input	Feed	Voltage(V)	Current(A)	Power(W)
	INP0	240.00	0.80	192.00
	INP1	0.00	0.00	0.00
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)
	52.25	3.00	156.75	6.27
Hours Used	2458			
PSM 13 status:				
State	Online			
Temperature	OK			
DC Input	Feed	Voltage(V)	Current(A)	Power(W)
	INP0	240.00	0.80	192.00
	INP1	0.00	0.00	0.00
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)
	52.25	2.75	143.69	5.75
Hours Used	2601			
PSM 14 status:				
State	Online			
Temperature	OK			
DC Input	Feed	Voltage(V)	Current(A)	Power(W)
	INP0	240.00	0.80	192.00
	INP1	0.00	0.00	0.00
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)
	52.75	2.75	145.06	5.80
Hours Used	682			
PSM 15 status:				
State	Online			

```

Temperature      OK
DC Input         Feed      Voltage(V) Current(A) Power(W)
                  INP0      240.00      0.80      192.00
                  INP1      0.00        0.00      0.00
DC Output         Voltage(V) Current(A) Power(W) Load(%)
                  52.25      2.75      143.69    5.75
Hours Used       2122
PSM 16 status:
State            Online
Temperature      OK
DC Input         Feed      Voltage(V) Current(A) Power(W)
                  INP0      240.00      0.70      168.00
                  INP1      0.00        0.00      0.00
DC Output         Voltage(V) Current(A) Power(W) Load(%)
                  52.25      2.50      130.62    5.22
Hours Used       2050
PSM 17 status:
State            Online
Temperature      OK
DC Input         Feed      Voltage(V) Current(A) Power(W)
                  INP0      240.00      0.80      192.00
                  INP1      0.00        0.00      0.00
DC Output         Voltage(V) Current(A) Power(W) Load(%)
                  52.50      3.00      157.50    6.30
Hours Used       2122

```

### show chassis environment psm (MX2010 Router)

```
user@host> show chassis environment psm
```

```

PSM 0 status:
State            Online
Temperature      OK
DC Input         Feed      Voltage(V) Current(A) Power(W)
                  INP0      51.20      14.70      752.64
                  INP1      0.00        0.00      0.00
DC Output         Voltage(V) Current(A) Power(W) Load(%)
                  51.25      13.00      666.25    26.65
Hours Used       2056
PSM 1 status:
State            Online
Temperature      OK
DC Input         Feed      Voltage(V) Current(A) Power(W)
                  INP0      51.20      14.35      734.72
                  INP1      0.00        0.00      0.00
DC Output         Voltage(V) Current(A) Power(W) Load(%)
                  51.25      12.75      653.44    26.14
Hours Used       2008
PSM 2 status:
State            Online
Temperature      OK
DC Input         Feed      Voltage(V) Current(A) Power(W)
                  INP0      51.20      14.35      734.72
                  INP1      0.00        0.00      0.00
DC Output         Voltage(V) Current(A) Power(W) Load(%)
                  51.50      13.00      669.50    26.78
Hours Used       2032
PSM 3 status:
State            Online

```

Temperature	OK				
DC Input	Feed	Voltage(V)	Current(A)	Power(W)	
	INP0	50.40	14.35	723.24	
	INP1	0.00	0.00	0.00	
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)	
	51.00	12.75	650.25	26.01	
Hours Used	2008				
PSM 4 status:					
State	Online				
Temperature	OK				
DC Input	Feed	Voltage(V)	Current(A)	Power(W)	
	INP0	51.20	14.00	716.80	
	INP1	0.00	0.00	0.00	
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)	
	51.25	13.00	666.25	26.65	
Hours Used	2055				
PSM 5 status:					
State	Online				
Temperature	OK				
DC Input	Feed	Voltage(V)	Current(A)	Power(W)	
	INP0	51.20	14.70	752.64	
	INP1	0.00	0.00	0.00	
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)	
	51.25	13.00	666.25	26.65	
Hours Used	2056				
PSM 6 status:					
State	Online				
Temperature	OK				
DC Input	Feed	Voltage(V)	Current(A)	Power(W)	
	INP0	50.80	14.70	746.76	
	INP1	0.00	0.00	0.00	
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)	
	51.25	13.00	666.25	26.65	
Hours Used	2056				
PSM 7 status:					
State	Online				
Temperature	OK				
DC Input	Feed	Voltage(V)	Current(A)	Power(W)	
	INP0	50.40	14.70	740.88	
	INP1	0.00	0.00	0.00	
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)	
	51.25	13.00	666.25	26.65	
Hours Used	2056				
PSM 8 status:					
State	Online				
Temperature	OK				
DC Input	Feed	Voltage(V)	Current(A)	Power(W)	
	INP0	50.40	14.70	740.88	
	INP1	0.00	0.00	0.00	
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)	
	51.25	13.00	666.25	26.65	
Hours Used	2056				

### show chassis environment psm (MX2008 Router)

```
user@host> show chassis environment psm
```

PSM 1 status:	
State	Online
Temperature	OK

DC Input	Feed	Voltage(V)	Current(A)	Power(W)
	INP0	53.20	4.55	242.06
	INP1	53.20	3.85	204.82
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)
	51.50	7.75	399.12	15.96
Hours Used	2811			
PSM 2 status:				
State	Online			
Temperature	OK			
DC Input	Feed	Voltage(V)	Current(A)	Power(W)
	INP0	53.20	4.55	242.06
	INP1	53.20	3.85	204.82
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)
	51.25	8.00	410.00	16.40
Hours Used	2882			
PSM 3 status:				
State	Online			
Temperature	OK			
DC Input	Feed	Voltage(V)	Current(A)	Power(W)
	INP0	52.40	1.75	91.70
	INP1	52.80	8.40	443.52
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)
	51.50	7.75	399.12	15.96
Hours Used	2668			
PSM 4 status:				
State	Online			
Temperature	OK			
DC Input	Feed	Voltage(V)	Current(A)	Power(W)
	INP0	52.80	0.35	18.48
	INP1	53.20	8.40	446.88
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)
	51.50	7.75	399.12	15.96
Hours Used	2740			
PSM 5 status:				
State	Online			
Temperature	OK			
DC Input	Feed	Voltage(V)	Current(A)	Power(W)
	INP0	52.40	0.00	0.00
	INP1	53.20	8.40	446.88
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)
	51.50	7.75	399.12	15.96
Hours Used	2932			
PSM 6 status:				
State	Online			
Temperature	OK			
DC Input	Feed	Voltage(V)	Current(A)	Power(W)
	INP0	54.00	8.40	453.60
	INP1	53.20	0.00	0.00
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)
	51.50	7.75	399.12	15.96
Hours Used	2932			
PSM 7 status:				
State	Online			
Temperature	OK			
DC Input	Feed	Voltage(V)	Current(A)	Power(W)
	INP0	54.00	8.40	453.60
	INP1	53.20	0.00	0.00
DC Output	Voltage(V)	Current(A)	Power(W)	Load(%)
	51.25	7.75	397.19	15.89
Hours Used	2931			





## show chassis environment routing-engine

**List of Syntax**

- Syntax on page 1239
- Syntax (TX Matrix Routers) on page 1239
- Syntax (TX Matrix Plus Routers) on page 1239
- Syntax (MX104, MX2010, MX2020, MX10003, MX204, and MX2008 Universal Routing Platforms) on page 1239
- Syntax (MX Series Routers) on page 1239
- Syntax (PTX Series Routers) on page 1239
- Syntax (QFX Series) on page 1240
- Syntax (OCX Series) on page 1240
- Syntax (ACX5048 and ACX5096 Routers) on page 1240
- Syntax (ACX500 Routers) on page 1240
- Syntax (EX9251, EX9253 Switches) on page 1240

**Syntax** show chassis environment routing-engine  
<slot>

**Syntax (TX Matrix Routers)** show chassis environment routing-engine  
<lcc number | scc>  
<slot>

**Syntax (TX Matrix Plus Routers)** show chassis environment routing-engine  
<lcc number | sfc number>  
<slot>

**Syntax (MX104, MX2010, MX2020, MX10003, MX204, and MX2008 Universal Routing Platforms)** show chassis environment routing-engine  
<slot>  
<satellite [fpc-slot slot-id | device-alias alias-name]

**Syntax (MX Series Routers)** show chassis environment routing-engine  
<slot>  
<all-members>  
<local>  
<member member-id>

**Syntax (PTX Series Routers)** show chassis environment routing-engine  
<slot>  
<all-members>  
<local>  
<member member-id>

<b>Syntax (QFX Series)</b>	show chassis environment routing-engine interconnect-device <i>name</i>
<b>Syntax (OCX Series)</b>	show chassis environment routing-engine interconnect-device <i>name</i>
<b>Syntax (ACX5048 and ACX5096 Routers)</b>	show chassis environment routing-engine
<b>Syntax (ACX500 Routers)</b>	show chassis environment routing-engine
<b>Syntax (EX9251, EX9253 Switches)</b>	show chassis environment routing-engine
<b>Release Information</b>	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>sfc option introduced in Junos OS Release 9.6 for the TX Matrix Plus router.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 12.1 for the PTX Series Packet Transport Routers and T4000 Core Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 and MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 13.2 for MX104 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 15.1X54-D20 for ACX5048 and ACX5096 Routers.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.2 for PTX10008 Routers.</p> <p>Command introduced in Junos OS Release 17.3 for MX150 Router Appliance.</p> <p>Command introduced in Junos OS Release 17.4 for MX204 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 18.1R1 for EX9251 Switches.</p> <p>Command introduced in Junos OS Release 18.2 for EX9253 Switches.</p> <p>Command introduced in Junos OS Release 18.2R1 for MX10008 Routers.</p>
<b>Description</b>	Display Routing Engine environmental status information.
<b>Options</b>	<p><b>none</b>—Display environmental information about all Routing Engines. For a TX Matrix router, display environmental information about all Routing Engines on the TX Matrix router and its attached T640 routers. For a TX Matrix Plus router, display environmental information about all Routing Engines on the TX Matrix Plus router and its attached routers.</p> <p><b>all-members</b>—(MX Series routers only) (Optional) Display environmental information about the Routing Engines in all member routers in the Virtual Chassis configuration.</p>

**interconnect-device *name***—(QFabric systems only) (Optional) Display environmental information about the Routing Engines for the Interconnect device.

**lcc *number***—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers only) (Optional) Display environmental information about the Routing Engines in the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Display environmental information about the Routing Engines in the specified member in the Virtual Chassis configuration. Replace *member-id* with the value of 0 or 1.

**satellite [*fpc-slot slot-id* | *device-alias alias-name*]**—(Junos Fusion only)(Optional) Display environmental information for the specified satellite device in a Junos Fusion, or for all satellite devices in the Junos Fusion if no satellite devices are specified.

**scc**—(TX Matrix router only) (Optional) Display environmental information about the Routing Engine in the TX Matrix router (switch-card chassis).

**sfc**—(TX Matrix Plus router only) (Optional) Display environmental information about the Routing Engine in the TX Matrix Plus router (or switch-fabric chassis).

**slot**—(Optional) Display environmental information about an individual Routing Engine. On M10i, M20, M40e, M120, M160, M320, MX Series, MX104 routers, MX2010 routers, MX2020 routers, MX2008 routers, and T Series routers, replace *slot* with 0 or 1. On M5, M7i, M10, and M40 routers, replace *slot* with 0. On EX3200 and EX4200 standalone switches, replace *slot* with 0. On EX4200 switches in a Virtual Chassis configuration and on EX8208 and EX8216 switches, replace *slot* with 0 or 1. On the QFX3500 switch, there is only one Routing Engine, so you do not need to specify the slot number. On PTX Series Packet Transport Routers, replace *slot* with 0 or 1.

**Required Privilege Level** view

**Related Documentation**

- [request chassis routing-engine master on page 886](#)
- [show chassis routing-engine on page 2083](#)

- List of Sample Output**
- [show chassis environment routing-engine \(Nonredundant\) on page 1243](#)
  - [show chassis environment routing-engine \(Redundant\) on page 1243](#)
  - [show chassis environment routing-engine \(MX150\) on page 1243](#)
  - [show chassis environment routing-engine \(MX104 Router\) on page 1243](#)
  - [show chassis environment routing-engine \(MX2010 Router\) on page 1243](#)
  - [show chassis environment routing-engine \(MX2020 Router\) on page 1243](#)
  - [show chassis environment routing-engine \(MX2008 Router\) on page 1244](#)
  - [show chassis environment routing-engine \(TX Matrix Plus Router\) on page 1244](#)
  - [show chassis environment routing-engine \(T4000 Core Router\) on page 1244](#)
  - [show chassis environment routing-engine \(QFX Series and OCX Series\) on page 1244](#)
  - [show chassis environment routing-engine interconnect-device \(QFabric System\) on page 1245](#)
  - [show chassis environment routing-engine \(PTX5000 Packet Transport Router\) on page 1245](#)
  - [show chassis environment routing-engine \(PTX10008 Router\) on page 1245](#)
  - [show chassis environment routing-engine \(PTX10016 Router\) on page 1245](#)
  - [show chassis environment routing-engine \(ACX5048 and ACX5096 Routers\) on page 1245](#)
  - [show chassis environment routing-engine \(ACX500 Routers\) on page 1246](#)
  - [show chassis environment routing-engine \(PTX5000 \(RE-PTX-X8-64G\), MX240 \(RE-S-X6-64G\), MX480 \(RE-S-X6-64G\), MX960 \(RE-S-X6-64G\), MX2010 \(RE-MX2K-X8-64G\), MX2020 \(RE-MX2K-X8-64G\) on page 1246](#)
  - [show chassis environment routing-engine \(MX204 Routers\) on page 1246](#)
  - [show chassis environment routing-engine \(MX10008 Routers\) on page 1246](#)
  - [show chassis environment routing-engine \(EX9251 Switches\) on page 1246](#)
  - [show chassis environment routing-engine \(EX9253 Switches\) on page 1246](#)

**Output Fields** [Table 112 on page 1242](#) lists the output fields for the **show chassis environment routing-engine** command. Output fields are listed in the approximate order in which they appear.

*Table 112: show chassis environment routing-engine Output Fields*

Field Name	Field Description
Routing engine <i>slot</i> status	Number of the Routing Engine slot: 0 or 1.
State	Status of the Routing Engine: <ul style="list-style-type: none"> <li>• Online Master—Routing Engine is online, operating as Master.</li> <li>• Online Standby—Routing Engine is online, operating as Standby.</li> <li>• Offline—Routing Engine is offline.</li> </ul>
Temperature	Temperature of the air flowing past the Routing Engine.
CPU Temperature	(PTX Series and T4000 Core Routers only) Temperature of the air flowing past the Routing Engine CPU.

## Sample Output

### show chassis environment routing-engine (Nonredundant)

```
user@host> show chassis environment routing-engine

Routing Engine 0 status:
  State                Online Master
  Temperature          27 degrees C / 80 degrees
```

### show chassis environment routing-engine (Redundant)

```
user@host> show chassis environment routing-engine

Route Engine 0 status:
  State                Online Master
  Temperature          26 degrees C / 78 degrees F
Route Engine 1 status:
  State                Online Standby
  Temperature          26 degrees C / 78 degrees F
```

### show chassis environment routing-engine (MX150)

```
user@ host >show chassis environment routing-engine

Routing Engine 0 status:
  State                Online Master
  CPU Temperature      42 degrees C / 107 degrees F
```

### show chassis environment routing-engine (MX104 Router)

```
user@ host >show chassis environment routing-engine

Routing Engine 0 status:
  State                Online Master
  Temperature          34 degrees C / 93 degrees F
  CPU Temperature      43 degrees C / 109 degrees F
Routing Engine 1 status:
  State                Online Standby
  Temperature          33 degrees C / 91 degrees F
  CPU Temperature      39 degrees C / 102 degrees F
```

### show chassis environment routing-engine (MX2010 Router)

```
user@host> show chassis environment routing-engine

Routing Engine 0 status:
  State                Online Master
  Temperature          37 degrees C / 98 degrees F
  CPU Temperature      37 degrees C / 98 degrees F
Routing Engine 1 status:
  State                Online Standby
  Temperature          35 degrees C / 95 degrees F
  CPU Temperature      34 degrees C / 93 degrees F
```

### show chassis environment routing-engine (MX2020 Router)

```
user@host> show chassis environment routing-engine
```

```
Routing Engine 0 status:
  State           Online Master
  Temperature      35 degrees C / 95 degrees F
  CPU Temperature  34 degrees C / 93 degrees F
Routing Engine 1 status:
  State           Online Standby
  Temperature      44 degrees C / 111 degrees F
  CPU Temperature  43 degrees C / 109 degrees F
```

#### show chassis environment routing-engine (MX2008 Router)

```
user@host> show chassis environment routing-engine

Routing Engine 0 status:
  State           Online Master
  CPU Temperature  75 degrees C / 167 degrees F
Routing Engine 1 status:
  State           Online Standby
  CPU Temperature  47 degrees C / 116 degrees F
```

#### show chassis environment routing-engine (TX Matrix Plus Router)

```
user@host> show chassis environment routing-engine

sfc0-re0:
-----
Routing Engine 0 status:
  State           Online Master
  Temperature      26 degrees C / 78 degrees F
Routing Engine 1 status:
  State           Online Standby
  Temperature      28 degrees C / 82 degrees F

lcc0-re0:
-----
Routing Engine 0 status:
  State           Online Master
  Temperature      30 degrees C / 86 degrees F
Routing Engine 1 status:
  State           Online Standby
  Temperature      29 degrees C / 84 degrees F
```

#### show chassis environment routing-engine (T4000 Core Router)

```
user@host> show chassis environment routing-engine

Routing Engine 0 status:
  State           Online Master
  Temperature      33 degrees C / 91 degrees F
  CPU Temperature  50 degrees C / 122 degrees F
Routing Engine 1 status:
  State           Online Standby
  Temperature      33 degrees C / 91 degrees F
  CPU Temperature  46 degrees C / 114 degrees F
```

#### show chassis environment routing-engine (QFX Series and OCX Series)

```
user@switch> show chassis environment routing-engine
```

```
Routing Engine 0 status:
  State           Online Master
  Temperature      42 degrees C / 107 degrees F
```

### show chassis environment routing-engine interconnect-device (QFabric System)

```
user@switch> show chassis environment routing-engine interconnect-device interconnect1
routing-engine interconnect-device interconnect1
Routing Engine 0 status:
  State           Online Standby
  Temperature      52 degrees C / 125 degrees F
Routing Engine 1 status:
  State           Online Master
  Temperature      57 degrees C / 134 degrees F
```

### show chassis environment routing-engine (PTX5000 Packet Transport Router)

```
user@switch> show chassis environment routing-engine
Routing Engine 0 status:
  State           Online Master
  Temperature      55 degrees C / 131 degrees F
  CPU Temperature  66 degrees C / 150 degrees F
Routing Engine 1 status:
  State           Online Standby
  Temperature      52 degrees C / 125 degrees F
  CPU Temperature  64 degrees C / 147 degrees F
```

### show chassis environment routing-engine (PTX10008 Router)

```
user@switch> show chassis environment routing-engine
Routing Engine 0 status:
  State           Online Master
  CPU Temperature  40 degrees C / 104 degrees F
Routing Engine 1 status:
  State           Online Standby
  CPU Temperature  40 degrees C / 104 degrees F
```

### show chassis environment routing-engine (PTX10016 Router)

```
user@switch> show chassis environment routing-engine
Routing Engine 0 status:
  State           Online Master
  CPU Temperature  33 degrees C / 91 degrees F
Routing Engine 1 status:
  State           Online Standby
  CPU Temperature  38 degrees C / 100 degrees F
```

### show chassis environment routing-engine (ACX5048 and ACX5096 Routers)

```
user@host> show chassis environment routing-engine
Routing Engine 0 status:
  State           Online Master
  Temperature      33 degrees C / 91 degrees F
```

### show chassis environment routing-engine (ACX500 Routers)

```
user@host> show chassis environment routing-engine

Routing Engine 0 status:
  State                Online Master
  Temperature           54 degrees C / 129 degrees F
```

### Sample Output

show chassis environment routing-engine (PTX5000 (RE-PTX-X8-64G), MX240 (RE-S-X6-64G), MX480 (RE-S-X6-64G), MX960 (RE-S-X6-64G), MX2010 (RE-MX2K-X8-64G), MX2020 (RE-MX2K-X8-64G))

```
user@switch> show chassis environment routing-engine

Routing Engine 0 status:
  State                Online Master
  Temperature           37 degrees C / 98 degrees F
  CPU Temperature       52 degrees C / 125 degrees F
Routing Engine 1 status:
  State                Online Standby
  Temperature           37 degrees C / 98 degrees F
  CPU Temperature       51 degrees C / 123 degrees F
```

### show chassis environment routing-engine (MX204 Routers)

```
user@host> show chassis environment routing-engine

Routing Engine 0 status:
  State                Online Master
```

### show chassis environment routing-engine (MX10008 Routers)

```
Routing Engine 0 status:
  State                Online Master
  CPU Temperature           41 degrees C / 105 degrees F
Routing Engine 1 status:
  State                Online Standby
  CPU Temperature         40 degrees C / 104 degrees F
```

### show chassis environment routing-engine (EX9251 Switches)

```
user@switch> show chassis environment routing-engine

Routing Engine 0 status:
  State                Online Master
```

### show chassis environment routing-engine (EX9253 Switches)

```
user@switch> show chassis environment routing-engine

Routing Engine 0 status:
  State                Online Master
Routing Engine 1 status:
  State                Present
```





## show chassis environment scg

**List of Syntax**    [Syntax on page 1248](#)  
[Syntax \(TX Matrix and TX Matrix Plus Router\) on page 1248](#)

**Syntax**    `show chassis environment scg  
<slot>`

**Syntax (TX Matrix and TX Matrix Plus Router)**    `show chassis environment scg  
<lcc number>  
<slot>`

**Release Information**    Command introduced before Junos OS Release 7.4.  
 Command introduced in Junos OS Release 12.1 for the T4000 Core Routers.

**Description**    Display SONET Clock Generator (SCG) environmental information.

**Options**    **none**—(TX Matrix and TX Matrix Plus routers only) Display environmental information about all SCGs. On a TX Matrix router, display environmental information about all SCGs on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display environmental information about all SCGs on the TX Matrix Plus router and its attached routers.

**lcc number**—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**slot**—(Optional) Display environmental information about the SCG. Replace **slot** with 0 or 1.

**Required Privilege Level**    view

- Related Documentation**
- [request chassis scg on page 891](#)
  - [Configuring the Clock Source](#)
  - [T320 SONET Clock Generator \(SCG\) Description](#)

**List of Sample Output**

[show chassis environment scg \(T Series Routers\) on page 1249](#)  
[show chassis environment scg \(T4000 Core Routers\) on page 1250](#)  
[show chassis environment scg lcc \(TX Matrix Router\) on page 1250](#)  
[show chassis environment scg lcc \(TX Matrix Plus Router\) on page 1251](#)  
[show chassis environment scg \(TX Matrix Plus Router\) on page 1251](#)

**Output Fields** Table 113 on page 1249 lists the output fields for the **show chassis environment scg** command. Output fields are listed in the approximate order in which they appear.

*Table 113: show chassis environment scg Output Fields*

Field Name	Field Description
SCG slot status	Number of the SCG slot: 0 or 1.
State	Status of the SCG: <ul style="list-style-type: none"> <li>• <b>Online</b>—SCG is online and running.</li> <li>• <b>Offline</b>—SCG is powered down.</li> </ul> If two SCGs are installed and online, one is functioning as the master, and the other is the standby.
Temperature	Temperature of the air flowing past the SCG.
Power	Power on the SCG. The left column displays required power, in volts. The right column displays measured power, in millivolts.
BUS Revision	Revision level of the generic bus device.

## Sample Output

### show chassis environment scg (T Series Routers)

```

user@host> show chassis environment scg

SCG 0 status:
  State                Online - Master clock
  Temperature          29 degrees C / 84 degrees F
  Power:
    GROUND              0 mV
    3.3 V               3297 mV
    5.0 V               5050 mV
    5.6 V               5682 mV
    1.8 V bias          1787 mV
    3.3 V bias          3277 mV
    5.0 V bias          4984 mV
    8.0 V bias          8400 mV
  
```

```

BUS Revision                40
SCG 1 status:
  State                     Online - Standby
  Temperature               28 degrees C / 82 degrees F
  Power:
    GROUND                  0 mV
    3.3 V                   3317 mV
    5.0 V                   5057 mV
    5.6 V                   5689 mV
    1.8 V bias              1794 mV
    3.3 V bias              3296 mV
    5.0 V bias              4991 mV
    8.0 V bias              8410 mV
  BUS Revision              40

```

### show chassis environment scg (T4000 Core Routers)

```
user@host> show chassis environment scg
```

```

SCG 0 status:
  State                     Online - Master clock
  Temperature               33 degrees C / 91 degrees F
  Power:
    GROUND                  0 mV
    1.8 V bias              1794 mV
    3.3 V                   3310 mV
    3.3 V bias              3299 mV
    5.0 V                   5040 mV
    5.0 V bias              5003 mV
    5.6 V                   5780 mV
    8.0 V bias              7416 mV
  Bus Revision              40
SCG 1 status:
  State                     Online - Standby
  Temperature               33 degrees C / 91 degrees F
  Power:
    GROUND                  0 mV
    1.8 V bias              1794 mV
    3.3 V                   3319 mV
    3.3 V bias              3286 mV
    5.0 V                   5047 mV
    5.0 V bias              5013 mV
    5.6 V                   5758 mV
    8.0 V bias              7347 mV
  Bus Revision              40

```

### show chassis environment scg lcc (TX Matrix Router)

```
user@host> show chassis environment scg lcc 0 0
```

```
lcc0-re0:
```

```

-----
SCG 0 status:
  State                     Online - Master clock
  Temperature               30 degrees C / 86 degrees F
  Power:
    GROUND                  0 mV
    3.3 V                   3321 mV
    5.0 V                   5062 mV

```

5.6 V	5682 mV
1.8 V bias	1789 mV
3.3 V bias	3289 mV
5.0 V bias	4993 mV
8.0 V bias	7807 mV
BUS Revision	40

### show chassis environment scg lcc (TX Matrix Plus Router)

```
user@host> show chassis environment scg lcc 0
```

```
lcc0-re0:
```

```
-----
```

```
SCG 0 status:
```

State	Online - Master clock
Temperature	42 degrees C / 107 degrees F
Power	
GROUND	0 mV
1.8 V bias	1800 mV
3.3 V	3290 mV
3.3 V bias	3304 mV
5.0 V	5042 mV
5.0 V bias	4979 mV
5.6 V	5765 mV
8.0 V bias	7682 mV
Bus Revision	40

### show chassis environment scg (TX Matrix Plus Router)

```
user@host> show chassis environment scg
```

```
lcc0-re0:
```

```
-----
```

```
SCG 0 status:
```

State	Online - Master clock
Temperature	40 degrees C / 104 degrees F
Power	
GROUND	0 mV
1.8 V bias	1800 mV
3.3 V	3291 mV
3.3 V bias	3304 mV
5.0 V	5042 mV
5.0 V bias	4979 mV
5.6 V	5765 mV
8.0 V bias	7643 mV
Bus Revision	40

```
lcc1-re0:
```

```
-----
```

```
SCG 0 status:
```

State	Online - Master clock
Temperature	37 degrees C / 98 degrees F
Power	
GROUND	0 mV
1.8 V bias	1788 mV
3.3 V	3305 mV
3.3 V bias	3284 mV
5.0 V	5042 mV
5.0 V bias	5010 mV

5.6 V	5748 mV
8.0 V bias	7692 mV
Bus Revision	40

lcc2-re0:

-----  
SCG 0 status:

State	Online - Master clock
Temperature	39 degrees C / 102 degrees F
Power	
GROUND	0 mV
1.8 V bias	1785 mV
3.3 V	3306 mV
3.3 V bias	3301 mV
5.0 V	5045 mV
5.0 V bias	4993 mV
5.6 V	5765 mV
8.0 V bias	7838 mV
Bus Revision	40

lcc3-re0:

-----  
SCG 0 status:

State	Online - Master clock
Temperature	39 degrees C / 102 degrees F
Power	
GROUND	0 mV
1.8 V bias	1800 mV
3.3 V	3290 mV
3.3 V bias	3294 mV
5.0 V	5050 mV
5.0 V bias	4984 mV
5.6 V	5780 mV
8.0 V bias	7716 mV
Bus Revision	40

## show chassis environment sfb

<b>Syntax</b>	<pre>show chassis environment sfb &lt;all-members&gt; &lt;local&gt; &lt;member <i>member-id</i>&gt; &lt;<i>sfb-slot-number</i>&gt;</pre>
<b>Release Information</b>	<p>Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms. Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms. <b>all-members</b>, <b>local</b>, and <b>member <i>member-id</i></b> options introduced in Junos OS Release 15.1 for MX2020 and MX2010 routers.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms. Command introduced in Junos OS Release 18.2 for MX10008 Universal Routing Platforms.</p>
<b>Description</b>	Display chassis environmental information about the Switch Fabric Board (SFB).
<b>Options</b>	<p><b>none</b>—Display environmental information about all Switch Fabric Boards.</p> <p><b>all-members</b>—(Optional) Display chassis environmental information about the SFB in all members of the Virtual Chassis configuration.</p> <p><b>local</b>—(Optional) Display chassis environmental information about the SFB in the local member of the Virtual Chassis.</p> <p><b>member <i>member-id</i></b>—(Optional) Display chassis environmental information about the SFB in the specified member of the Virtual Chassis. Replace <b><i>member-id</i></b> with the value 0 or 1.</p> <p><b><i>sfb-slot-number</i></b>—(Optional) Display environmental information about the specified Switch Fabric Board. For MX2020, MX2010, and MX2008 routers, replace <b><i>sfb-slot-number</i></b> with a value from 0 through 7.</p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">request chassis sfb on page 893</a></li> <li>• <a href="#">show chassis sfb on page 2116</a></li> </ul>
<b>List of Sample Output</b>	<p><a href="#">show chassis environment sfb (MX2020 Router) on page 1254</a></p> <p><a href="#">show chassis environment sfb (MX2010 Router) on page 1258</a></p> <p><a href="#">show chassis environment sfb (MX2008 Router) on page 1262</a></p> <p><a href="#">show chassis environment sfb (MX10008 Router) on page 1263</a></p>
<b>Output Fields</b>	<p><a href="#">Table 114 on page 1254</a> lists the output fields for the <b>show chassis environment sfb</b> command. Output fields are listed in the approximate order in which they appear.</p>

Table 114: show chassis environment sfb Output Fields

Field Name	Field Description
<b>State</b>	Status of the SFB. <ul style="list-style-type: none"> <li>• <b>Online</b>—The SFB is online and running.</li> <li>• <b>Offline</b>— SFB is powered down.</li> </ul>
<b>Temperature</b>	Temperature in Celsius (C) and Fahrenheit (F) of the air flowing past the SFB. <ul style="list-style-type: none"> <li>• <b>Intake</b>—Measures the temperature of the air intake.</li> <li>• <b>Exhaust</b>—Measures the temperature of the hot air exhaust.</li> <li>• <b>SFB-XF2</b>—Measures the temperature of the hot air exhaust for the XF2 fabric plane.</li> <li>• <b>SFB-XF1</b>—Measures the temperature of the hot air exhaust for the XF1 fabric plane.</li> <li>• <b>SFB-XF0</b>—Measures the temperature of the hot air exhaust for the XF0 fabric plane.</li> </ul>
<b>Power</b>	Power required and measured on the SFB. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.

## Sample Output

### show chassis environment sfb (MX2020 Router)

```

user@host> show chassis environment sfb

SFB 0 status:
  State                Online
  Intake-Zone0 Temperature 51 degrees C / 123 degrees F
  Exhaust-Zone1 Temperature 44 degrees C / 111 degrees F
  IntakeA-Zone0 Temperature 46 degrees C / 114 degrees F
  IntakeB-Zone1 Temperature 37 degrees C / 98 degrees F
  Exhaust-Zone0 Temperature 48 degrees C / 118 degrees F
  SFB-XF2-Zone1 Temperature 58 degrees C / 136 degrees F
  SFB-XF1-Zone0 Temperature 65 degrees C / 149 degrees F
  SFB-XF0-Zone0 Temperature 64 degrees C / 147 degrees F
  Power
    LTC3880-XF2-1.5v-RAIL 1500 mV
    LTC3880-XF2-1.5v-CH0 1500 mV
    LTC3880-XF2-1.5v-CH1 1500 mV
    LTC3880-XF2-1.0v-RAIL 1029 mV
    LTC3880-XF2-1.0v-CH0 1029 mV
    LTC3880-XF2-1.0v-CH1 1032 mV
    LTC3880-XF1-1.5v-RAIL 1499 mV
    LTC3880-XF1-1.5v-CH0 1499 mV
    LTC3880-XF1-1.5v-CH1 1501 mV
    LTC3880-XF1-1.0v-RAIL 1029 mV
    LTC3880-XF1-1.0v-CH0 1029 mV
    LTC3880-XF1-1.0v-CH1 1033 mV
    LTC3880-XF0-1.5v-RAIL 1500 mV
    LTC3880-XF0-1.5v-CH0 1500 mV
    LTC3880-XF0-1.5v-CH1 1501 mV
    LTC3880-XF0-1.0v-RAIL 1029 mV
    LTC3880-XF0-1.0v-CH0 1029 mV
    LTC3880-XF0-1.0v-CH1 1033 mV
    LTC3880-3.3v-RAIL 3300 mV
    LTC3880-3.3v-CH0 3300 mV

```



```

LTC3880-3.3v-CH1          3299 mV
SFB 1 status:
State                      Online
Intake-Zone0 Temperature  52 degrees C / 125 degrees F
Exhaust-Zone1 Temperature 44 degrees C / 111 degrees F
IntakeA-Zone0 Temperature 47 degrees C / 116 degrees F
IntakeB-Zone1 Temperature 37 degrees C / 98 degrees F
Exhaust-Zone0 Temperature 47 degrees C / 116 degrees F
SFB-XF2-Zone1 Temperature 59 degrees C / 138 degrees F
SFB-XF1-Zone0 Temperature 63 degrees C / 145 degrees F
SFB-XF0-Zone0 Temperature 65 degrees C / 149 degrees F
Power
LTC3880-XF2-1.5v-RAIL     1500 mV
LTC3880-XF2-1.5v-CH0      1500 mV
LTC3880-XF2-1.5v-CH1      1501 mV
LTC3880-XF2-1.0v-RAIL     1030 mV
LTC3880-XF2-1.0v-CH0      1030 mV
LTC3880-XF2-1.0v-CH1      1033 mV
LTC3880-XF1-1.5v-RAIL     1499 mV
LTC3880-XF1-1.5v-CH0      1499 mV
LTC3880-XF1-1.5v-CH1      1500 mV
LTC3880-XF1-1.0v-RAIL     1029 mV
LTC3880-XF1-1.0v-CH0      1029 mV
LTC3880-XF1-1.0v-CH1      1033 mV
LTC3880-XF0-1.5v-RAIL     1500 mV
LTC3880-XF0-1.5v-CH0      1500 mV
LTC3880-XF0-1.5v-CH1      1501 mV
LTC3880-XF0-1.0v-RAIL     1030 mV
LTC3880-XF0-1.0v-CH0      1030 mV
LTC3880-XF0-1.0v-CH1      1033 mV
LTC3880-3.3v-RAIL         3300 mV
LTC3880-3.3v-CH0          3300 mV
LTC3880-3.3v-CH1          3299 mV
SFB 2 status:
State                      Online
Intake-Zone0 Temperature  52 degrees C / 125 degrees F
Exhaust-Zone1 Temperature 44 degrees C / 111 degrees F
IntakeA-Zone0 Temperature 47 degrees C / 116 degrees F
IntakeB-Zone1 Temperature 37 degrees C / 98 degrees F
Exhaust-Zone0 Temperature 49 degrees C / 120 degrees F
SFB-XF2-Zone1 Temperature 62 degrees C / 143 degrees F
SFB-XF1-Zone0 Temperature 66 degrees C / 150 degrees F
SFB-XF0-Zone0 Temperature 66 degrees C / 150 degrees F
Power
LTC3880-XF2-1.5v-RAIL     1499 mV
LTC3880-XF2-1.5v-CH0      1499 mV
LTC3880-XF2-1.5v-CH1      1500 mV
LTC3880-XF2-1.0v-RAIL     1030 mV
LTC3880-XF2-1.0v-CH0      1030 mV
LTC3880-XF2-1.0v-CH1      1033 mV
LTC3880-XF1-1.5v-RAIL     1500 mV
LTC3880-XF1-1.5v-CH0      1500 mV
LTC3880-XF1-1.5v-CH1      1501 mV
LTC3880-XF1-1.0v-RAIL     1030 mV
LTC3880-XF1-1.0v-CH0      1030 mV
LTC3880-XF1-1.0v-CH1      1033 mV
LTC3880-XF0-1.5v-RAIL     1499 mV
LTC3880-XF0-1.5v-CH0      1499 mV
LTC3880-XF0-1.5v-CH1      1501 mV
LTC3880-XF0-1.0v-RAIL     1030 mV

```

LTC3880-XF0-1.0v-CH0	1030 mV
LTC3880-XF0-1.0v-CH1	1033 mV
LTC3880-3.3v-RAIL	3300 mV
LTC3880-3.3v-CH0	3300 mV
LTC3880-3.3v-CH1	3299 mV
SFB 3 status:	
State	Online
Intake-Zone0 Temperature	53 degrees C / 127 degrees F
Exhaust-Zone1 Temperature	44 degrees C / 111 degrees F
IntakeA-Zone0 Temperature	48 degrees C / 118 degrees F
IntakeB-Zone1 Temperature	38 degrees C / 100 degrees F
Exhaust-Zone0 Temperature	49 degrees C / 120 degrees F
SFB-XF2-Zone1 Temperature	62 degrees C / 143 degrees F
SFB-XF1-Zone0 Temperature	65 degrees C / 149 degrees F
SFB-XF0-Zone0 Temperature	68 degrees C / 154 degrees F
Power	
LTC3880-XF2-1.5v-RAIL	1500 mV
LTC3880-XF2-1.5v-CH0	1500 mV
LTC3880-XF2-1.5v-CH1	1500 mV
LTC3880-XF2-1.0v-RAIL	1029 mV
LTC3880-XF2-1.0v-CH0	1029 mV
LTC3880-XF2-1.0v-CH1	1033 mV
LTC3880-XF1-1.5v-RAIL	1500 mV
LTC3880-XF1-1.5v-CH0	1500 mV
LTC3880-XF1-1.5v-CH1	1501 mV
LTC3880-XF1-1.0v-RAIL	1030 mV
LTC3880-XF1-1.0v-CH0	1030 mV
LTC3880-XF1-1.0v-CH1	1033 mV
LTC3880-XF0-1.5v-RAIL	1499 mV
LTC3880-XF0-1.5v-CH0	1499 mV
LTC3880-XF0-1.5v-CH1	1501 mV
LTC3880-XF0-1.0v-RAIL	1030 mV
LTC3880-XF0-1.0v-CH0	1030 mV
LTC3880-XF0-1.0v-CH1	1034 mV
LTC3880-3.3v-RAIL	3300 mV
LTC3880-3.3v-CH0	3300 mV
LTC3880-3.3v-CH1	3300 mV
SFB 4 status:	
State	Online
Intake-Zone0 Temperature	54 degrees C / 129 degrees F
Exhaust-Zone1 Temperature	46 degrees C / 114 degrees F
IntakeA-Zone0 Temperature	49 degrees C / 120 degrees F
IntakeB-Zone1 Temperature	39 degrees C / 102 degrees F
Exhaust-Zone0 Temperature	50 degrees C / 122 degrees F
SFB-XF2-Zone1 Temperature	61 degrees C / 141 degrees F
SFB-XF1-Zone0 Temperature	64 degrees C / 147 degrees F
SFB-XF0-Zone0 Temperature	67 degrees C / 152 degrees F
Power	
LTC3880-XF2-1.5v-RAIL	1500 mV
LTC3880-XF2-1.5v-CH0	1500 mV
LTC3880-XF2-1.5v-CH1	1500 mV
LTC3880-XF2-1.0v-RAIL	1030 mV
LTC3880-XF2-1.0v-CH0	1030 mV
LTC3880-XF2-1.0v-CH1	1033 mV
LTC3880-XF1-1.5v-RAIL	1499 mV
LTC3880-XF1-1.5v-CH0	1499 mV
LTC3880-XF1-1.5v-CH1	1501 mV
LTC3880-XF1-1.0v-RAIL	1030 mV
LTC3880-XF1-1.0v-CH0	1030 mV
LTC3880-XF1-1.0v-CH1	1033 mV

```

LTC3880-XF0-1.5v-RAIL      1500 mV
LTC3880-XF0-1.5v-CH0       1500 mV
LTC3880-XF0-1.5v-CH1       1501 mV
LTC3880-XF0-1.0v-RAIL      1030 mV
LTC3880-XF0-1.0v-CH0       1030 mV
LTC3880-XF0-1.0v-CH1       1033 mV
LTC3880-3.3v-RAIL          3299 mV
LTC3880-3.3v-CH0           3299 mV
LTC3880-3.3v-CH1           3299 mV
SFB 5 status:
State                       Online
Intake-Zone0 Temperature    54 degrees C / 129 degrees F
Exhaust-Zone1 Temperature   46 degrees C / 114 degrees F
IntakeA-Zone0 Temperature   49 degrees C / 120 degrees F
IntakeB-Zone1 Temperature   40 degrees C / 104 degrees F
Exhaust-Zone0 Temperature   50 degrees C / 122 degrees F
SFB-XF2-Zone1 Temperature   63 degrees C / 145 degrees F
SFB-XF1-Zone0 Temperature   65 degrees C / 149 degrees F
SFB-XF0-Zone0 Temperature   70 degrees C / 158 degrees F
Power
LTC3880-XF2-1.5v-RAIL      1500 mV
LTC3880-XF2-1.5v-CH0       1500 mV
LTC3880-XF2-1.5v-CH1       1500 mV
LTC3880-XF2-1.0v-RAIL      1029 mV
LTC3880-XF2-1.0v-CH0       1029 mV
LTC3880-XF2-1.0v-CH1       1033 mV
LTC3880-XF1-1.5v-RAIL      1499 mV
LTC3880-XF1-1.5v-CH0       1499 mV
LTC3880-XF1-1.5v-CH1       1500 mV
LTC3880-XF1-1.0v-RAIL      1030 mV
LTC3880-XF1-1.0v-CH0       1030 mV
LTC3880-XF1-1.0v-CH1       1033 mV
LTC3880-XF0-1.5v-RAIL      1499 mV
LTC3880-XF0-1.5v-CH0       1499 mV
LTC3880-XF0-1.5v-CH1       1501 mV
LTC3880-XF0-1.0v-RAIL      1029 mV
LTC3880-XF0-1.0v-CH0       1029 mV
LTC3880-XF0-1.0v-CH1       1033 mV
LTC3880-3.3v-RAIL          3299 mV
LTC3880-3.3v-CH0           3299 mV
LTC3880-3.3v-CH1           3300 mV
SFB 6 status:
State                       Online
Intake-Zone0 Temperature    54 degrees C / 129 degrees F
Exhaust-Zone1 Temperature   46 degrees C / 114 degrees F
IntakeA-Zone0 Temperature   48 degrees C / 118 degrees F
IntakeB-Zone1 Temperature   40 degrees C / 104 degrees F
Exhaust-Zone0 Temperature   49 degrees C / 120 degrees F
SFB-XF2-Zone1 Temperature   62 degrees C / 143 degrees F
SFB-XF1-Zone0 Temperature   64 degrees C / 147 degrees F
SFB-XF0-Zone0 Temperature   68 degrees C / 154 degrees F
Power
LTC3880-XF2-1.5v-RAIL      1499 mV
LTC3880-XF2-1.5v-CH0       1499 mV
LTC3880-XF2-1.5v-CH1       1501 mV
LTC3880-XF2-1.0v-RAIL      1030 mV
LTC3880-XF2-1.0v-CH0       1030 mV
LTC3880-XF2-1.0v-CH1       1033 mV
LTC3880-XF1-1.5v-RAIL      1499 mV
LTC3880-XF1-1.5v-CH0       1499 mV

```

```

LTC3880-XF1-1.5v-CH1      1500 mV
LTC3880-XF1-1.0v-RAIL     1029 mV
LTC3880-XF1-1.0v-CH0      1029 mV
LTC3880-XF1-1.0v-CH1      1033 mV
LTC3880-XF0-1.5v-RAIL     1499 mV
LTC3880-XF0-1.5v-CH0      1499 mV
LTC3880-XF0-1.5v-CH1      1501 mV
LTC3880-XF0-1.0v-RAIL     1029 mV
LTC3880-XF0-1.0v-CH0      1029 mV
LTC3880-XF0-1.0v-CH1      1033 mV
LTC3880-3.3v-RAIL         3300 mV
LTC3880-3.3v-CH0          3300 mV
LTC3880-3.3v-CH1          3300 mV
SFB 7 status:
State                      Online
Intake-Zone0 Temperature   53 degrees C / 127 degrees F
Exhaust-Zone1 Temperature  46 degrees C / 114 degrees F
IntakeA-Zone0 Temperature  49 degrees C / 120 degrees F
IntakeB-Zone1 Temperature  40 degrees C / 104 degrees F
Exhaust-Zone0 Temperature  50 degrees C / 122 degrees F
SFB-XF2-Zone1 Temperature  64 degrees C / 147 degrees F
SFB-XF1-Zone0 Temperature  66 degrees C / 150 degrees F
SFB-XF0-Zone0 Temperature  69 degrees C / 156 degrees F
Power
LTC3880-XF2-1.5v-RAIL     1500 mV
LTC3880-XF2-1.5v-CH0      1500 mV
LTC3880-XF2-1.5v-CH1      1501 mV
LTC3880-XF2-1.0v-RAIL     1029 mV
LTC3880-XF2-1.0v-CH0      1029 mV
LTC3880-XF2-1.0v-CH1      1033 mV
LTC3880-XF1-1.5v-RAIL     1499 mV
LTC3880-XF1-1.5v-CH0      1499 mV
LTC3880-XF1-1.5v-CH1      1501 mV
LTC3880-XF1-1.0v-RAIL     1030 mV
LTC3880-XF1-1.0v-CH0      1030 mV
LTC3880-XF1-1.0v-CH1      1033 mV
LTC3880-XF0-1.5v-RAIL     1499 mV
LTC3880-XF0-1.5v-CH0      1499 mV
LTC3880-XF0-1.5v-CH1      1501 mV
LTC3880-XF0-1.0v-RAIL     1030 mV
LTC3880-XF0-1.0v-CH0      1030 mV
LTC3880-XF0-1.0v-CH1      1033 mV
LTC3880-3.3v-RAIL         3300 mV
LTC3880-3.3v-CH0          3300 mV
LTC3880-3.3v-CH1          3300 mV

```

### show chassis environment sfb (MX2010 Router)

```
user@host> show chassis environment sfb
```

```

SFB 0 status:
State                      Online
Intake-Zone0 Temperature   31 degrees C / 87 degrees F
Exhaust-Zone1 Temperature  22 degrees C / 71 degrees F
IntakeA-Zone0 Temperature  21 degrees C / 69 degrees F
IntakeB-Zone1 Temperature  16 degrees C / 60 degrees F
Exhaust-Zone0 Temperature  23 degrees C / 73 degrees F
SFB-XF2-Zone1 Temperature  30 degrees C / 86 degrees F
SFB-XF1-Zone0 Temperature  28 degrees C / 82 degrees F
SFB-XF0-Zone0 Temperature  38 degrees C / 100 degrees F

```

```

Power
LTC3880-XF2-1.5v-RAIL      1500 mV
LTC3880-XF2-1.5v-CH0       1500 mV
LTC3880-XF2-1.5v-CH1       1500 mV
LTC3880-XF2-1.0v-RAIL      949 mV
LTC3880-XF2-1.0v-CH0       949 mV
LTC3880-XF2-1.0v-CH1       951 mV
LTC3880-XF1-1.5v-RAIL      1499 mV
LTC3880-XF1-1.5v-CH0       1499 mV
LTC3880-XF1-1.5v-CH1       1500 mV
LTC3880-XF1-1.0v-RAIL      949 mV
LTC3880-XF1-1.0v-CH0       949 mV
LTC3880-XF1-1.0v-CH1       951 mV
LTC3880-XF0-1.5v-RAIL      1499 mV
LTC3880-XF0-1.5v-CH0       1499 mV
LTC3880-XF0-1.5v-CH1       1500 mV
LTC3880-XF0-1.0v-RAIL      1029 mV
LTC3880-XF0-1.0v-CH0       1029 mV
LTC3880-XF0-1.0v-CH1       1032 mV
LTC3880-3.3v-RAIL          3300 mV
LTC3880-3.3v-CH0           3300 mV
LTC3880-3.3v-CH1           3299 mV

SFB 1 status:
State      Online
Intake-Zone0 Temperature 32 degrees C / 89 degrees F
Exhaust-Zone1 Temperature 20 degrees C / 68 degrees F
IntakeA-Zone0 Temperature 25 degrees C / 77 degrees F
IntakeB-Zone1 Temperature 15 degrees C / 59 degrees F
Exhaust-Zone0 Temperature 24 degrees C / 75 degrees F
SFB-XF2-Zone1 Temperature 31 degrees C / 87 degrees F
SFB-XF1-Zone0 Temperature 31 degrees C / 87 degrees F
SFB-XF0-Zone0 Temperature 37 degrees C / 98 degrees F

Power
LTC3880-XF2-1.5v-RAIL      1499 mV
LTC3880-XF2-1.5v-CH0       1499 mV
LTC3880-XF2-1.5v-CH1       1500 mV
LTC3880-XF2-1.0v-RAIL      1029 mV
LTC3880-XF2-1.0v-CH0       1029 mV
LTC3880-XF2-1.0v-CH1       1031 mV
LTC3880-XF1-1.5v-RAIL      1499 mV
LTC3880-XF1-1.5v-CH0       1499 mV
LTC3880-XF1-1.5v-CH1       1500 mV
LTC3880-XF1-1.0v-RAIL      1029 mV
LTC3880-XF1-1.0v-CH0       1029 mV
LTC3880-XF1-1.0v-CH1       1031 mV
LTC3880-XF0-1.5v-RAIL      1500 mV
LTC3880-XF0-1.5v-CH0       1500 mV
LTC3880-XF0-1.5v-CH1       1500 mV
LTC3880-XF0-1.0v-RAIL      1029 mV
LTC3880-XF0-1.0v-CH0       1029 mV
LTC3880-XF0-1.0v-CH1       1032 mV
LTC3880-3.3v-RAIL          3299 mV
LTC3880-3.3v-CH0           3299 mV
LTC3880-3.3v-CH1           3299 mV

SFB 2 status:
State      Online
Intake-Zone0 Temperature 26 degrees C / 78 degrees F
Exhaust-Zone1 Temperature 19 degrees C / 66 degrees F
IntakeA-Zone0 Temperature 23 degrees C / 73 degrees F
IntakeB-Zone1 Temperature 15 degrees C / 59 degrees F

```

```

Exhaust-Zone0 Temperature 21 degrees C / 69 degrees F
SFB-XF2-Zone1 Temperature 29 degrees C / 84 degrees F
SFB-XF1-Zone0 Temperature 26 degrees C / 78 degrees F
SFB-XF0-Zone0 Temperature 31 degrees C / 87 degrees F
Power
  LTC3880-XF2-1.5v-RAIL 1500 mV
  LTC3880-XF2-1.5v-CH0 1500 mV
  LTC3880-XF2-1.5v-CH1 1500 mV
  LTC3880-XF2-1.0v-RAIL 1029 mV
  LTC3880-XF2-1.0v-CH0 1029 mV
  LTC3880-XF2-1.0v-CH1 1031 mV
  LTC3880-XF1-1.5v-RAIL 1499 mV
  LTC3880-XF1-1.5v-CH0 1499 mV
  LTC3880-XF1-1.5v-CH1 1500 mV
  LTC3880-XF1-1.0v-RAIL 1030 mV
  LTC3880-XF1-1.0v-CH0 1030 mV
  LTC3880-XF1-1.0v-CH1 1031 mV
  LTC3880-XF0-1.5v-RAIL 1499 mV
  LTC3880-XF0-1.5v-CH0 1499 mV
  LTC3880-XF0-1.5v-CH1 1500 mV
  LTC3880-XF0-1.0v-RAIL 1029 mV
  LTC3880-XF0-1.0v-CH0 1029 mV
  LTC3880-XF0-1.0v-CH1 1032 mV
  LTC3880-3.3v-RAIL 3300 mV
  LTC3880-3.3v-CH0 3300 mV
  LTC3880-3.3v-CH1 3300 mV
SFB 3 status:
  State Offline
  Reason No power
SFB 4 status:
  State Online
  Intake-Zone0 Temperature 33 degrees C / 91 degrees F
  Exhaust-Zone1 Temperature 21 degrees C / 69 degrees F
  IntakeA-Zone0 Temperature 24 degrees C / 75 degrees F
  IntakeB-Zone1 Temperature 17 degrees C / 62 degrees F
  Exhaust-Zone0 Temperature 24 degrees C / 75 degrees F
  SFB-XF2-Zone1 Temperature 32 degrees C / 89 degrees F
  SFB-XF1-Zone0 Temperature 32 degrees C / 89 degrees F
  SFB-XF0-Zone0 Temperature 37 degrees C / 98 degrees F
Power
  LTC3880-XF2-1.5v-RAIL 1499 mV
  LTC3880-XF2-1.5v-CH0 1499 mV
  LTC3880-XF2-1.5v-CH1 1500 mV
  LTC3880-XF2-1.0v-RAIL 949 mV
  LTC3880-XF2-1.0v-CH0 949 mV
  LTC3880-XF2-1.0v-CH1 952 mV
  LTC3880-XF1-1.5v-RAIL 1500 mV
  LTC3880-XF1-1.5v-CH0 1500 mV
  LTC3880-XF1-1.5v-CH1 1500 mV
  LTC3880-XF1-1.0v-RAIL 1029 mV
  LTC3880-XF1-1.0v-CH0 1029 mV
  LTC3880-XF1-1.0v-CH1 1031 mV
  LTC3880-XF0-1.5v-RAIL 1499 mV
  LTC3880-XF0-1.5v-CH0 1499 mV
  LTC3880-XF0-1.5v-CH1 1500 mV
  LTC3880-XF0-1.0v-RAIL 949 mV
  LTC3880-XF0-1.0v-CH0 949 mV
  LTC3880-XF0-1.0v-CH1 952 mV
  LTC3880-3.3v-RAIL 3299 mV
  LTC3880-3.3v-CH0 3299 mV

```

```

LTC3880-3.3v-CH1          3299 mV
SFB 5 status:
State                      Online
Intake-Zone0 Temperature  27 degrees C / 80 degrees F
Exhaust-Zone1 Temperature 20 degrees C / 68 degrees F
IntakeA-Zone0 Temperature 23 degrees C / 73 degrees F
IntakeB-Zone1 Temperature 15 degrees C / 59 degrees F
Exhaust-Zone0 Temperature 22 degrees C / 71 degrees F
SFB-XF2-Zone1 Temperature 27 degrees C / 80 degrees F
SFB-XF1-Zone0 Temperature 34 degrees C / 93 degrees F
SFB-XF0-Zone0 Temperature 32 degrees C / 89 degrees F
Power
LTC3880-XF2-1.5v-RAIL     1500 mV
LTC3880-XF2-1.5v-CH0      1500 mV
LTC3880-XF2-1.5v-CH1      1500 mV
LTC3880-XF2-1.0v-RAIL     949 mV
LTC3880-XF2-1.0v-CH0      949 mV
LTC3880-XF2-1.0v-CH1      951 mV
LTC3880-XF1-1.5v-RAIL     1499 mV
LTC3880-XF1-1.5v-CH0      1499 mV
LTC3880-XF1-1.5v-CH1      1500 mV
LTC3880-XF1-1.0v-RAIL     949 mV
LTC3880-XF1-1.0v-CH0      949 mV
LTC3880-XF1-1.0v-CH1      951 mV
LTC3880-XF0-1.5v-RAIL     1499 mV
LTC3880-XF0-1.5v-CH0      1499 mV
LTC3880-XF0-1.5v-CH1      1500 mV
LTC3880-XF0-1.0v-RAIL     1029 mV
LTC3880-XF0-1.0v-CH0      1029 mV
LTC3880-XF0-1.0v-CH1      1032 mV
LTC3880-3.3v-RAIL        3299 mV
LTC3880-3.3v-CH0         3299 mV
LTC3880-3.3v-CH1         3299 mV
SFB 6 status:
State                      Online
Intake-Zone0 Temperature  32 degrees C / 89 degrees F
Exhaust-Zone1 Temperature 19 degrees C / 66 degrees F
IntakeA-Zone0 Temperature 24 degrees C / 75 degrees F
IntakeB-Zone1 Temperature 15 degrees C / 59 degrees F
Exhaust-Zone0 Temperature 25 degrees C / 77 degrees F
SFB-XF2-Zone1 Temperature 29 degrees C / 84 degrees F
SFB-XF1-Zone0 Temperature 37 degrees C / 98 degrees F
SFB-XF0-Zone0 Temperature 39 degrees C / 102 degrees F
Power
LTC3880-XF2-1.5v-RAIL     1500 mV
LTC3880-XF2-1.5v-CH0      1500 mV
LTC3880-XF2-1.5v-CH1      1500 mV
LTC3880-XF2-1.0v-RAIL     1029 mV
LTC3880-XF2-1.0v-CH0      1029 mV
LTC3880-XF2-1.0v-CH1      1031 mV
LTC3880-XF1-1.5v-RAIL     1499 mV
LTC3880-XF1-1.5v-CH0      1499 mV
LTC3880-XF1-1.5v-CH1      1500 mV
LTC3880-XF1-1.0v-RAIL     949 mV
LTC3880-XF1-1.0v-CH0      949 mV
LTC3880-XF1-1.0v-CH1      951 mV
LTC3880-XF0-1.5v-RAIL     1499 mV
LTC3880-XF0-1.5v-CH0      1499 mV
LTC3880-XF0-1.5v-CH1      1500 mV
LTC3880-XF0-1.0v-RAIL     1029 mV

```

```

LTC3880-XF0-1.0v-CH0      1029 mV
LTC3880-XF0-1.0v-CH1      1032 mV
LTC3880-3.3v-RAIL         3300 mV
LTC3880-3.3v-CH0          3300 mV
LTC3880-3.3v-CH1          3299 mV
SFB 7 status:
State                      Online
Intake-Zone0 Temperature   31 degrees C / 87 degrees F
Exhaust-Zone1 Temperature  18 degrees C / 64 degrees F
IntakeA-Zone0 Temperature  20 degrees C / 68 degrees F
IntakeB-Zone1 Temperature  13 degrees C / 55 degrees F
Exhaust-Zone0 Temperature  22 degrees C / 71 degrees F
SFB-XF2-Zone1 Temperature  27 degrees C / 80 degrees F
SFB-XF1-Zone0 Temperature  26 degrees C / 78 degrees F
SFB-XF0-Zone0 Temperature  39 degrees C / 102 degrees F
Power
LTC3880-XF2-1.5v-RAIL     1499 mV
LTC3880-XF2-1.5v-CH0      1499 mV
LTC3880-XF2-1.5v-CH1      1500 mV
LTC3880-XF2-1.0v-RAIL     1029 mV
LTC3880-XF2-1.0v-CH0      1029 mV
LTC3880-XF2-1.0v-CH1      1031 mV
LTC3880-XF1-1.5v-RAIL     1499 mV
LTC3880-XF1-1.5v-CH0      1499 mV
LTC3880-XF1-1.5v-CH1      1500 mV
LTC3880-XF1-1.0v-RAIL     1029 mV
LTC3880-XF1-1.0v-CH0      1029 mV
LTC3880-XF1-1.0v-CH1      1031 mV
LTC3880-XF0-1.5v-RAIL     1500 mV
LTC3880-XF0-1.5v-CH0      1500 mV
LTC3880-XF0-1.5v-CH1      1500 mV
LTC3880-XF0-1.0v-RAIL     1029 mV
LTC3880-XF0-1.0v-CH0      1029 mV
LTC3880-XF0-1.0v-CH1      1031 mV
LTC3880-3.3v-RAIL         3300 mV
LTC3880-3.3v-CH0          3300 mV
LTC3880-3.3v-CH1          3299 mV

```

### show chassis environment sfb (MX2008 Router)

```
user@host> show chassis environment sfb
```

```

SFB 0 status:
State                      Online
Inlet1 Temperature         26 degrees C / 78 degrees F
Inlet2 Temperature         27 degrees C / 80 degrees F
Exhaust1 Temperature       26 degrees C / 78 degrees F
Exhaust2 Temperature       28 degrees C / 82 degrees F
SFB2-PF-local Temperature  27 degrees C / 80 degrees F
SFB2-PF-die Temperature    33 degrees C / 91 degrees F
Power
SFB2-PF0-1.0V-PLL          1008 mV
SFB2-1.0V                  988 mV
SFB2-10.8V                 10727 mV
SFB2-1.5V                  1491 mV
SFB2-PF0-1.8V              1782 mV
SFB2-2.5V                  2475 mV
SFB2-Bias-5V               5535 mV

```



```

SFB2-3.3V-Main          3294 mV
SFB2-1.8V               1798 mV
MAX20751-PF0-0.9v      974 mV
MAX20751-PF0-1.0v      1020 mV
SFB 1 status:
State                   Online
Inlet1 Temperature     26 degrees C / 78 degrees F
Inlet2 Temperature     29 degrees C / 84 degrees F
Exhaust1 Temperature   26 degrees C / 78 degrees F
Exhaust2 Temperature   29 degrees C / 84 degrees F
SFB2-PF-local Temperature 29 degrees C / 84 degrees F
SFB2-PF-die Temperature 41 degrees C / 105 degrees F
Power
SFB2-PF0-1.0V-PLL      1014 mV
SFB2-1.0V              994 mV
SFB2-10.8V             10746 mV
SFB2-1.5V              1495 mV
SFB2-PF0-1.8V          1814 mV
SFB2-2.5V              2478 mV
SFB2-Bias-5V           5594 mV
SFB2-3.3V-Main         3306 mV
SFB2-1.8V              1774 mV
MAX20751-PF0-0.9v      974 mV
MAX20751-PF0-1.0v      1020 mV
SFB 2 status:
State                   Online
Inlet1 Temperature     29 degrees C / 84 degrees F
Inlet2 Temperature     36 degrees C / 96 degrees F
Exhaust1 Temperature   27 degrees C / 80 degrees F
Exhaust2 Temperature   34 degrees C / 93 degrees F
SFB2-PF-local Temperature 38 degrees C / 100 degrees F
SFB2-PF-die Temperature 40 degrees C / 104 degrees F
Power
SFB2-PF0-1.0V-PLL      1010 mV
SFB2-1.0V              994 mV
SFB2-10.8V             10805 mV
SFB2-1.5V              1495 mV
SFB2-PF0-1.8V          1804 mV
SFB2-2.5V              2475 mV
SFB2-Bias-5V           5562 mV

SFB2-3.3V-Main         3302 mV
SFB2-1.8V              1788 mV
MAX20751-PF0-0.9v      974 mV
MAX20751-PF0-1.0v      1020

```

### show chassis environment sfb (MX10008 Router)

```
user@host> show chassis environment sfb
```

```

SFB 0 status:
State                   Online
Intake-A Temperature    33 degrees C / 91 degrees F
Intake-B Temperature    22 degrees C / 71 degrees F
Exhaust-A Temperature   27 degrees C / 80 degrees F
Exhaust-B Temperature   32 degrees C / 89 degrees F
PF0 Temperature         38 degrees C / 100 degrees F
PF1 Temperature         29 degrees C / 84 degrees F
Power
PF0 Core 0.9V           925 mV

```

PF0 AVDD 1V	999 mV
PF1 Core 0.9V	922 mV
PF1 AVDD 1V	1000 mV
12V	12311 mV
SFB 1 status:	
State	Online
Intake-A Temperature	43 degrees C / 109 degrees F
Intake-B Temperature	21 degrees C / 69 degrees F
Exhaust-A Temperature	25 degrees C / 77 degrees F
Exhaust-B Temperature	43 degrees C / 109 degrees F
PF0 Temperature	49 degrees C / 120 degrees F
PF1 Temperature	29 degrees C / 84 degrees F
Power	
PF0 Core 0.9V	951 mV
PF0 AVDD 1V	1000 mV
PF1 Core 0.9V	924 mV
PF1 AVDD 1V	1000 mV
12V	12311 mV
SFB 2 status:	
State	Online
Intake-A Temperature	39 degrees C / 102 degrees F
Intake-B Temperature	21 degrees C / 69 degrees F
Exhaust-A Temperature	25 degrees C / 77 degrees F
Exhaust-B Temperature	38 degrees C / 100 degrees F
PF0 Temperature	44 degrees C / 111 degrees F
PF1 Temperature	30 degrees C / 86 degrees F
Power	
PF0 Core 0.9V	923 mV
PF0 AVDD 1V	1000 mV
PF1 Core 0.9V	925 mV
PF1 AVDD 1V	999 mV
12V	12364 mV
SFB 3 status:	
State	Online
Intake-A Temperature	37 degrees C / 98 degrees F
Intake-B Temperature	21 degrees C / 69 degrees F
Exhaust-A Temperature	26 degrees C / 78 degrees F
Exhaust-B Temperature	34 degrees C / 93 degrees F
PF0 Temperature	41 degrees C / 105 degrees F
PF1 Temperature	29 degrees C / 84 degrees F
Power	
PF0 Core 0.9V	925 mV
PF0 AVDD 1V	1000 mV
PF1 Core 0.9V	923 mV
PF1 AVDD 1V	1000 mV
12V	12285 mV
SFB 4 status:	
State	Online
Intake-A Temperature	30 degrees C / 86 degrees F
Intake-B Temperature	20 degrees C / 68 degrees F
Exhaust-A Temperature	25 degrees C / 77 degrees F
Exhaust-B Temperature	31 degrees C / 87 degrees F
PF0 Temperature	40 degrees C / 104 degrees F
PF1 Temperature	29 degrees C / 84 degrees F
Power	
PF0 Core 0.9V	951 mV
PF0 AVDD 1V	1000 mV
PF1 Core 0.9V	948 mV
PF1 AVDD 1V	999 mV
12V	12193 mV

## SFB 5 status:

State	Online	
Intake-A Temperature		30 degrees C / 86 degrees F
Intake-B Temperature		21 degrees C / 69 degrees F
Exhaust-A Temperature		26 degrees C / 78 degrees F
Exhaust-B Temperature		30 degrees C / 86 degrees F
PF0 Temperature		34 degrees C / 93 degrees F
PF1 Temperature		33 degrees C / 91 degrees F
Power		
PF0 Core 0.9V	951 mV	
PF0 AVDD 1V	1000 mV	
PF1 Core 0.9V	948 mV	
PF1 AVDD 1V	999 mV	
12V	12166 mV	

## show chassis environment sfm

<b>Syntax</b>	<code>show chassis environment sfm &lt;slot&gt;</code>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	(M40e and M160 routers only) Display Switching and Forwarding Module (SFM) environmental information.
<b>Options</b>	<p><b>none</b>—Display environmental information about all SFMs.</p> <p><b>slot</b>—(Optional) Display environmental information about an individual SFM. Replace <b>slot</b> with a value from <b>0</b> through <b>3</b>.</p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">request chassis sfm on page 897</a></li> <li>• <a href="#">request chassis sfm master switch on page 895</a></li> <li>• <i>Configuring SFM Redundancy on M40e and M160 Routers</i></li> <li>• <i>Switching the Global Master and Backup Roles in a Virtual Chassis Configuration</i></li> </ul>
<b>List of Sample Output</b>	<a href="#">show chassis environment sfm (M40e Router) on page 1268</a> <a href="#">show chassis environment sfm (M160 Router) on page 1268</a>
<b>Output Fields</b>	Table 115 on page 1266 lists the output fields for the <b>show chassis environment sfm</b> command. Output fields are listed in the approximate order in which they appear.

Table 115: show chassis environment sfm Output Fields

Field Name	Field Description
<b>SFM slot status</b>	SFM slot number: <b>0</b> or <b>1</b> on an M40e router, or <b>0</b> , <b>1</b> , <b>2</b> , or <b>3</b> on an M160 router.
<b>State</b>	<p>Status of the SFM:</p> <ul style="list-style-type: none"> <li>• <b>Online</b>—SFM is online and running.</li> <li>• <b>Offline</b>—SFM is powered down.</li> </ul> <p>If two SFMs are installed and online, one is functioning as the master, and the other is marked as the <b>Standby</b>.</p>
<b>SPP Temperature</b>	Temperature of the air flowing past the Switch Plane Processor card.
<b>SPR Temperature</b>	Temperature of the air flowing past the Switch Plane Router card.

*Table 115: show chassis environment sfm Output Fields (continued)*

Field Name	Field Description
<b>SPP Power</b>	Information about the voltage supplied to the Switch Plane Processor card. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
<b>SPR Power</b>	Information about the voltage supplied to the Switch Plane Router. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.
<b>CMB Revision</b>	Revision level of the Chassis Management Bus (CMB) device.

## Sample Output

### show chassis environment sfm (M40e Router)

```
user@host> show chassis environment sfm

SFM 0 status:
  State                Online
  SPP temperature       40 degrees C / 104 degrees F
  SPR temperature       44 degrees C / 111 degrees F
  SPP Power:
    1.5 V               1501 mV
    2.5 V               2472 mV
    3.3 V               3293 mV
    5.0 V               5028 mV
    5.0 V bias          4964 mV
  SPR Power:
    1.5 V               1501 mV
    2.5 V               2483 mV
    3.3 V               3308 mV
    5.0 V               5035 mV
    5.0 V bias          4981 mV
    8.0 V bias          8239 mV
  CMB Revision          12

SFM 1 status:
  State                Online - Standby
  SPP temperature       43 degrees C / 109 degrees F
  SPR temperature       45 degrees C / 113 degrees F
  SPP Power:
    1.5 V               1503 mV
    2.5 V               2483 mV
    3.3 V               3284 mV
    5.0 V               5045 mV
    5.0 V bias          4993 mV
  SPR Power:
    1.5 V               1498 mV
    2.5 V               2472 mV
    3.3 V               3284 mV
    5.0 V               5035 mV
    5.0 V bias          4991 mV
    8.0 V bias          8231 mV
  CMB Revision          12
```

### show chassis environment sfm (M160 Router)

```
user@host> show chassis environment sfm

SFM 0 status:
  State                Online
  SPP temperature       43 degrees C / 109 degrees F
  SPR temperature       44 degrees C / 111 degrees F
  SPP Power:
    1.5 V               1504 mV
    2.5 V               2474 mV
    3.3 V               3290 mV
    5.0 V               5015 mV
    5.0 V bias          4962 mV
  SPR Power:
    1.5 V               1498 mV
    2.5 V               2482 mV
```

```

3.3 V          3299 mV
5.0 V          5020 mV
5.0 V bias     4971 mV
8.0 V bias     8229 mV
CMB Revision   12
SFM 1 status:
State          Online
SPP temperature 47 degrees C / 116 degrees F
SPR temperature 50 degrees C / 122 degrees F
SPP Power:
1.5 V          1499 mV
2.5 V          2466 mV
3.3 V          3274 mV
5.0 V          5025 mV
5.0 V bias     4984 mV
SPR Power:
1.5 V          1496 mV
2.5 V          2470 mV
3.3 V          3279 mV
5.0 V          5020 mV
5.0 V bias     4993 mV
8.0 V bias     8222 mV
CMB Revision   12
SFM 2 status:
State          Online
SPP temperature 50 degrees C / 122 degrees F
SPR temperature 52 degrees C / 125 degrees F
SPP Power:
1.5 V          1504 mV
2.5 V          2471 mV
3.3 V          3294 mV
5.0 V          5045 mV
5.0 V bias     4981 mV
SPR Power:
1.5 V          1496 mV
2.5 V          2470 mV
3.3 V          3293 mV
5.0 V          5028 mV
5.0 V bias     4971 mV
8.0 V bias     8214 mV
CMB Revision   12
SFM 3 status:
State          Online
SPP temperature 49 degrees C / 120 degrees F
SPR temperature 48 degrees C / 118 degrees F
SPP Power:
1.5 V          1505 mV
2.5 V          2484 mV
3.3 V          3296 mV
5.0 V          5040 mV
5.0 V bias     4984 mV
SPR Power:
1.5 V          1503 mV
2.5 V          2488 mV
3.3 V          3302 mV
5.0 V          5037 mV
5.0 V bias     4993 mV
8.0 V bias     8249 mV
CMB Revision   12

```





## show chassis environment sib

<b>List of Syntax</b>	<a href="#">Syntax on page 1271</a> <a href="#">Syntax (TX Matrix router) on page 1271</a> <a href="#">Syntax (TX Matrix Plus Router) on page 1271</a>
<b>Syntax</b>	show chassis environment sib <slot>
<b>Syntax (TX Matrix router)</b>	show chassis environment sib <lcc number   scc   slot>
<b>Syntax (TX Matrix Plus Router)</b>	show chassis environment sib <sib-slot   lcc number   sfc number   f13 sib-slot   f2s sib-slot/sib-f2s-slot-number>
<b>Release Information</b>	<p>Command introduced before Junos OS Release 7.4.</p> <p><b>sfc</b> option introduced in Junos OS Release 9.6. for the TX Matrix Plus router.</p> <p>Command introduced in Junos OS 12.1X48 for PTX Series Packet Transport Routers.</p> <p>Command introduced in Junos OS 12.1 for T4000 Core Routers.</p> <p>Command introduced in Junos OS Release 17.2 for PTX10008 Routers.</p>
<b>Description</b>	Display Switch Interface Board (SIB) environmental information.
<b>Options</b>	<p><b>none</b>—Display environmental information about all SIBs. On a TX Matrix router, display environmental information about all SIBs on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display environmental information about all SIBs on the TX Matrix Plus router and its attached routers .</p> <p><b>f13 sib-slot</b>—(TX Matrix Plus routers only) (Optional) Display SIB F13 environmental information only. Replace <b>sib-slot</b> with one of the following values: <b>0, 1, 3, 4, 6, 7, 8, 9, 11, or 12</b>. (Slots 2, 5, 10, 13, 14, and 15 are unused).</p> <p><b>f2s sib-slot/sib-f2s-slot-number</b>—(TX Matrix Plus routers only) (Optional) Display SIB F2s environmental information only. Replace <b>sib-slot</b> with a value from <b>0</b> through <b>4</b>, followed by a <b>sib-f2s-slot-number</b> value of <b>0, 2, 4 or 6</b>.</p> <p><b>lcc number</b>—(TX Matrix router, and TX Matrix Plus router only) (Optional) Line-card chassis number.</p> <p>Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> <li>• 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.</li> <li>• 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.</li> </ul>

- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**scc**—(TX Matrix routers only) (Optional) Display environmental information about the SIB in the TX Matrix router (switch-card chassis).

**sfc**—(TX Matrix Plus routers only) (Optional) On a TX Matrix Plus router, display environmental information about the SIB in the TX Matrix Plus router (switch-fabric chassis).

**sib-slot**—(Optional) Display environmental information about the specified SIB. For the M320 router, replace **sib-slot** with a value from 0 through 3. For the T640, T1600, T4000, and TX Matrix routers, replace **sib-slot** with a value from 0 through 4. For the TX Matrix Plus router, see `f13 sib-slot` and `f2s sib-slot/sib-f2s-slot-number`. For the T320 router, replace **sib-slot** with a value from 0 through 2. For the PTX5000 Packet Transport Router, replace **sib-slot** with a value from 0 through 8.

**Required Privilege Level** view

**Related Documentation**

- [request chassis sib on page 898](#)
- [show chassis sibs on page 2124](#)
- [Configuring Junos OS to Upgrade and Downgrade Switch Interface Boards on a TX Matrix Router on page 379](#)
- [M320 SIB Description](#)

**List of Sample Output**

[show chassis environment sib \(M320 Router\) on page 1273](#)  
[show chassis environment sib 1 \(T640 Router\) on page 1274](#)  
[show chassis environment sib 1 \(T4000 Router\) on page 1274](#)  
[show chassis environment sib scc \(TX Matrix Router\) on page 1275](#)  
[show chassis environment sib \(TX Matrix Plus Router\) on page 1276](#)  
[show chassis environment sib sfc \(TX Matrix Plus Router\) on page 1286](#)  
[show chassis environment sib f13 \(TX Matrix Plus Router\) on page 1291](#)  
[show chassis environment sib f2s \(TX Matrix Plus Router\) on page 1292](#)  
[show chassis environment sib \(TX Matrix Plus router with 3D SIBs\) on page 1292](#)  
[show chassis environment sib \(PTX5000 Packet Transport Router with SIB-I-8S\) on page 1294](#)  
[show chassis environment sib \(PTX5000 Packet Transport Router with SIB-I-8SE\) on page 1297](#)  
[show chassis environment sib \(PTX10008 Router\) on page 1299](#)  
[show chassis environment sib \(PTX10016 Router\) on page 1300](#)

**Output Fields** Table 116 on page 1273 lists the output fields for the **show chassis environment sib** command. Output fields are listed in the approximate order in which they appear.

Table 116: show chassis environment sib Output Fields

Field Name	Field Description
<b>SIB slot status</b>	<p>SIB slot number:</p> <ul style="list-style-type: none"> <li>• 0 through 3 on an M320 router.</li> <li>• 0 or 2 on a T320 router.</li> <li>• 0 through 4 on a T640, T1600, T4000, or TX Matrix router.</li> <li>• 0, 1, 3, 4, 6, 7, 8, 9, 11, or 12 for F13 SIBs on a TX Matrix Plus router. (Slots 2, 5, 10, 13, 14, and 15 are unused).</li> <li>• 0 through 4, followed by 0, 2, 4, or 6 for F2S SIBs on a TX Matrix Plus router. For example, <b>SIB F2S 0/4</b>.</li> <li>• 0 through 8 on a PTX5000 Packet Transport Router.</li> </ul>
<b>State</b>	<p>Status of the SIB:</p> <ul style="list-style-type: none"> <li>• <b>Online</b>—SIB is online and running.</li> <li>• <b>Offline</b>—SIB is powered down.</li> <li>• <b>Spare</b> (T640, T1600, T4000, and TX Matrix routers only)—SIB is redundant and will move to active state if one of the working SIBs fails.</li> </ul> <p>Only four of the SIBs are active at any time. The fifth one is marked <b>Spare</b>. It is activated if there is a fault on one of the active SIBs.</p> <p>Online standby (TX Matrix Plus router only).</p>
<b>Temperature</b>	<p>Temperature of the air flowing past the SIB.</p> <p>On PTX Series Packet Transport Routers, separate temperatures are displayed for <b>Intake</b>, <b>Exhaust</b>, and <b>Junction</b>.</p>
<b>Power</b>	<p>Information about the voltage supplied to the SIB. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.</p>

## Sample Output

### show chassis environment sib (M320 Router)

```

user@host> show chassis environment sib

SIB 0 status:
State                Online
Temperature          34 degrees C / 93 degrees F
Power:
  GROUND              0 mV
  1.8 V               1805 mV
  2.5 V               2498 mV
  3.3 V               3306 mV
  1.8 V bias          1789 mV
  3.3 V bias          3299 mV
  5.0 V bias          5003 mV
  8.0 V bias          7374 mV

```

```

SIB 1 status:
State                Online
Temperature          35 degrees C / 95 degrees F
Power:
  GROUND             0 mV
  1.8 V              1814 mV
  2.5 V              2477 mV
  3.3 V              3319 mV
  1.8 V bias         1792 mV
  3.3 V bias         3291 mV
  5.0 V bias         4981 mV
  8.0 V bias         7335 mV
SIB 2 status:
State                Online
Temperature          33 degrees C / 91 degrees F
Power:
  GROUND             0 mV
  1.8 V              1811 mV
  2.5 V              2489 mV
  3.3 V              3330 mV
  1.8 V bias         1797 mV
  3.3 V bias         3304 mV
  5.0 V bias         5025 mV
  8.0 V bias         7330 mV
SIB 3 status:
State                Online
Temperature          37 degrees C / 98 degrees F
Power:
  GROUND             0 mV
  1.8 V              1798 mV
  2.5 V              2481 mV
  3.3 V              3328 mV
  1.8 V bias         1792 mV
  3.3 V bias         3313 mV
  5.0 V bias         5013 mV
  8.0 V bias         7467 mV

```

### show chassis environment sib 1 (T640 Router)

```
user@host> show chassis environment sib 1
```

```

SIB 1 status:
State                Online
Temperature          39 degrees C / 102 degrees F
Power:
  GROUND             0 mV
  1.8 V              1809 mV
  2.5 V              2478 mV
  3.3 V              3308 mV
  1.8 V bias         1794 mV
  3.3 V bias         3274 mV
  5.0 V bias         4996 mV
  8.0 V bias         7247 mV

```

### show chassis environment sib 1 (T4000 Router)

```
user@host> show chassis environment sib 1
```

```

SIB 1 status:
State                Online
Temperature          42 degrees C / 107 degrees F
Power
  8.0 V bias         8100 mV
  3.3 V bias         3284 mV
  0.9 V bias         904 mV
  1.1 V bias         1090 mV
  1.5 V bias         1488 mV
  2.5 V bias         2504 mV
  9.0 V              8940 mV
  3.3 V              3288 mV
  XF0 1.0 V          998 mV
  XF0 1.0 V LDO      994 mV
  PCIe SW 1.0 V      990 mV
  XF0 1.8 V          1788 mV
  XF1 1.0 V          1002 mV
  XF2 1.0 V          1002 mV
  XF3 1.0 V          998 mV
  1.2 V              1194 mV
  XF1 1.0 V LDO      1000 mV
  XF2 1.0 V LDO      998 mV
  XF3 1.0 V LDO      998 mV
  XF1 1.8 V          1798 mV
  XF2 1.8 V          1800 mV
  XF3 1.8 V          1794 mV
  1.5 V              1488 mV
  SW 3.3 V           3320 mV

```

#### show chassis environment sib scc (TX Matrix Router)

```

user@host> show chassis environment sib scc

scc-re0:
-----
SIB 3 status:
State                Offline
Reason              Offlined by button press
Temperature          0 degrees C / 32 degrees F
Power:
  GROUND             0 mV
  1.8 V              0 mV
  2.5 V              0 mV
  3.3 V              0 mV
  1.8 V bias         0 mV
  3.3 V bias         0 mV
  5.0 V bias         0 mV
  8.0 V bias         0 mV
SIB 4 status:
State                Online
Temperature          42 degrees C / 107 degrees F
Temperature (B)      41 degrees C / 105 degrees F
Power:
  GROUND             0 mV
  1.8 V              1787 mV
  2.5 V              2488 mV
  3.3 V              3294 mV
  1.8 V bias         1787 mV
  3.3 V bias         3306 mV
  5.0 V bias         5010 mV

```

8.0 V bias	7418 mV
Power (B):	
GROUND	0 mV
1.8 V	1785 mV
2.5 V	2485 mV
3.3 V	3289 mV
1.8 V bias	1799 mV
3.3 V bias	3284 mV
5.0 V bias	4979 mV
8.0 V bias	7882 mV

### show chassis environment sib (TX Matrix Plus Router)

```
user@host> show chassis environment sib
```

```
sfc0-re0:
```

```
-----
```

```
SIB F13 0 status:
```

State	Online - Standby
Temperature	54 degrees C / 129 degrees F
Temperature (B)	50 degrees C / 122 degrees F
Power	
1.2 V_0	1205 mV
1.2 V_1	1202 mV
1.2 V_2	1205 mV
1.2 V_3	1208 mV
1.5 V_0	1501 mV
1.5 V_1	1508 mV
1.8 V	1798 mV
2.5 V	2510 mV
3.3 V	3312 mV
9.0 V	8991 mV
9.0 V bias	0 mV
Power (B)	
2.5 V	2510 mV
3.3 V	3318 mV
9.0 V	9024 mV

```
SIB F13 1 status:
```

State	Online - Standby
Temperature	45 degrees C / 113 degrees F
Temperature (B)	42 degrees C / 107 degrees F
Power	
1.2 V_0	1202 mV
1.2 V_1	1198 mV
1.2 V_2	1202 mV
1.2 V_3	1202 mV
1.5 V_0	1498 mV
1.5 V_1	1501 mV
1.8 V	1811 mV
2.5 V	2504 mV
3.3 V	3292 mV
9.0 V	8991 mV
9.0 V bias	0 mV
Power (B)	
2.5 V	2507 mV
3.3 V	3306 mV
9.0 V	8970 mV

```
SIB F13 3 status:
```

State	Online
Temperature	48 degrees C / 118 degrees F

```

Temperature (B)          44 degrees C / 111 degrees F
Power
  1.2 V_0                1205 mV
  1.2 V_1                1202 mV
  1.2 V_2                1202 mV
  1.2 V_3                1202 mV
  1.5 V_0                1508 mV
  1.5 V_1                1504 mV
  1.8 V                  1798 mV
  2.5 V                  2520 mV
  3.3 V                  3300 mV
  9.0 V                  9009 mV
  9.0 V bias             0 mV
Power (B)
  2.5 V                  2504 mV
  3.3 V                  3312 mV
  9.0 V                  9006 mV
SIB F13 4 status:
State                    Online
Temperature              44 degrees C / 111 degrees F
Temperature (B)          40 degrees C / 104 degrees F
Power
  1.2 V_0                1205 mV
  1.2 V_1                1205 mV
  1.2 V_2                1202 mV
  1.2 V_3                1205 mV
  1.5 V_0                1508 mV
  1.5 V_1                1508 mV
  1.8 V                  1811 mV
  2.5 V                  2510 mV
  3.3 V                  3312 mV
  9.0 V                  8970 mV
  9.0 V bias             0 mV
Power (B)
  2.5 V                  2513 mV
  3.3 V                  3318 mV
  9.0 V                  9048 mV
SIB F13 6 status:
State                    Online
Temperature              50 degrees C / 122 degrees F
Temperature (B)          46 degrees C / 114 degrees F
Power
  1.2 V_0                1195 mV
  1.2 V_1                1205 mV
  1.2 V_2                1202 mV
  1.2 V_3                1202 mV
  1.5 V_0                1495 mV
  1.5 V_1                1495 mV
  1.8 V                  1801 mV
  2.5 V                  2494 mV
  3.3 V                  3300 mV
  9.0 V                  8991 mV
  9.0 V bias             0 mV
Power (B)
  2.5 V                  2500 mV
  3.3 V                  3300 mV
  9.0 V                  9006 mV
SIB F13 7 status:
State                    Online
Temperature              52 degrees C / 125 degrees F

```

Temperature (B)	49 degrees C / 120 degrees F
Power	
1.2 V_0	1202 mV
1.2 V_1	1202 mV
1.2 V_2	1198 mV
1.2 V_3	1185 mV
1.5 V_0	1501 mV
1.5 V_1	1492 mV
1.8 V	1795 mV
2.5 V	2491 mV
3.3 V	3286 mV
9.0 V	8892 mV
9.0 V bias	0 mV
Power (B)	
2.5 V	2507 mV
3.3 V	3306 mV
9.0 V	8952 mV
SIB F13 8 status:	
State	Online
Temperature	55 degrees C / 131 degrees F
Temperature (B)	50 degrees C / 122 degrees F
Power	
1.2 V_0	1208 mV
1.2 V_1	1205 mV
1.2 V_2	1205 mV
1.2 V_3	1211 mV
1.5 V_0	1514 mV
1.5 V_1	1508 mV
1.8 V	1807 mV
2.5 V	2516 mV
3.3 V	3324 mV
9.0 V	9027 mV
9.0 V bias	0 mV
Power (B)	
2.5 V	2520 mV
3.3 V	3318 mV
9.0 V	9066 mV
SIB F13 9 status:	
State	Online
Temperature	46 degrees C / 114 degrees F
Temperature (B)	41 degrees C / 105 degrees F
Power	
1.2 V_0	1208 mV
1.2 V_1	1202 mV
1.2 V_2	1208 mV
1.2 V_3	1202 mV
1.5 V_0	1504 mV
1.5 V_1	1504 mV
1.8 V	1817 mV
2.5 V	2516 mV
3.3 V	3312 mV
9.0 V	9009 mV
9.0 V bias	0 mV
Power (B)	
2.5 V	2510 mV
3.3 V	3312 mV
9.0 V	9024 mV
SIB F13 11 status:	
State	Online
Temperature	47 degrees C / 116 degrees F



```

Temperature (B)          42 degrees C / 107 degrees F
Power
  1.2 V_0                1202 mV
  1.2 V_1                1205 mV
  1.2 V_2                1202 mV
  1.2 V_3                1202 mV
  1.5 V_0                1501 mV
  1.5 V_1                1501 mV
  1.8 V                  1801 mV
  2.5 V                  2510 mV
  3.3 V                  3312 mV
  9.0 V                  8979 mV
  9.0 V bias             0 mV
Power (B)
  2.5 V                  2252 mV
  3.3 V                  5014 mV
  9.0 V                  9954 mV
SIB F13 12 status:
State                    Online
Temperature              45 degrees C / 113 degrees F
Temperature (B)         40 degrees C / 104 degrees F
Power
  1.2 V_0                1211 mV
  1.2 V_1                1208 mV
  1.2 V_2                1205 mV
  1.2 V_3                1205 mV
  1.5 V_0                1511 mV
  1.5 V_1                1501 mV
  1.8 V                  1817 mV
  2.5 V                  2504 mV
  3.3 V                  3318 mV
  9.0 V                  9027 mV
  9.0 V bias             0 mV
Power (B)
  2.5 V                  2520 mV
  3.3 V                  3338 mV
  9.0 V                  9006 mV
SIB F2S 0/0 status:
State                    Online - Standby
Temperature              40 degrees C / 104 degrees F
Power
  1.2 V_1                0 mV
  1.2 V_ASF              1198 mV
  1.2 V_ASF_B            1198 mV
  1.2 V_ASF_D            1202 mV
  1.5 V                  1498 mV
  1.8 V                  1814 mV
  3.3 V                  3300 mV
  3.3 V bias             3300 mV
  3.3 V ASF              3286 mV
  9.0 V                  8250 mV
SIB F2S 0/2 status:
State                    Online - Standby
Temperature              40 degrees C / 104 degrees F
Power
  1.2 V_1                0 mV
  1.2 V_ASF              1198 mV
  1.2 V_ASF_B            1195 mV
  1.2 V_ASF_D            1202 mV
  1.5 V                  1498 mV

```

1.8 V	1807 mV
3.3 V	3300 mV
3.3 V bias	3300 mV
3.3 V ASF	3286 mV
9.0 V	8250 mV
SIB F2S 0/4 status:	
State	Online - Standby
Temperature	40 degrees C / 104 degrees F
Power	
1.2 V_1	0 mV
1.2 V_ASF	1202 mV
1.2 V_ASF_B	1198 mV
1.2 V_ASF_D	1202 mV
1.5 V	1504 mV
1.8 V	1817 mV
3.3 V	3300 mV
3.3 V bias	3300 mV
3.3 V ASF	3306 mV
9.0 V	8250 mV
SIB F2S 0/6 status:	
State	Online - Standby
Temperature	39 degrees C / 102 degrees F
Power	
1.2 V_1	0 mV
1.2 V_ASF	1202 mV
1.2 V_ASF_B	1198 mV
1.2 V_ASF_D	1202 mV
1.5 V	1495 mV
1.8 V	1814 mV
3.3 V	3300 mV
3.3 V bias	3300 mV
3.3 V ASF	3280 mV
9.0 V	8250 mV
SIB F2S 1/0 status:	
State	Online
Temperature	39 degrees C / 102 degrees F
Power	
1.2 V_1	0 mV
1.2 V_ASF	1195 mV
1.2 V_ASF_B	1192 mV
1.2 V_ASF_D	1195 mV
1.5 V	1488 mV
1.8 V	1798 mV
3.3 V	3300 mV
3.3 V bias	3300 mV
3.3 V ASF	3280 mV
9.0 V	8250 mV
SIB F2S 1/2 status:	
State	Online
Temperature	39 degrees C / 102 degrees F
Power	
1.2 V_1	0 mV
1.2 V_ASF	1205 mV
1.2 V_ASF_B	1202 mV
1.2 V_ASF_D	1205 mV
1.5 V	1501 mV
1.8 V	1820 mV
3.3 V	3300 mV
3.3 V bias	3300 mV
3.3 V ASF	3306 mV

```

    9.0 V                8250 mV
SIB F2S 1/4 status:
  State                  Online
  Temperature            39 degrees C / 102 degrees F
  Power
    1.2 V_1              0 mV
    1.2 V_ASF            1198 mV
    1.2 V_ASF_B          1195 mV
    1.2 V_ASF_D          1195 mV
    1.5 V                1498 mV
    1.8 V                1811 mV
    3.3 V                3300 mV
    3.3 V bias           3300 mV
    3.3 V ASF            3300 mV
    9.0 V                8250 mV
SIB F2S 1/6 status:
  State                  Online
  Temperature            39 degrees C / 102 degrees F
  Power
    1.2 V_1              0 mV
    1.2 V_ASF            1195 mV
    1.2 V_ASF_B          1195 mV
    1.2 V_ASF_D          1198 mV
    1.5 V                1498 mV
    1.8 V                1807 mV
    3.3 V                3306 mV
    3.3 V bias           3300 mV
    3.3 V ASF            3292 mV
    9.0 V                8250 mV
SIB F2S 2/0 status:
  State                  Online
  Temperature            39 degrees C / 102 degrees F
  Power
    1.2 V_1              0 mV
    1.2 V_ASF            1195 mV
    1.2 V_ASF_B          1195 mV
    1.2 V_ASF_D          1198 mV
    1.5 V                1498 mV
    1.8 V                1804 mV
    3.3 V                3300 mV
    3.3 V bias           3300 mV
    3.3 V ASF            3286 mV
    9.0 V                8250 mV
SIB F2S 2/2 status:
  State                  Online
  Temperature            38 degrees C / 100 degrees F
  Power
    1.2 V_1              0 mV
    1.2 V_ASF            1195 mV
    1.2 V_ASF_B          1195 mV
    1.2 V_ASF_D          1198 mV
    1.5 V                1495 mV
    1.8 V                1807 mV
    3.3 V                3300 mV
    3.3 V bias           3300 mV
    3.3 V ASF            3300 mV
    9.0 V                8250 mV
SIB F2S 2/4 status:
  State                  Online
  Temperature            38 degrees C / 100 degrees F

```

```

Power
  1.2 V_1                0 mV
  1.2 V_ASF              1198 mV
  1.2 V_ASF_B            1195 mV
  1.2 V_ASF_D            1198 mV
  1.5 V                  1501 mV
  1.8 V                  1804 mV
  3.3 V                  3286 mV
  3.3 V bias             3292 mV
  3.3 V ASF              3300 mV
  9.0 V                  8230 mV
SIB F2S 2/6 status:
State                    Online
Temperature              38 degrees C / 100 degrees F
Power
  1.2 V_1                0 mV
  1.2 V_ASF              1202 mV
  1.2 V_ASF_B            1198 mV
  1.2 V_ASF_D            1202 mV
  1.5 V                  1501 mV
  1.8 V                  1817 mV
  3.3 V                  3300 mV
  3.3 V bias             3300 mV
  3.3 V ASF              3318 mV
  9.0 V                  8250 mV
SIB F2S 3/0 status:
State                    Online
Temperature              38 degrees C / 100 degrees F
Power
  1.2 V_1                0 mV
  1.2 V_ASF              1195 mV
  1.2 V_ASF_B            1195 mV
  1.2 V_ASF_D            1198 mV
  1.5 V                  1501 mV
  1.8 V                  1814 mV
  3.3 V                  3300 mV
  3.3 V bias             3300 mV
  3.3 V ASF              3274 mV
  9.0 V                  8250 mV
SIB F2S 3/2 status:
State                    Online
Temperature              37 degrees C / 98 degrees F
Power
  1.2 V_1                0 mV
  1.2 V_ASF              1202 mV
  1.2 V_ASF_B            1195 mV
  1.2 V_ASF_D            1195 mV
  1.5 V                  1495 mV
  1.8 V                  1804 mV
  3.3 V                  3300 mV
  3.3 V bias             3300 mV
  3.3 V ASF              3286 mV
  9.0 V                  8250 mV
SIB F2S 3/4 status:
State                    Online
Temperature              37 degrees C / 98 degrees F
Power
  1.2 V_1                0 mV
  1.2 V_ASF              1205 mV
  1.2 V_ASF_B            1198 mV

```

```

1.2 V_ASF_D          1202 mV
1.5 V                1501 mV
1.8 V                1811 mV
3.3 V                3300 mV
3.3 V bias           3300 mV
3.3 V ASF            3318 mV
9.0 V                8250 mV
SIB F2S 3/6 status:
State                Online
Temperature          37 degrees C / 98 degrees F
Power
  1.2 V_1             0 mV
  1.2 V_ASF           1205 mV
  1.2 V_ASF_B         1202 mV
  1.2 V_ASF_D         1202 mV
  1.5 V               1511 mV
  1.8 V               1820 mV
  3.3 V               3306 mV
  3.3 V bias          3306 mV
  3.3 V ASF           3318 mV
  9.0 V               8265 mV
SIB F2S 4/0 status:
State                Online
Temperature          36 degrees C / 96 degrees F
Power
  1.2 V_1             0 mV
  1.2 V_ASF           1198 mV
  1.2 V_ASF_B         1198 mV
  1.2 V_ASF_D         1198 mV
  1.5 V               1501 mV
  1.8 V               1814 mV
  3.3 V               3292 mV
  3.3 V bias          3292 mV
  3.3 V ASF           3312 mV
  9.0 V               8230 mV
SIB F2S 4/2 status:
State                Online
Temperature          37 degrees C / 98 degrees F
Power
  1.2 V_1             0 mV
  1.2 V_ASF           1198 mV
  1.2 V_ASF_B         1192 mV
  1.2 V_ASF_D         1195 mV
  1.5 V               1495 mV
  1.8 V               1807 mV
  3.3 V               3300 mV
  3.3 V bias          3300 mV
  3.3 V ASF           3300 mV
  9.0 V               8250 mV
SIB F2S 4/4 status:
State                Online
Temperature          36 degrees C / 96 degrees F
Power
  1.2 V_1             0 mV
  1.2 V_ASF           1202 mV
  1.2 V_ASF_B         1195 mV
  1.2 V_ASF_D         1202 mV
  1.5 V               1501 mV
  1.8 V               1814 mV
  3.3 V               3300 mV

```

```

    3.3 V bias          3300 mV
    3.3 V ASF           3312 mV
    9.0 V               8250 mV
SIB F2S 4/6 status:
State                  Online
Temperature            36 degrees C / 96 degrees F
Power
  1.2 V_1              0 mV
  1.2 V_ASF            1198 mV
  1.2 V_ASF_B          1195 mV
  1.2 V_ASF_D          1198 mV
  1.5 V                1498 mV
  1.8 V                1820 mV
  3.3 V                3292 mV
  3.3 V bias           3292 mV
  3.3 V ASF            3286 mV
  9.0 V               8230 mV

1cc0-re0:
-----
SIB 0 status:
State                  Online - Standby
Temperature            49 degrees C / 120 degrees F
Temperature (B)        42 degrees C / 107 degrees F
Power
  1.2 V                1204 mV
  1.5 V                1484 mV
  2.5 V                2500 mV
  3.3 V                3312 mV
  3.3 V bias           3312 mV
  5.0 V bias           4956 mV
  8.0 V bias           7740 mV
  9.0 V               8880 mV
Power (B)
  1.2 V                1206 mV
  2.5 V                2500 mV
  3.3 V                3316 mV
  9.0 V               8988 mV
SIB 1 status:
State                  Online
Temperature            49 degrees C / 120 degrees F
Temperature (B)        42 degrees C / 107 degrees F
Power
  1.2 V                1202 mV
  1.5 V                1482 mV
  2.5 V                2500 mV
  3.3 V                3296 mV
  3.3 V bias           3288 mV
  5.0 V bias           4986 mV
  8.0 V bias           7800 mV
  9.0 V               8868 mV
Power (B)
  1.2 V                1206 mV
  2.5 V                2512 mV
  3.3 V                3312 mV
  9.0 V               8952 mV
SIB 2 status:
State                  Online
Temperature            49 degrees C / 120 degrees F
Temperature (B)        42 degrees C / 107 degrees F

```

```

Power
  1.2 V          1202 mV
  1.5 V          1480 mV
  2.5 V          2476 mV
  3.3 V          3292 mV
  3.3 V bias     3308 mV
  5.0 V bias     5010 mV
  8.0 V bias     7800 mV
  9.0 V          8880 mV
Power (B)
  1.2 V          1204 mV
  2.5 V          2516 mV
  3.3 V          3308 mV
  9.0 V          8988 mV
SIB 3 status:
State           Online
Temperature     48 degrees C / 118 degrees F
Temperature (B) 42 degrees C / 107 degrees F
Power
  1.2 V          1204 mV
  1.5 V          1480 mV
  2.5 V          2500 mV
  3.3 V          3292 mV
  3.3 V bias     3292 mV
  5.0 V bias     4986 mV
  8.0 V bias     7812 mV
  9.0 V          8892 mV
Power (B)
  1.2 V          1198 mV
  2.5 V          2512 mV
  3.3 V          3308 mV
  9.0 V          8892 mV
SIB 4 status:
State           Online
Temperature     48 degrees C / 118 degrees F
Temperature (B) 42 degrees C / 107 degrees F
Power
  1.2 V          1206 mV
  1.5 V          1482 mV
  2.5 V          2484 mV
  3.3 V          3324 mV
  3.3 V bias     3340 mV
  5.0 V bias     4980 mV
  8.0 V bias     7764 mV
  9.0 V          8784 mV
Power (B)
  1.2 V          1202 mV
  2.5 V          2504 mV
  3.3 V          3308 mV
  9.0 V          8820 mV
lcc1-re0:
-----
SIB 0 status:
State           Online - Standby
Temperature     49 degrees C / 120 degrees F
Temperature (B) 43 degrees C / 109 degrees F
Power
  1.2 V          1206 mV
  1.5 V          1506 mV
  2.5 V          2496 mV

```

```

3.3 V          3308 mV
3.3 V bias     3296 mV
5.0 V bias     4974 mV
8.0 V bias     7884 mV
9.0 V          8820 mV
Power (B)
1.2 V          1200 mV
2.5 V          2508 mV
3.3 V          3292 mV
9.0 V          8892 mV
...

```

### show chassis environment sib sfc (TX Matrix Plus Router)

```
user@host> show chassis environment sib sfc
```

```
sfc0-re0:
```

```
-----
SIB F13 0 status:
```

```

State          Online - Standby
Temperature     54 degrees C / 129 degrees F
Temperature (B) 50 degrees C / 122 degrees F
Power
1.2 V_0        1205 mV
1.2 V_1        1205 mV
1.2 V_2        1208 mV
1.2 V_3        1208 mV
1.5 V_0        1501 mV
1.5 V_1        1508 mV
1.8 V          1804 mV
2.5 V          2504 mV
3.3 V          3312 mV
9.0 V          8991 mV
9.0 V bias      0 mV
Power (B)
2.5 V          2516 mV
3.3 V          3318 mV
9.0 V          9048 mV

```

```
SIB F13 1 status:
```

```

State          Online - Standby
Temperature     45 degrees C / 113 degrees F
Temperature (B) 42 degrees C / 107 degrees F
Power
1.2 V_0        1202 mV
1.2 V_1        1205 mV
1.2 V_2        1198 mV
1.2 V_3        1205 mV
1.5 V_0        1498 mV
1.5 V_1        1495 mV
1.8 V          1801 mV
2.5 V          2507 mV
3.3 V          3306 mV
9.0 V          8970 mV
9.0 V bias      0 mV
Power (B)
2.5 V          2507 mV
3.3 V          3306 mV
9.0 V          8970 mV

```

```
SIB F13 3 status:
```

```
State          Online
```



```

Temperature          48 degrees C / 118 degrees F
Temperature (B)      43 degrees C / 109 degrees F
Power
  1.2 V_0            1208 mV
  1.2 V_1            1195 mV
  1.2 V_2            1202 mV
  1.2 V_3            1198 mV
  1.5 V_0            1504 mV
  1.5 V_1            1504 mV
  1.8 V              1801 mV
  2.5 V              2510 mV
  3.3 V              3312 mV
  9.0 V              8970 mV
  9.0 V bias         0 mV
Power (B)
  2.5 V              2500 mV
  3.3 V              3332 mV
  9.0 V              8970 mV
SIB F13 4 status:
State                Online
Temperature           44 degrees C / 111 degrees F
Temperature (B)       40 degrees C / 104 degrees F
Power
  1.2 V_0            1205 mV
  1.2 V_1            1202 mV
  1.2 V_2            1205 mV
  1.2 V_3            1202 mV
  1.5 V_0            1508 mV
  1.5 V_1            1511 mV
  1.8 V              1811 mV
  2.5 V              2510 mV
  3.3 V              3312 mV
  9.0 V              8952 mV
  9.0 V bias         0 mV
Power (B)
  2.5 V              2510 mV
  3.3 V              3306 mV
  9.0 V              9024 mV
SIB F13 6 status:
State                Online
Temperature           49 degrees C / 120 degrees F
Temperature (B)       46 degrees C / 114 degrees F
Power
  1.2 V_0            1195 mV
  1.2 V_1            1198 mV
  1.2 V_2            1202 mV
  1.2 V_3            1202 mV
  1.5 V_0            1501 mV
  1.5 V_1            1495 mV
  1.8 V              1801 mV
  2.5 V              2507 mV
  3.3 V              3306 mV
  9.0 V              8979 mV
  9.0 V bias         0 mV
Power (B)
  2.5 V              2497 mV
  3.3 V              3318 mV
  9.0 V              9006 mV
SIB F13 7 status:
State                Online

```

```

Temperature                    52 degrees C / 125 degrees F
Temperature (B)                48 degrees C / 118 degrees F
Power
  1.2 V_0                      1198 mV
  1.2 V_1                      1198 mV
  1.2 V_2                      1202 mV
  1.2 V_3                      1189 mV
  1.5 V_0                      1498 mV
  1.5 V_1                      1498 mV
  1.8 V                        1804 mV
  2.5 V                        2491 mV
  3.3 V                        3292 mV
  9.0 V                        8904 mV
  9.0 V bias                    0 mV
Power (B)
  2.5 V                        2500 mV
  3.3 V                        3306 mV
  9.0 V                        8952 mV
SIB F13 8 status:
State                          Online
Temperature                    54 degrees C / 129 degrees F
Temperature (B)                49 degrees C / 120 degrees F
Power
  1.2 V_0                      1211 mV
  1.2 V_1                      1208 mV
  1.2 V_2                      1208 mV
  1.2 V_3                      1211 mV
  1.5 V_0                      1508 mV
  1.5 V_1                      1511 mV
  1.8 V                        1801 mV
  2.5 V                        2513 mV
  3.3 V                        3324 mV
  9.0 V                        9048 mV
  9.0 V bias                    0 mV
Power (B)
  2.5 V                        2516 mV
  3.3 V                        3318 mV
  9.0 V                        9102 mV
SIB F13 9 status:
State                          Online
Temperature                    46 degrees C / 114 degrees F
Temperature (B)                41 degrees C / 105 degrees F
Power
  1.2 V_0                      1205 mV
  1.2 V_1                      1202 mV
  1.2 V_2                      1205 mV
  1.2 V_3                      1198 mV
  1.5 V_0                      1504 mV
  1.5 V_1                      1504 mV
  1.8 V                        1817 mV
  2.5 V                        2507 mV
  3.3 V                        3306 mV
  9.0 V                        8991 mV
  9.0 V bias                    0 mV
Power (B)
  2.5 V                        2510 mV
  3.3 V                        3332 mV
  9.0 V                        9006 mV
SIB F13 11 status:
State                          Online

```

```

Temperature          47 degrees C / 116 degrees F
Temperature (B)      42 degrees C / 107 degrees F
Power
  1.2 V_0            1202 mV
  1.2 V_1            1205 mV
  1.2 V_2            1202 mV
  1.2 V_3            1198 mV
  1.5 V_0            1501 mV
  1.5 V_1            1504 mV
  1.8 V              1807 mV
  2.5 V              2510 mV
  3.3 V              3306 mV
  9.0 V              8991 mV
  9.0 V bias         0 mV
Power (B)
  2.5 V              2249 mV
  3.3 V              4994 mV
  9.0 V              9936 mV
SIB F13 12 status:
State                Online
Temperature           44 degrees C / 111 degrees F
Temperature (B)       40 degrees C / 104 degrees F
Power
  1.2 V_0            1208 mV
  1.2 V_1            1202 mV
  1.2 V_2            1208 mV
  1.2 V_3            1205 mV
  1.5 V_0            1511 mV
  1.5 V_1            1508 mV
  1.8 V              1814 mV
  2.5 V              2507 mV
  3.3 V              3318 mV
  9.0 V              9039 mV
  9.0 V bias         0 mV
Power (B)
  2.5 V              2516 mV
  3.3 V              3344 mV
  9.0 V              9006 mV
SIB F2S 0/0 status:
State                Online - Standby
Temperature           40 degrees C / 104 degrees F
Power
  1.2 V_1            0 mV
  1.2 V_ASF          1198 mV
  1.2 V_ASF_B        1198 mV
  1.2 V_ASF_D        1202 mV
  1.5 V              1498 mV
  1.8 V              1814 mV
  3.3 V              3300 mV
  3.3 V bias         3300 mV
  3.3 V ASF          3286 mV
  9.0 V              8250 mV
SIB F2S 0/2 status:
State                Online - Standby
Temperature           40 degrees C / 104 degrees F
Power
  1.2 V_1            0 mV
  1.2 V_ASF          1198 mV
  1.2 V_ASF_B        1195 mV
  1.2 V_ASF_D        1202 mV

```

1.5 V	1498 mV
1.8 V	1807 mV
3.3 V	3300 mV
3.3 V bias	3300 mV
3.3 V ASF	3292 mV
9.0 V	8250 mV
SIB F2S 0/4 status:	
State	Online - Standby
Temperature	40 degrees C / 104 degrees F
Power	
1.2 V_1	0 mV
1.2 V_ASF	1198 mV
1.2 V_ASF_B	1195 mV
1.2 V_ASF_D	1202 mV
1.5 V	1501 mV
1.8 V	1817 mV
3.3 V	3300 mV
3.3 V bias	3300 mV
3.3 V ASF	3306 mV
9.0 V	8250 mV
SIB F2S 0/6 status:	
State	Online - Standby
Temperature	39 degrees C / 102 degrees F
Power	
1.2 V_1	0 mV
1.2 V_ASF	1202 mV
1.2 V_ASF_B	1198 mV
1.2 V_ASF_D	1198 mV
1.5 V	1495 mV
1.8 V	1814 mV
3.3 V	3300 mV
3.3 V bias	3300 mV
3.3 V ASF	3280 mV
9.0 V	8250 mV
SIB F2S 1/0 status:	
State	Online
Temperature	39 degrees C / 102 degrees F
Power	
1.2 V_1	0 mV
1.2 V_ASF	1195 mV
1.2 V_ASF_B	1192 mV
1.2 V_ASF_D	1195 mV
1.5 V	1492 mV
1.8 V	1798 mV
3.3 V	3300 mV
3.3 V bias	3300 mV
3.3 V ASF	3280 mV
9.0 V	8250 mV
SIB F2S 1/2 status:	
State	Online
Temperature	39 degrees C / 102 degrees F
Power	
1.2 V_1	0 mV
1.2 V_ASF	1205 mV
1.2 V_ASF_B	1202 mV
1.2 V_ASF_D	1205 mV
1.5 V	1504 mV
1.8 V	1820 mV
3.3 V	3300 mV
3.3 V bias	3300 mV

```

    3.3 V ASF          3306 mV
    9.0 V              8250 mV
SIB F2S 1/4 status:
  State               Online
  Temperature         39 degrees C / 102 degrees F
  Power
    1.2 V_1           0 mV
    1.2 V_ASF         1202 mV
    1.2 V_ASF_B       1195 mV
    1.2 V_ASF_D       1198 mV
    1.5 V              1498 mV
    1.8 V              1811 mV
    3.3 V              3300 mV
    3.3 V bias         3300 mV
    3.3 V ASF         3300 mV
    9.0 V              8250 mV
SIB F2S 1/6 status:
  State               Online
  Temperature         39 degrees C / 102 degrees F
  Power
    1.2 V_1           0 mV
    1.2 V_ASF         1195 mV
    1.2 V_ASF_B       1192 mV
    1.2 V_ASF_D       1198 mV
    1.5 V              1498 mV
    1.8 V              1807 mV
    3.3 V              3306 mV
    3.3 V bias         3300 mV
    3.3 V ASF         3292 mV
    9.0 V              8250 mV
SIB F2S 2/0 status:
  State               Online
  Temperature         38 degrees C / 100 degrees F
  Power
    1.2 V_1           0 mV
    1.2 V_ASF         1195 mV
    1.2 V_ASF_B       1195 mV
    1.2 V_ASF_D       1198 mV
    1.5 V              1498 mV
    1.8 V              1804 mV
    3.3 V              3300 mV
    3.3 V bias         3300 mV
    3.3 V ASF         3292 mV
    9.0 V              8250 mV
...

```

### show chassis environment sib f13 (TX Matrix Plus Router)

```
user@host> show chassis environment sib f13 0
```

```

SIB F13 0 status:
  State               Online - Standby
  Temperature         54 degrees C / 129 degrees F
  Temperature (B)     50 degrees C / 122 degrees F
  Power
    1.2 V_0           1202 mV
    1.2 V_1           1202 mV
    1.2 V_2           1208 mV
    1.2 V_3           1208 mV
    1.5 V_0           1501 mV

```

1.5 V_1	1504 mV
1.8 V	1801 mV
2.5 V	2504 mV
3.3 V	3318 mV
9.0 V	8991 mV
9.0 V bias	0 mV
Power (B)	
2.5 V	2510 mV
3.3 V	3318 mV
9.0 V	9024 mV

### show chassis environment sib f2s (TX Matrix Plus Router)

```
user@host> show chassis environment sib f2s 0/2
```

SIB F2S 0/2 status:

State	Online - Standby
Temperature	40 degrees C / 104 degrees F
Power	
1.2 V_1	0 mV
1.2 V_ASF	1198 mV
1.2 V_ASF_B	1195 mV
1.2 V_ASF_D	1202 mV
1.5 V	1501 mV
1.8 V	1807 mV
3.3 V	3300 mV
3.3 V bias	3300 mV
3.3 V ASF	3286 mV
9.0 V	8250 mV

### show chassis environment sib (TX Matrix Plus router with 3D SIBs)

```
user@host> show chassis environment sib
```

sfc0-re0:

SIB F13 0 status:

State	Online
Board Temperature	44 degrees C / 111 degrees F
XF Junction Temperature	62 degrees C / 143 degrees F
Power	
XF F1 LCC0 1.0 V	999 mV
PCIe Switch 1.0 V	1000 mV
XF F3 LCC0 1.0 V	1000 mV
XF F1/F3 LCC0 1.2 V	1199 mV
XF F1 LCC1 1.0 V	1000 mV
XF F1/F3 LCC1 1.2 V	1199 mV
XF F3 LCC1 1.0 V	1000 mV
XF F1/F3 1.5 V	1499 mV
XF RC LCC0 Base 1.0	1000 mV
XF RC Base 1.2 V	1200 mV
XF RC LCC1 Base 1.0	1000 mV
XF RC Base 1.5 V	1499 mV
3.3 V Base	3300 mV
VSC8248 Base 1.8V	1796 mV
FPGA Core 0.9 V	899 mV
2.5 V Base	2500 mV
1tc3880-3.3v-bias	3343 mV
CXP Base 4.0 V	3999 mV

```

XF RC LCC0 Mezz 1.0      1000 mV
XF RC Mezz 1.2 V        1199 mV
XF RC LCC1 Mezz 1.0      999 mV
XF RC Mezz 1.5 V        1499 mV
3.3 V Mezz              3299 mV
VSC8248 Mezz 1.8V       1800 mV
CXP Mezz 4.0 V          3999 mV
[...Output Truncated...]
SIB F2S 0/0 status:
State                   Online
Board Temperature      32 degrees C / 89 degrees F
XF Junction Temperature 41 degrees C / 105 degrees F
Power
  XF F2S 1.8 V LD0      1775 mV
  XF F2S 1.0 V AN       992 mV
  XF F2S 1.0 V          1002 mV
  XF F2S 1.5 V          1488 mV
  1.5 V Base            2500 mV
  3.3 V bias            3306 mV
  3.3 V Base            3280 mV
  12.0 V Base           11928 mV
[...Output Truncated...]
SIB F2S 2/6 status:
State                   Online
Board Temperature      28 degrees C / 82 degrees F
XF Junction Temperature 40 degrees C / 104 degrees F
Power
  XF F2S 1.8 V LD0      1782 mV
  XF F2S 1.0 V AN       999 mV
  XF F2S 1.0 V          1005 mV
  XF F2S 1.5 V          1498 mV
  1.5 V Base            2510 mV
  3.3 V bias            3292 mV
  3.3 V Base            3292 mV
  12.0 V Base           12024 mV

1cc0-re0:
-----
SIB 0 status:
State                   Online
Temperature             41 degrees C / 105 degrees F
Temperature (B)         Absent
Max Jn Temperature      48 degrees C / 118 degrees F
Power
  8.0 V bias            8156 mV
  3.3 V bias            3284 mV
  FPGA 0.9 V bias       908 mV
  FPGA 1.1 V bias       1086 mV
  FPGA 1.5 V bias       1487 mV
  FPGA 2.5 V bias       2525 mV
  3.3 V                 3282 mV
  1.5 V                 1487 mV
  XF HSS 1.5 V          1501 mV
  XF1 1.0 V             1001 mV
  XF2 1.0 V             1003 mV
  XF3 1.0 V             998 mV
  XF1 1.8 V LD0         1782 mV
  XF2 1.8 V LD0         1792 mV
  XF3 1.8 V LD0         1782 mV
  CLK BUF 2.5 V LDO     2493 mV

```

```

XF1 1.0 V LDO          991 mV
XF2 1.0 V LDO          991 mV
XF3 1.0 V LDO          991 mV
PCIE SW 3.3 V          3274 mV
PCIE 1.0 V             996 mV
RETIMER 1.2 V          1174 mV
RETIMER IO 1.8 V       1770 mV
                        0 mV
Power (B)
  1.2 V                0 mV
  2.5 V                0 mV
  3.3 V                0 mV
  9.0 V                0 mV

```

[...Output Truncated...]

lcc2-re0:

SIB 0 status:

```

State                  Online
Temperature            42 degrees C / 107 degrees F
Temperature (B)        Absent
Max Jn Temperature     51 degrees C / 123 degrees F
Power
  8.0 V bias           8146 mV
  3.3 V bias           3277 mV
  FPGA 0.9 V bias      903 mV
  FPGA 1.1 V bias      1089 mV
  FPGA 1.5 V bias      1479 mV
  FPGA 2.5 V bias      2515 mV
  3.3 V                3277 mV
  1.5 V                1482 mV
  XF HSS 1.5 V         1501 mV
  XF1 1.0 V            1001 mV
  XF2 1.0 V            1003 mV
  XF3 1.0 V            998 mV
  XF1 1.8 V LDO        1787 mV
  XF2 1.8 V LDO        1792 mV
  XF3 1.8 V LDO        1792 mV
  CLK BUF 2.5 V LDO    2481 mV
  XF1 1.0 V LDO        986 mV
  XF2 1.0 V LDO        993 mV
  XF3 1.0 V LDO        991 mV
  PCIE SW 3.3 V        3279 mV
  PCIE 1.0 V           991 mV
  RETIMER 1.2 V        1179 mV
  RETIMER IO 1.8 V     1772 mV
                        0 mV
Power (B)
  1.2 V                0 mV
  2.5 V                0 mV
  3.3 V                0 mV
  9.0 V                0 mV

```

[...Output Truncated...]

### show chassis environment sib (PTX5000 Packet Transport Router with SIB-I-8S)

```
user@host> show chassis environment sib
```

SIB 0 status:

```

State                  Online
Exhaust Temperature    31 degrees C / 87 degrees F

```



```

Junction Temperature      40 degrees C / 104 degrees F
Power
  1.0 V                   1000 mV
  1.5 V                   1499 mV
  1.2 V                   1200 mV
  3.3 V                   3300 mV
  0.9 V                   900 mV
  2.5 V                   2499 mV
  3.3 V bias              3313 mV
  12.0 V                  12296 mV
  12.0 V i                2908 mA
SIB 1 status:
State                     Online
Exhaust Temperature      31 degrees C / 87 degrees F
Junction Temperature     40 degrees C / 104 degrees F
Power
  1.0 V                   1000 mV
  1.5 V                   1499 mV
  1.2 V                   1200 mV
  3.3 V                   3299 mV
  0.9 V                   900 mV
  2.5 V                   2500 mV
  3.3 V bias              3313 mV
  12.0 V                  12312 mV
  12.0 V i                2979 mA
SIB 2 status:
State                     Online
Exhaust Temperature      31 degrees C / 87 degrees F
Junction Temperature     38 degrees C / 100 degrees F
Power
  1.0 V                   999 mV
  1.5 V                   1499 mV
  1.2 V                   1200 mV
  3.3 V                   3300 mV
  0.9 V                   900 mV
  2.5 V                   2500 mV
  3.3 V bias              3324 mV
  12.0 V                  12312 mV
  12.0 V i                2990 mA
SIB 3 status:
State                     Online
Exhaust Temperature      31 degrees C / 87 degrees F
Junction Temperature     39 degrees C / 102 degrees F
Power
  1.0 V                   999 mV
  1.5 V                   1500 mV
  1.2 V                   1200 mV
  3.3 V                   3300 mV
  0.9 V                   900 mV
  2.5 V                   2499 mV
  3.3 V bias              3307 mV
  12.0 V                  12296 mV
  12.0 V i                3144 mA
SIB 4 status:
State                     Online
Exhaust Temperature      31 degrees C / 87 degrees F
Junction Temperature     38 degrees C / 100 degrees F
Power
  1.0 V                   1000 mV
  1.5 V                   1500 mV

```

1.2 V	1200 mV
3.3 V	3300 mV
0.9 V	899 mV
2.5 V	2499 mV
3.3 V bias	3341 mV
12.0 V	12328 mV
12.0 V i	2836 mA
SIB 5 status:	
State	Online
Exhaust Temperature	31 degrees C / 87 degrees F
Junction Temperature	38 degrees C / 100 degrees F
Power	
1.0 V	1000 mV
1.5 V	1499 mV
1.2 V	1199 mV
3.3 V	3299 mV
0.9 V	900 mV
2.5 V	2499 mV
3.3 V bias	3327 mV
12.0 V	12296 mV
12.0 V i	2919 mA
SIB 6 status:	
State	Online
Exhaust Temperature	31 degrees C / 87 degrees F
Junction Temperature	38 degrees C / 100 degrees F
Power	
1.0 V	1000 mV
1.5 V	1500 mV
1.2 V	1200 mV
3.3 V	3299 mV
0.9 V	899 mV
2.5 V	2500 mV
3.3 V bias	3294 mV
12.0 V	12296 mV
12.0 V i	2825 mA
SIB 7 status:	
State	Online
Exhaust Temperature	30 degrees C / 86 degrees F
Junction Temperature	36 degrees C / 96 degrees F
Power	
1.0 V	1000 mV
1.5 V	1500 mV
1.2 V	1200 mV
3.3 V	3300 mV
0.9 V	899 mV
2.5 V	2499 mV
3.3 V bias	3316 mV
12.0 V	12312 mV
12.0 V i	2844 mA
SIB 8 status:	
State	Online
Exhaust Temperature	31 degrees C / 87 degrees F
Junction Temperature	38 degrees C / 100 degrees F
Power	
1.0 V	1000 mV
1.5 V	1499 mV
1.2 V	1199 mV
3.3 V	3299 mV
0.9 V	900 mV
2.5 V	2500 mV

3.3 V bias	3333 mV
12.0 V	12328 mV
12.0 V i	2900 mA

### show chassis environment sib (PTX5000 Packet Transport Router with SIB-I-8SE)

```
user@host> show chassis environment sib
```

#### SIB 0 status:

State	Online
Exhaust Temperature	29 degrees C / 84 degrees F
Junction Temperature	42 degrees C / 107 degrees F
Power	
1.0 V	999 mV
1.5 V	1500 mV
1.2 V	1200 mV
3.3 V	3300 mV
0.9 V	900 mV
2.5 V	2500 mV
3.3 V bias	3289 mV
12.0 V	12484 mV
2.5 V LDO	2502 mV
12.0 V i	3494 mA

#### SIB 1 status:

State	Online
Exhaust Temperature	28 degrees C / 82 degrees F
Junction Temperature	33 degrees C / 91 degrees F
Power	
1.0 V	1000 mV
1.5 V	1500 mV
1.2 V	1199 mV
3.3 V	3300 mV
0.9 V	899 mV
2.5 V	2500 mV
3.3 V bias	3313 mV
12.0 V	12484 mV
2.5 V LDO	2513 mV
12.0 V i	3099 mA

#### SIB 2 status:

State	Online
Exhaust Temperature	29 degrees C / 84 degrees F
Junction Temperature	39 degrees C / 102 degrees F
Power	
1.0 V	1000 mV
1.5 V	1500 mV
1.2 V	1199 mV
3.3 V	3300 mV
0.9 V	900 mV
2.5 V	2500 mV
3.3 V bias	3307 mV
12.0 V	12484 mV
2.5 V LDO	2512 mV
12.0 V i	3336 mA

#### SIB 3 status:

State	Online
Exhaust Temperature	28 degrees C / 82 degrees F
Junction Temperature	34 degrees C / 93 degrees F
Power	
1.0 V	999 mV
1.5 V	1500 mV

1.2 V	1200 mV
3.3 V	3300 mV
0.9 V	900 mV
2.5 V	2500 mV
3.3 V bias	3299 mV
12.0 V	12500 mV
2.5 V LDO	2494 mV
12.0 V i	3479 mA
SIB 4 status:	
State	Online
Exhaust Temperature	28 degrees C / 82 degrees F
Junction Temperature	38 degrees C / 100 degrees F
Power	
1.0 V	1000 mV
1.5 V	1500 mV
1.2 V	1199 mV
3.3 V	3299 mV
0.9 V	900 mV
2.5 V	2499 mV
3.3 V bias	3309 mV
12.0 V	12484 mV
2.5 V LDO	2499 mV
12.0 V i	3159 mA
SIB 5 status:	
State	Online
Exhaust Temperature	27 degrees C / 80 degrees F
Junction Temperature	33 degrees C / 91 degrees F
Power	
1.0 V	1000 mV
1.5 V	1500 mV
1.2 V	1200 mV
3.3 V	3299 mV
0.9 V	900 mV
2.5 V	2499 mV
3.3 V bias	3308 mV
12.0 V	12468 mV
2.5 V LDO	2495 mV
12.0 V i	3054 mA
SIB 6 status:	
State	Online
Exhaust Temperature	28 degrees C / 82 degrees F
Junction Temperature	38 degrees C / 100 degrees F
Power	
1.0 V	999 mV
1.5 V	1500 mV
1.2 V	1199 mV
3.3 V	3299 mV
0.9 V	899 mV
2.5 V	2499 mV
3.3 V bias	3313 mV
12.0 V	12468 mV
2.5 V LDO	2510 mV
12.0 V i	3122 mA
SIB 7 status:	
State	Online
Exhaust Temperature	26 degrees C / 78 degrees F
Junction Temperature	34 degrees C / 93 degrees F
Power	
1.0 V	999 mV
1.5 V	1499 mV

```

1.2 V          1199 mV
3.3 V          3300 mV
0.9 V          900 mV
2.5 V          2499 mV
3.3 V bias     3278 mV
12.0 V         12468 mV
2.5 V LDO      2504 mV
12.0 V i       3234 mA
SIB 8 status:
State          Online
Exhaust Temperature 26 degrees C / 78 degrees F
Junction Temperature 34 degrees C / 93 degrees F
Power
1.0 V          999 mV
1.5 V          1499 mV
1.2 V          1199 mV
3.3 V          3300 mV
0.9 V          900 mV
2.5 V          2499 mV
3.3 V bias     3278 mV
12.0 V         12468 mV
2.5 V LDO      2504 mV
12.0 V i       3234 mA

```

#### show chassis environment sib (PTX10008 Router)

```
user@host> show chassis environment sib
```

```

SIB 0 status:
State          Online
SIB 0 Intake-A Temp Sensor 37 degrees C / 98 degrees F
SIB 0 Intake-B Temp Sensor 31 degrees C / 87 degrees F
SIB 0 Exhaust-A Temp Sensor34 degrees C / 93 degrees F
SIB 0 Exhaust-B Temp Sensor38 degrees C / 100 degrees F
SIB 0 PF0 Temp Sensor      47 degrees C / 116 degrees F
SIB 0 PF1 Temp Sensor      40 degrees C / 104 degrees F
Power
  PF0 Core 0.9V            925 mV   28929 mA   26835 mW
  PF0 AVDD 1V              1000 mV   32656 mA   32718 mW
  PF1 Core 0.9V            922 mV   28351 mA   26210 mW
  PF1 AVDD 1V              1000 mV   30890 mA   30937 mW
  12V                      12311 mV   10880 mA   134744 mW
SIB 1 status:
State          Online
SIB 1 Intake-A Temp Sensor 43 degrees C / 109 degrees F
SIB 1 Intake-B Temp Sensor 35 degrees C / 95 degrees F
SIB 1 Exhaust-A Temp Sensor37 degrees C / 98 degrees F
SIB 1 Exhaust-B Temp Sensor45 degrees C / 113 degrees F
SIB 1 PF0 Temp Sensor      54 degrees C / 129 degrees F
SIB 1 PF1 Temp Sensor      42 degrees C / 107 degrees F
Power
  PF0 Core 0.9V            951 mV   30468 mA   29007 mW
  PF0 AVDD 1V              999 mV   32921 mA   32921 mW
  PF1 Core 0.9V            924 mV   29046 mA   26828 mW
  PF1 AVDD 1V              1000 mV   30796 mA   30796 mW
  12V                      12298 mV   11356 mA   140682 mW
SIB 2 status:
State          Online
SIB 2 Intake-A Temp Sensor 45 degrees C / 113 degrees F
SIB 2 Intake-B Temp Sensor 36 degrees C / 96 degrees F

```

```

SIB 2 Exhaust-A Temp Sensor38 degrees C / 100 degrees F
SIB 2 Exhaust-B Temp Sensor46 degrees C / 114 degrees F
SIB 2 PF0 Temp Sensor      55 degrees C / 131 degrees F
SIB 2 PF1 Temp Sensor      43 degrees C / 109 degrees F
Power
    PF0 Core 0.9V          924 mV   28273 mA   26140 mW
    PF0 AVDD 1V            1000 mV   32562 mA   32625 mW
    PF1 Core 0.9V          925 mV   29351 mA   27265 mW
    PF1 AVDD 1V            999 mV   31812 mA   31859 mW
    12V                    12351 mV   11010 mA  137481 mW
SIB 3 status:
State                               Online
SIB 3 Intake-A Temp Sensor 44 degrees C / 111 degrees F
SIB 3 Intake-B Temp Sensor 36 degrees C / 96 degrees F
SIB 3 Exhaust-A Temp Sensor37 degrees C / 98 degrees F
SIB 3 Exhaust-B Temp Sensor45 degrees C / 113 degrees F
SIB 3 PF0 Temp Sensor      54 degrees C / 129 degrees F
SIB 3 PF1 Temp Sensor      43 degrees C / 109 degrees F
Power
    PF0 Core 0.9V          924 mV   28820 mA   26695 mW
    PF0 AVDD 1V            999 mV   32265 mA   32281 mW
    PF1 Core 0.9V          923 mV   28933 mA   26757 mW
    PF1 AVDD 1V            999 mV   31281 mA   31265 mW
    12V                    12285 mV   11096 mA  137296 mW
SIB 4 status:
State                               Online
SIB 4 Intake-A Temp Sensor 45 degrees C / 113 degrees F
SIB 4 Intake-B Temp Sensor 36 degrees C / 96 degrees F
SIB 4 Exhaust-A Temp Sensor37 degrees C / 98 degrees F
SIB 4 Exhaust-B Temp Sensor46 degrees C / 114 degrees F
SIB 4 PF0 Temp Sensor      54 degrees C / 129 degrees F
SIB 4 PF1 Temp Sensor      43 degrees C / 109 degrees F
Power
    PF0 Core 0.9V          950 mV   29757 mA   28281 mW
    PF0 AVDD 1V            999 mV   32109 mA   32093 mW
    PF1 Core 0.9V          948 mV   29460 mA   27921 mW
    PF1 AVDD 1V            999 mV   30687 mA   30671 mW
    12V                    12193 mV   11183 mA  137352 mW
SIB 5 status:
State                               Online
SIB 5 Intake-A Temp Sensor 38 degrees C / 100 degrees F
SIB 5 Intake-B Temp Sensor 32 degrees C / 89 degrees F
SIB 5 Exhaust-A Temp Sensor35 degrees C / 95 degrees F
SIB 5 Exhaust-B Temp Sensor39 degrees C / 102 degrees F
SIB 5 PF0 Temp Sensor      45 degrees C / 113 degrees F
SIB 5 PF1 Temp Sensor      43 degrees C / 109 degrees F
Power
    PF0 Core 0.9V          951 mV   29546 mA   28156 mW
    PF0 AVDD 1V            999 mV   31468 mA   31468 mW
    PF1 Core 0.9V          948 mV   30007 mA   28515 mW
    PF1 AVDD 1V            999 mV   31812 mA   31859 mW
    12V                    12179 mV   11399 mA  139720 mW

```

#### show chassis environment sib (PTX10016 Router)

```
user@host> show chassis environment sib
```

```

SIB 0 status:
State                               Online
SIB 0 Intake-A Temp Sensor 22 degrees C / 71 degrees F

```

```

SIB 0 Intake-B Temp Sensor 21 degrees C / 69 degrees F
SIB 0 Intake-C Temp Sensor 17 degrees C / 62 degrees F
SIB 0 Exhaust-A Temp Sensor 29 degrees C / 84 degrees F
SIB 0 Exhaust-B Temp Sensor 30 degrees C / 86 degrees F
SIB 0 Exhaust-C Temp Sensor 25 degrees C / 77 degrees F
SIB 0 PF0 Temp Sensor      31 degrees C / 87 degrees F
SIB 0 PF1 Temp Sensor      31 degrees C / 87 degrees F
SIB 0 PF2 Temp Sensor      32 degrees C / 89 degrees F
SIB 0 PF3 Temp Sensor      33 degrees C / 91 degrees F
SIB 0 PF4 Temp Sensor      29 degrees C / 84 degrees F
SIB 0 PF5 Temp Sensor      27 degrees C / 80 degrees F
Power
  PF0 Core 0.9V            924 mV    24429 mA    22664 mW
  PF0 AVDD 1V              999 mV    19515 mA    19531 mW
  PF1 Core 0.9V            924 mV    24531 mA    22679 mW
  PF1 AVDD 1V              999 mV    17796 mA    17812 mW
  PF2 Core 0.9V            924 mV    24308 mA    22503 mW
  PF2 AVDD 1V              999 mV    16250 mA    16265 mW
  PF3 Core 0.9V            925 mV    24414 mA    22601 mW
  PF3 AVDD 1V              999 mV    15023 mA    15023 mW
  PF4 Core 0.9V            924 mV    24089 mA    22285 mW
  PF4 AVDD 1V              1000 mV    15148 mA    15156 mW
  PF5 Core 0.9V            898 mV    23601 mA    21273 mW
  PF5 AVDD 1V              999 mV    15453 mA    15453 mW
  12V                      12311 mV    11399 mA    141366 mW
  12V_1                    12325 mV    11053 mA    137204 mW

SIB 1 status:
State                               Online
SIB 1 Intake-A Temp Sensor 23 degrees C / 73 degrees F
SIB 1 Intake-B Temp Sensor 23 degrees C / 73 degrees F
SIB 1 Intake-C Temp Sensor 18 degrees C / 64 degrees F
SIB 1 Exhaust-A Temp Sensor 30 degrees C / 86 degrees F
SIB 1 Exhaust-B Temp Sensor 32 degrees C / 89 degrees F
SIB 1 Exhaust-C Temp Sensor 25 degrees C / 77 degrees F
SIB 1 PF0 Temp Sensor      33 degrees C / 91 degrees F
SIB 1 PF1 Temp Sensor      32 degrees C / 89 degrees F
SIB 1 PF2 Temp Sensor      34 degrees C / 93 degrees F
SIB 1 PF3 Temp Sensor      39 degrees C / 102 degrees F
SIB 1 PF4 Temp Sensor      29 degrees C / 84 degrees F
SIB 1 PF5 Temp Sensor      28 degrees C / 82 degrees F
Power
  PF0 Core 0.9V            949 mV    24101 mA    22910 mW
  PF0 AVDD 1V              1000 mV    19046 mA    19062 mW
  PF1 Core 0.9V            924 mV    24375 mA    22546 mW
  PF1 AVDD 1V              999 mV    17843 mA    17859 mW
  PF2 Core 0.9V            923 mV    24183 mA    22355 mW
  PF2 AVDD 1V              999 mV    16109 mA    16117 mW
  PF3 Core 0.9V            949 mV    24246 mA    23097 mW
  PF3 AVDD 1V              1000 mV    14632 mA    14632 mW
  PF4 Core 0.9V            925 mV    23613 mA    21882 mW
  PF4 AVDD 1V              1000 mV    14742 mA    14710 mW
  PF5 Core 0.9V            924 mV    24328 mA    22515 mW
  PF5 AVDD 1V              1000 mV    14640 mA    14664 mW
  12V                      12351 mV    11096 mA    138036 mW
  12V_1                    12219 mV    11226 mA    137500 mW

SIB 2 status:
State                               Online
SIB 2 Intake-A Temp Sensor 25 degrees C / 77 degrees F
SIB 2 Intake-B Temp Sensor 22 degrees C / 71 degrees F
SIB 2 Intake-C Temp Sensor 18 degrees C / 64 degrees F

```

```

SIB 2 Exhaust-A Temp Sensor 29 degrees C / 84 degrees F
SIB 2 Exhaust-B Temp Sensor 33 degrees C / 91 degrees F
SIB 2 Exhaust-C Temp Sensor 24 degrees C / 75 degrees F
SIB 2 PF0 Temp Sensor      33 degrees C / 91 degrees F
SIB 2 PF1 Temp Sensor      31 degrees C / 87 degrees F
SIB 2 PF2 Temp Sensor      34 degrees C / 93 degrees F
SIB 2 PF3 Temp Sensor      42 degrees C / 107 degrees F
SIB 2 PF4 Temp Sensor      28 degrees C / 82 degrees F
SIB 2 PF5 Temp Sensor      27 degrees C / 80 degrees F

```

## Power

PF0 Core 0.9V	899 mV	24046 mA	21656 mW
PF0 AVDD 1V	999 mV	19265 mA	19250 mW
PF1 Core 0.9V	900 mV	24234 mA	21867 mW
PF1 AVDD 1V	999 mV	18000 mA	18015 mW
PF2 Core 0.9V	900 mV	23250 mA	20953 mW
PF2 AVDD 1V	999 mV	16328 mA	16343 mW
PF3 Core 0.9V	899 mV	23976 mA	21570 mW
PF3 AVDD 1V	999 mV	14976 mA	15007 mW
PF4 Core 0.9V	924 mV	23718 mA	21976 mW
PF4 AVDD 1V	1000 mV	14781 mA	14765 mW
PF5 Core 0.9V	899 mV	23265 mA	20937 mW
PF5 AVDD 1V	999 mV	15125 mA	15132 mW
12V	12298 mV	10750 mA	133523 mW
12V_1	12245 mV	10880 mA	134041 mW

## SIB 3 status:

```

State Online
SIB 3 Intake-A Temp Sensor 23 degrees C / 73 degrees F
SIB 3 Intake-B Temp Sensor 25 degrees C / 77 degrees F
SIB 3 Intake-C Temp Sensor 17 degrees C / 62 degrees F
SIB 3 Exhaust-A Temp Sensor 30 degrees C / 86 degrees F
SIB 3 Exhaust-B Temp Sensor 32 degrees C / 89 degrees F
SIB 3 Exhaust-C Temp Sensor 25 degrees C / 77 degrees F
SIB 3 PF0 Temp Sensor      33 degrees C / 91 degrees F
SIB 3 PF1 Temp Sensor      31 degrees C / 87 degrees F
SIB 3 PF2 Temp Sensor      32 degrees C / 89 degrees F
SIB 3 PF3 Temp Sensor      40 degrees C / 104 degrees F
SIB 3 PF4 Temp Sensor      28 degrees C / 82 degrees F
SIB 3 PF5 Temp Sensor      27 degrees C / 80 degrees F

```

## Power

PF0 Core 0.9V	924 mV	24558 mA	22734 mW
PF0 AVDD 1V	999 mV	19500 mA	19515 mW
PF1 Core 0.9V	925 mV	24570 mA	22750 mW
PF1 AVDD 1V	999 mV	17609 mA	17625 mW
PF2 Core 0.9V	899 mV	23144 mA	20832 mW
PF2 AVDD 1V	1000 mV	16375 mA	16390 mW
PF3 Core 0.9V	925 mV	24203 mA	22414 mW
PF3 AVDD 1V	1000 mV	15039 mA	15023 mW
PF4 Core 0.9V	899 mV	23523 mA	21183 mW
PF4 AVDD 1V	999 mV	15273 mA	15296 mW
PF5 Core 0.9V	924 mV	24125 mA	22367 mW
PF5 AVDD 1V	1000 mV	14953 mA	14968 mW
12V	12245 mV	10880 mA	133652 mW
12V_1	12259 mV	11053 mA	136464 mW

## SIB 4 status:

```

State Online
SIB 4 Intake-A Temp Sensor 23 degrees C / 73 degrees F
SIB 4 Intake-B Temp Sensor 26 degrees C / 78 degrees F
SIB 4 Intake-C Temp Sensor 18 degrees C / 64 degrees F
SIB 4 Exhaust-A Temp Sensor 30 degrees C / 86 degrees F
SIB 4 Exhaust-B Temp Sensor 33 degrees C / 91 degrees F

```



```

SIB 4 Exhaust-C Temp Sensor 24 degrees C / 75 degrees F
SIB 4 PF0 Temp Sensor      34 degrees C / 93 degrees F
SIB 4 PF1 Temp Sensor      32 degrees C / 89 degrees F
SIB 4 PF2 Temp Sensor      33 degrees C / 91 degrees F
SIB 4 PF3 Temp Sensor      41 degrees C / 105 degrees F
SIB 4 PF4 Temp Sensor      28 degrees C / 82 degrees F
SIB 4 PF5 Temp Sensor      27 degrees C / 80 degrees F
Power
  PF0 Core 0.9V            925 mV   24644 mA   22824 mW
  PF0 AVDD 1V              999 mV   19375 mA   19390 mW
  PF1 Core 0.9V            900 mV   24109 mA   21703 mW
  PF1 AVDD 1V              999 mV   17687 mA   17695 mW
  PF2 Core 0.9V            899 mV   24085 mA   21710 mW
  PF2 AVDD 1V              999 mV   16578 mA   16570 mW
  PF3 Core 0.9V            949 mV   24652 mA   23410 mW
  PF3 AVDD 1V              1000 mV   14445 mA   14453 mW
  PF4 Core 0.9V            924 mV   23902 mA   22097 mW
  PF4 AVDD 1V              999 mV   14750 mA   14742 mW
  PF5 Core 0.9V            925 mV   24082 mA   22308 mW
  PF5 AVDD 1V              999 mV   14671 mA   14671 mW
  12V                      12338 mV   11139 mA   138277 mW
  12V_1                    12325 mV   11356 mA   140978 mW

SIB 5 status:
State                               Online
SIB 5 Intake-A Temp Sensor 22 degrees C / 71 degrees F
SIB 5 Intake-B Temp Sensor 22 degrees C / 71 degrees F
SIB 5 Intake-C Temp Sensor 18 degrees C / 64 degrees F
SIB 5 Exhaust-A Temp Sensor 28 degrees C / 82 degrees F
SIB 5 Exhaust-B Temp Sensor 28 degrees C / 82 degrees F
SIB 5 Exhaust-C Temp Sensor 25 degrees C / 77 degrees F
SIB 5 PF0 Temp Sensor      32 degrees C / 89 degrees F
SIB 5 PF1 Temp Sensor      31 degrees C / 87 degrees F
SIB 5 PF2 Temp Sensor      32 degrees C / 89 degrees F
SIB 5 PF3 Temp Sensor      33 degrees C / 91 degrees F
SIB 5 PF4 Temp Sensor      29 degrees C / 84 degrees F
SIB 5 PF5 Temp Sensor      28 degrees C / 82 degrees F
Power
  PF0 Core 0.9V            924 mV   25093 mA   23210 mW
  PF0 AVDD 1V              999 mV   19781 mA   19796 mW
  PF1 Core 0.9V            899 mV   24113 mA   21753 mW
  PF1 AVDD 1V              1000 mV   17968 mA   17984 mW
  PF2 Core 0.9V            925 mV   24218 mA   22437 mW
  PF2 AVDD 1V              1000 mV   16539 mA   16531 mW
  PF3 Core 0.9V            898 mV   23511 mA   21164 mW
  PF3 AVDD 1V              999 mV   15015 mA   15023 mW
  PF4 Core 0.9V            975 mV   25328 mA   24718 mW
  PF4 AVDD 1V              1000 mV   14578 mA   14601 mW
  PF5 Core 0.9V            923 mV   24175 mA   22367 mW
  PF5 AVDD 1V              1000 mV   14789 mA   14765 mW
  12V                      12259 mV   11053 mA   136464 mW
  12V_1                    12272 mV   11226 mA   138221 mW

```

## show chassis ethernet-switch

<b>List of Syntax</b>	<a href="#">Syntax on page 1304</a> <a href="#">Syntax (EX8200 Switch) on page 1304</a> <a href="#">Syntax (T4000 Router) on page 1304</a> <a href="#">Syntax (TX Matrix Router) on page 1304</a> <a href="#">Syntax (TX Matrix Plus Router) on page 1304</a> <a href="#">Syntax (MX Series Router) on page 1304</a> <a href="#">Syntax (MX2010, MX2020, and MX2008 Universal Routing Platforms) on page 1304</a> <a href="#">Syntax (MX10008 Universal Routing Platforms) on page 1305</a> <a href="#">Syntax (PTX Series Packet Transport Routers) on page 1305</a>
<b>Syntax</b>	show chassis ethernet-switch <errors <port>>
<b>Syntax (EX8200 Switch)</b>	show chassis ethernet-switch <statistics <port>   switch <number>
<b>Syntax (T4000 Router)</b>	show chassis ethernet-switch <errors <port>   statistics <port>>
<b>Syntax (TX Matrix Router)</b>	show chassis ethernet-switch <errors <port>   statistics <port>> <lcc <number>   scc>
<b>Syntax (TX Matrix Plus Router)</b>	show chassis ethernet-switch <errors <port>   switch <number> <lcc number   sfc number> <statistics <port>   switch <number>
<b>Syntax (MX Series Router)</b>	show chassis ethernet-switch <all-members> <errors <port>> <local> <member member-id>
<b>Syntax (MX2010, MX2020, and MX2008 Universal Routing Platforms)</b>	show chassis ethernet-switch <errors <port>   statistics <port>> <old-rom-packet-count>

Syntax (MX10008 Universal Routing Platforms)	statistics <port>>
Syntax (PTX Series Packet Transport Routers)	show chassis ethernet-switch <errors <port>> <statistics <port>> <port-state <port>>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.4 for EX Series switches.</p> <p><b>sfc</b> option introduced in Junos OS Release 9.6 for the TX Matrix Plus router.</p> <p>Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.2 for PTX10008 Routers.</p> <p>Command introduced in Junos OS Release 18.2 for MX10008 Universal Routing Platforms.</p>
Description	(M10i, M40e, M120, M160, M320, MX Series, and T Series routers and EX8200 and PTX Series routers only) Display information about the ports on the Control Board (CB) Ethernet switch.
Options	<p><b>none</b>—Display information about each connected port on the Ethernet switch. On a TX Matrix router, display information about each connected port on the Ethernet switch on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display information about each connected port on the Ethernet switch on the TX Matrix Plus router and its attached routers.</p> <p><b>all-members</b>—(MX Series routers only) (Optional) Display information about the ports on the CB Ethernet switch on all the members of the Virtual Chassis configuration.</p> <p><b>errors</b>—(Optional) Display the numbers and types of errors accumulated on all ports of the Ethernet switch.</p> <p><b>errors port</b>—(Optional) Display the numbers and types of errors accumulated on the specified port (0 through 15) of the Ethernet switch. On the TX Matrix router, replace <b>port</b> with a value from 0 through 15. On the TX Matrix Plus router and EX8200 switch, replace <b>port</b> with a value from 0 through 27. On the PTX Series Packet Transport Routers, replace <b>port</b> with a value from 0 through 25. On the T4000 routers, MX2020 routers, MX2010 routers, and MX2008 routers, replace <b>port</b> with a value from 0 through 27.</p> <p><b>errors switch number</b>—(TX Matrix Plus router only) (Optional) Display the numbers and types of errors accumulated on the specified switch. Replace <b>number</b> with a value from 0 through 2.</p>

**lcc number**—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers only) (Optional) Display information about the ports on the CB Ethernet switch on the local Virtual Chassis member.

**member member-id**—(MX Series routers only) (Optional) Display information about the ports on the CB Ethernet switch on the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

**old-rom-packet-count**—(MX 2020 Routers only) (Optional) Display information about installed linecards. A non-zero number indicates that the bootrom on that linecard needs to be updated.

**port-state**—(PTX Series only) (Optional) Display information about current port operation (**Blocking**, **Listening**, or **Disabled**).

**scc**—(TX Matrix router only) (Optional) Display information about the ports on the CB's Ethernet switch on the TX Matrix router (switch-card chassis).

**sfc number**—(TX Matrix Plus router only) (Optional) Display information about the ports on the CB's Ethernet switch on the TX Matrix Plus router (or switch-fabric chassis). Replace *number* with 0.

**statistics**—(Optional) Display traffic statistics for each connected port on the Ethernet switch.

**statistics port**—(Optional) Display traffic statistics for the specified port on the Ethernet switch. On the TX Matrix router, replace *port* with a value from 0 through 25. On the TX Matrix Plus router or EX8200 switch, replace *port* with a value from 0 through 27. On the PTX Series Packet Transport Routers, replace *port* with a value from 0 through 25. On the T4000 routers, MX2020 routers, MX2010 routers, and MX2008 routers, replace *port* with a value from 0 through 27.

**statistics switch number**—(TX Matrix Plus routers and EX8200 switch only) (Optional) Display traffic statistics for the specified Ethernet switch number. On the TX Matrix Plus router and EX8216 switch, replace *number* with a value from 0 through 2. On the EX8208 switch, replace *number* with a value from 0 through 1.

**Required Privilege Level** view

**List of Sample Output**

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- [show chassis ethernet-switch \(MX480 Router with MPC4E\) on page 1312](#)
- [show chassis ethernet-switch \(MX2010 Router\) on page 1313](#)
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- [show chassis ethernet-switch \(MX2008 Router\) on page 1333](#)
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- [show chassis ethernet-switch port-state \(PTX5000 Packet Transport Router\) on page 1351](#)

**Output Fields** [Table 117 on page 1307](#) lists the output fields for the **show chassis ethernet-switch** command. Output fields are listed in the approximate order in which they appear.

*Table 117: show chassis ethernet-switch Output Fields*

Field Name	Field Description
Link is good on port n connected to device	Information about the link between each port on the CB's Ethernet switch and one of the following devices:
or	<ul style="list-style-type: none"> <li>FPC0 (Flexible PIC Concentrator 0) through FPC7</li> </ul>
Link is good on Fast Ethernet port n connected to device	<ul style="list-style-type: none"> <li>Local controller</li> <li>Routing Engine</li> <li>Other Routing Engine (on a system with two Routing Engines)</li> <li>SPMB (Switch Processor Mezzanine Board)</li> </ul>
or	<ul style="list-style-type: none"> <li>(TX Matrix router only) LCC0 (line-card chassis 0) through LCC3</li> </ul>
Link is good on Gigabit Ethernet port n connected to device	
or	
Link is down on Gigabit Ethernet port connected to device	

Table 117: show chassis ethernet-switch Output Fields (continued)

Field Name	Field Description
<b>Speed is</b>	Speed at which the Ethernet link is running: <b>10 Mb</b> or <b>100 Mb</b> . When the device is <b>RE</b> or <b>Other RE</b> on the TX Matrix router, the speed is <b>1000 Mb</b> .  <b>NOTE:</b> Irrespective of the device, the speed is <b>1000 Mb</b> on the MX2010, MX2020, and MX2008 routers.
<b>Duplex is</b>	Duplex type of the Ethernet link: <b>full</b> or <b>half</b> .
<b>Autonegotiate is Enabled (or Disabled)</b>	By default, built-in Fast Ethernet ports on a PIC autonegotiate whether to operate at 10 Mbps or 100 Mbps. All other interfaces automatically choose the correct speed based on the PIC type and whether the PIC is configured to operate in multiplexed mode (using the <b>no-concatenate</b> statement at the <b>[edit chassis]</b> hierarchy level, as described in the <i>Junos OS System Basics Configuration Guide</i> ).
<b>Flow Control TX is Enabled (or Disabled)</b>	(MX2010 routers, MX2020 routers, MX2008 routers, and PTX Series) Flow control in the transmit direction is enabled (or disabled). Flow control regulates the flow of packets from the switch to the remote side of the connection.
<b>Flow Control RX is Enabled (or Disabled)</b>	(MX2010 routers, MX2020 routers, MX2008 routers, and PTX Series) Flow control in the receive direction is enabled (or disabled). Flow control regulates the flow of packets from the remote side of the connection to the switch.
<b>MLT3</b>	Number of multilevel threshold-3 (MLT-3) Fast Ethernet errors detected.
<b>Accumulated error counts for port <i>n</i> connected to device FPC<i>n</i>: (error output only)</b>	
<b>Lock</b>	Number of lock errors detected.
<b>Xmit</b>	Number of transmission errors detected.
<b>ESD</b>	Number of electrostatic discharge (ESD) errors detected.
<b>False Carrier</b>	Number of false carrier errors detected. This number is increased by one if a FRU is removed.
<b>Disconnects</b>	Number of disconnect errors detected.
<b>FX mode</b>	Number of errors detected on an Ethernet link over optical fiber.
<b>Statistics for port <i>n</i> connected to device FPC<i>n</i> (statistics output only)</b>	
<b>TX Packets 64 Octets</b>	(MX2010, MX2020, and MX2008 routers) Number of packets of size 64 octets transmitted.
<b>TX Packets 65 - 127 Octets</b>	(MX2010, MX2020, and MX2008 routers) Number of packets of size 65 through 127 octets transmitted.
<b>TX Packets 128 - 255 Octets</b>	(MX2010, MX2020, and MX2008 routers) Number of packets of size 128 through 255 octets transmitted.
<b>TX Packets 256 - 511 Octets</b>	(MX2010, MX2020, and MX2008 routers) Number of packets of size 256 through 511 octets transmitted.

Table 117: show chassis ethernet-switch Output Fields (continued)

Field Name	Field Description
<b>TX Packets 512 - 1023 Octets</b>	(MX2010, MX2020, and MX2008 routers) Number of packets of size 512 through 1023 octets transmitted.
<b>TX Packets 1024 - 1518 Octets</b>	(MX2010, MX2020, and MX2008 routers) Number of packets of size 1024 through 1518 octets transmitted.
<b>TX Packets 1519 - 2047 Octets</b>	(MX2010, MX2020, and MX2008 routers) Number of packets of size 1519 through 2047 octets transmitted.
<b>TX Packets 2048 - 4095 Octets</b>	(MX2010, MX2020, and MX2008 routers) Number of packets of size 2048 through 4095 octets transmitted.
<b>TX Packets 4096 - 9216 Octets</b>	(MX2010, MX2020, and MX2008 routers) Number of packets of size 4096 through 9216 octets transmitted.
<b>TX 1519 - 1522 Good Vlan frms</b>	(MX2010, MX2020, and MX2008 routers) Number of transmitted frames of size 1519 through 1522 octets that are good VLAN frames.
<b>TX Octets</b>	Number of octets sent.
<b>TX Unicast packets</b>	Number of unicast packets sent.
<b>TX Multicast packets</b>	Number of multicast packets sent.
<b>TX Broadcast packets</b>	Number of broadcast packets sent.
<b>TX Single Collision frames</b>	(MX2010, MX2020, and MX2008 routers) Number of packets sent after one collision.
<b>TX Mult. Collision frames</b>	(MX2010, MX2020, and MX2008 routers) Number of packets sent after multiple collisions.
<b>TX Late collisions</b>	Number of packets aborted during sending because of collisions after 64 bytes.
<b>TX Excessive collisions</b>	Number of packets not sent because of too many collisions.
<b>TX Dropped packets</b>	Number of transmitted packets that were dropped.
<b>TX PAUSEMAC Ctrl Frames</b>	Number of Media Access Control (MAC) frames containing PAUSE commands that were sent.
<b>TX Oversize Packets</b>	Number of oversize packets that were sent.
<b>TX FCS Error Counter</b>	Number of packets discarded because of frame check sequence errors.
<b>TX Fragment Counter</b>	Number of fragmented packets sent.
<b>TX Byte Counter</b>	Number of bytes sent.

*Table 117: show chassis ethernet-switch Output Fields (continued)*

Field Name	Field Description
<b>TX Packet OK Counter</b>	Number of viable packets sent.
<b>TX Pause Packet Counter</b>	Number of PAUSE packets sent.
<b>RX Packets 64 Octets</b>	(MX2010, MX2020, and MX2008 routers) Number of packets of size 64 octets received.
<b>RX Packets 65 - 127 Octets</b>	(MX2010, MX2020, and MX2008 routers) Number of packets of size 65 through 127 octets received.
<b>RX Packets 128 - 255 Octets</b>	(MX2010, MX2020, and MX2008 routers) Number of packets of size 128 through 255 octets received.
<b>RX Packets 256 - 511 Octets</b>	(MX2010, MX2020, and MX2008 routers) Number of packets of size 256 through 511 octets received.
<b>RX Packets 512 - 1023 Octets</b>	(MX2010, MX2020, and MX2008 routers) Number of packets of size 512 through 1023 octets received.
<b>RX Packets 1024 - 1518 Octets</b>	(MX2010, MX2020, and MX2008 routers) Number of packets of size 1024 through 1518 octets received.
<b>RX Packets 1519 - 2047 Octets</b>	(MX2010, MX2020, and MX2008 routers) Number of packets of size 1519 through 2047 octets received.
<b>RX Packets 2048 - 4095 Octets</b>	(MX2010, MX2020, and MX2008 routers) Number of packets of size 2048 through 4095 octets received.
<b>RX Packets 4096 - 9216 Octets</b>	(MX2010, MX2020, and MX2008 routers) Number of packets of size 4096 through 9216 octets received.
<b>RX Octets</b>	Number of octets received.
<b>RX Unicast packets</b>	Number of unicast packets received.
<b>RX Multicast packets</b>	Number of multicast packets received.
<b>RX Broadcast packets</b>	Number of broadcast packets received.
<b>RX FCS Errors</b>	Number of packets discarded because of frame check sequence errors.
<b>RX Alignment Errors</b>	Number of incomplete octets received.
<b>RX Dropped Packets</b>	Number of incoming packets that were dropped.
<b>RX Fragments</b>	Number of fragmented packets received.
<b>RX Symbol Errors</b>	Number of symbols received that the router did not correctly decode.



Table 117: *show chassis ethernet-switch Output Fields (continued)*

Field Name	Field Description
<b>RX MAC Control</b>	Number of Media Access Control (MAC) packets received.
<b>RX Oversize Packets</b>	Number of oversize packets received.
<b>RX Undersize Packets</b>	Number of undersize packets received.
<b>RX Jabbers</b>	Total number of frames received that exceed the maximum byte count and contain CRC errors .
<b>RX Control Frame Counter</b>	Number of control frames received.
<b>RX Pause Frame Counter</b>	Number of pause frames received.
<b>RX FCS Errors</b>	Number of packets discarded because of frame check sequence errors.
<b>RX Fragments</b>	Number of fragmented packets received.
<b>RX Byte Counter</b>	Number of bytes received.
<b>RX Packet OK Counter</b>	Number of viable packets received.

## Sample Output

### show chassis ethernet-switch

```

user@host> show chassis ethernet-switch

Link is good on port 0 connected to device: FPC0
  Speed is 100 MB
  Duplex is full

Link is good on port 1 connected to device: FPC1
  Speed is 100 MB
  Duplex is full

Link is good on port 2 connected to device: FPC2
  Speed is 100 MB
  Duplex is full

Link is good on port 3 connected to device: FPC3
  Speed is 100 MBb
  Duplex is full

Link is good on port 7 connected to device: Local controller
  Speed is 100 MB
  Duplex is full

Link is good on port 9 connected to device: SPMB
  Speed is 100 MB
  Duplex is full

```

```
Link is good on port 13 connected to device: FPC5
Speed is 100 MB
Duplex is full
```

#### show chassis ethernet-switch (MX480 Router with MPC4E)

```
user@host > show chassis ethernet-switch

Displaying summary for switch 0
Link is down on GE port 0 connected to device: FPC0

Link is down on GE port 1 connected to device: FPC1

Link is good on GE port 2 connected to device: FPC2
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 3 connected to device: FPC3
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 4 connected to device: FPC4
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is down on GE port 5 connected to device: FPC5

Link is down on GE port 6 connected to device: FPC6

Link is down on GE port 7 connected to device: FPC7

Link is down on GE port 8 connected to device: FPC8

Link is down on GE port 9 connected to device: FPC9

Link is down on GE port 10 connected to device: FPC10

Link is down on GE port 11 connected to device: FPC11

Link is good on GE port 12 connected to device: Other RE
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 13 connected to device: RE-GigE
Speed is 1000Mb
Duplex is full
```

```

Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

```

Link is down on GE port 14 connected to device: Debug-GigE

### show chassis ethernet-switch (MX2010 Router)

```
user@host > show chassis ethernet-switch
```

Displaying summary for switch 0

Link is good on GE port 0 connected to device: FPC0

```

Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

```

Link is good on GE port 1 connected to device: FPC1

```

Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

```

Link is good on GE port 2 connected to device: FPC3

```

Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

```

Link is good on GE port 3 connected to device: FPC2

```

Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

```

Link is good on GE port 4 connected to device: FPC5

```

Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

```

Link is good on GE port 5 connected to device: FPC4

```

Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

```

Link is good on GE port 6 connected to device: FPC6

```

Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

```

```

Link is good on GE port 7 connected to device: FPC7
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 8 connected to device: FPC8
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 9 connected to device: FPC9
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 20 connected to device: Other RE-GigE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 21 connected to device: RE-GigE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is down on GE port 22 connected to device: Debug-GigE

Link is good on GE port 23 connected to device: SPMB
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is down on XE port 24 connected to device: SFP+ 0

Link is down on XE port 25 connected to device: SFP+ 1

Link is down on XE port 26 connected to device: RE-10GigE

Link is down on XE port 27 connected to device: Other RE-10GigE

```

### show chassis ethernet-switch statistics (MX2010 Router)

```

user@host > show chassis ethernet-switch statistics

Displaying port statistics for switch 0
Statistics for port 0 connected to device FPC0:
  TX Packets 64 Octets          5088623
  TX Packets 65-127 Octets     2637257

```

```

TX Packets 128-255 Octets      84829
TX Packets 256-511 Octets     120193
TX Packets 512-1023 Octets    252371
TX Packets 1024-1518 Octets   7189736
TX Packets 1519-2047 Octets    0
TX Packets 2048-4095 Octets    0
TX Packets 4096-9216 Octets    0
TX 1519-1522 Good Vlan frms   0
TX Octets                     15373009
TX Multicast Packets          14
TX Broadcast Packets          1679654
TX Single Collision frames    0
TX Mult. Collision frames     0
TX Late Collisions            0
TX Excessive Collisions       0
TX Collision frames           0
TX PAUSEMAC Ctrl Frames       0
TX MAC ctrl frames            0
TX Frame deferred Xtns        0
TX Frame excessive deferl     0
TX Oversize Packets           0
TX Jabbers                    0
TX FCS Error Counter          0
TX Fragment Counter           0
TX Byte Counter               3041239292
RX Packets 64 Octets          874260
RX Packets 65-127 Octets      26066124
RX Packets 128-255 Octets     1386532
RX Packets 256-511 Octets     150539
RX Packets 512-1023 Octets    4636799
RX Packets 1024-1518 Octets   92601
RX Packets 1519-2047 Octets    0
RX Packets 2048-4095 Octets    0
RX Packets 4096-9216 Octets    0
RX Octets                     33206855
RX Multicast Packets          0
RX Broadcast Packets          279416
RX FCS Errors                 0
RX Align Errors               0
RX Fragments                  0
RX Symbol errors              0
RX Unsupported opcodes        0
RX Out of Range Length        0
RX False Carrier Errors       0
RX Undersize Packets          0
RX Oversize Packets           0
RX Jabbers                    0
RX 1519-1522 Good Vlan frms   0
RX MTU Exceed Counter         0
RX Control Frame Counter       0
RX Pause Frame Counter         0
RX Byte Counter               958929187
Statistics for port 1 connected to device FPC1:
TX Packets 64 Octets          5109146
TX Packets 65-127 Octets      2779473
TX Packets 128-255 Octets     2441286
TX Packets 256-511 Octets     173102
TX Packets 512-1023 Octets    1547504
TX Packets 1024-1518 Octets   7190581
TX Packets 1519-2047 Octets    0

```

```

TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX 1519-1522 Good Vlan frms 0
TX Octets 19241092
TX Multicast Packets 14
TX Broadcast Packets 1673369
TX Single Collision frames 0
TX Mult. Collision frames 0
TX Late Collisions 0
TX Excessive Collisions 0
TX Collision frames 0
TX PAUSEMAC Ctrl Frames 0
TX MAC ctrl frames 0
TX Frame deferred Xmsns 0
TX Frame excessive deferl 0
TX Oversize Packets 0
TX Jabbers 0
TX FCS Error Counter 0
TX Fragment Counter 0
TX Byte Counter 4213380187
RX Packets 64 Octets 865914
RX Packets 65-127 Octets 26612151
RX Packets 128-255 Octets 1090153
RX Packets 256-511 Octets 25126
RX Packets 512-1023 Octets 101158
RX Packets 1024-1518 Octets 78092
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Octets 28772594
RX Multicast Packets 0
RX Broadcast Packets 285669
RX FCS Errors 0
RX Align Errors 0
RX Fragments 0
RX Symbol errors 0
RX Unsupported opcodes 0
RX Out of Range Length 0
RX False Carrier Errors 0
RX Undersize Packets 0
RX Oversize Packets 0
RX Jabbers 0
RX 1519-1522 Good Vlan frms 0
RX MTU Exceed Counter 0
RX Control Frame Counter 0
RX Pause Frame Counter 0
RX Byte Counter 2327283837

```

Link is down on GE port 2 connected to device: FPC3

Link is down on GE port 3 connected to device: FPC2

Link is down on GE port 4 connected to device: FPC5

Link is down on GE port 5 connected to device: FPC4

Link is down on GE port 6 connected to device: FPC6

Link is down on GE port 7 connected to device: FPC7

## Statistics for port 8 connected to device FPC8:

TX Packets 64 Octets	5341094
TX Packets 65-127 Octets	2625310
TX Packets 128-255 Octets	3315158
TX Packets 256-511 Octets	174805
TX Packets 512-1023 Octets	976908
TX Packets 1024-1518 Octets	7181498
TX Packets 1519-2047 Octets	0
TX Packets 2048-4095 Octets	0
TX Packets 4096-9216 Octets	0
TX 1519-1522 Good Vlan frms	0
TX Octets	19614773
TX Multicast Packets	14
TX Broadcast Packets	1673831
TX Single Collision frames	0
TX Mult. Collision frames	0
TX Late Collisions	0
TX Excessive Collisions	0
TX Collision frames	0
TX PAUSEMAC Ctrl Frames	0
TX MAC ctrl frames	0
TX Frame deferred Xms	0
TX Frame excessive deferl	0
TX Oversize Packets	0
TX Jabbers	0
TX FCS Error Counter	0
TX Fragment Counter	0
TX Byte Counter	3946762991
RX Packets 64 Octets	955509
RX Packets 65-127 Octets	27568588
RX Packets 128-255 Octets	1460936
RX Packets 256-511 Octets	153248
RX Packets 512-1023 Octets	2856206
RX Packets 1024-1518 Octets	76419
RX Packets 1519-2047 Octets	0
RX Packets 2048-4095 Octets	0
RX Packets 4096-9216 Octets	0
RX Octets	33070906
RX Multicast Packets	0
RX Broadcast Packets	285183
RX FCS Errors	0
RX Align Errors	0
RX Fragments	0
RX Symbol errors	0
RX Unsupported opcodes	0
RX Out of Range Length	0
RX False Carrier Errors	0
RX Undersize Packets	0
RX Oversize Packets	0
RX Jabbers	0
RX 1519-1522 Good Vlan frms	0
RX MTU Exceed Counter	0
RX Control Frame Counter	0
RX Pause Frame Counter	0
RX Byte Counter	4256093824

## Statistics for port 9 connected to device FPC9:

TX Packets 64 Octets	5237213
TX Packets 65-127 Octets	3268775
TX Packets 128-255 Octets	2320476

```

TX Packets 256-511 Octets 1789844
TX Packets 512-1023 Octets 501022
TX Packets 1024-1518 Octets 7800455
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX 1519-1522 Good Vlan frms 0
TX Octets 20917785
TX Multicast Packets 14
TX Broadcast Packets 1673368
TX Single Collision frames 0
TX Mult. Collision frames 0
TX Late Collisions 0
TX Excessive Collisions 0
TX Collision frames 0
TX PAUSEMAC Ctrl Frames 0
TX MAC ctrl frames 0
TX Frame deferred Xmsns 0
TX Frame excessive deferl 0
TX Oversize Packets 0
TX Jabbers 0
TX FCS Error Counter 0
TX Fragment Counter 0
TX Byte Counter 747012161
RX Packets 64 Octets 1036527
RX Packets 65-127 Octets 27590367
RX Packets 128-255 Octets 1590059
RX Packets 256-511 Octets 328257
RX Packets 512-1023 Octets 75975
RX Packets 1024-1518 Octets 73556
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Octets 30694741
RX Multicast Packets 0
RX Broadcast Packets 285586
RX FCS Errors 0
RX Align Errors 0
RX Fragments 0
RX Symbol errors 0
RX Unsupported opcodes 0
RX Out of Range Length 0
RX False Carrier Errors 0
RX Undersize Packets 0
RX Oversize Packets 0
RX Jabbers 0
RX 1519-1522 Good Vlan frms 0
RX MTU Exceed Counter 0
RX Control Frame Counter 0
RX Pause Frame Counter 0
RX Byte Counter 2727836941

```

Statistics for port 20 connected to device Other RE-GigE:

```

TX Packets 64 Octets 1682540
TX Packets 65-127 Octets 3454
TX Packets 128-255 Octets 659
TX Packets 256-511 Octets 0
TX Packets 512-1023 Octets 1
TX Packets 1024-1518 Octets 0
TX Packets 1519-2047 Octets 0

```



```

TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX 1519-1522 Good Vlan frms 0
TX Octets 1686654
TX Multicast Packets 6
TX Broadcast Packets 1673798
TX Single Collision frames 0
TX Mult. Collision frames 0
TX Late Collisions 0
TX Excessive Collisions 0
TX Collision frames 0
TX PAUSEMAC Ctrl Frames 0
TX MAC ctrl frames 0
TX Frame deferred Xmsns 0
TX Frame excessive deferl 0
TX Oversize Packets 0
TX Jabbers 0
TX FCS Error Counter 0
TX Fragment Counter 0
TX Byte Counter 108042476
RX Packets 64 Octets 710214
RX Packets 65-127 Octets 35785510
RX Packets 128-255 Octets 4616
RX Packets 256-511 Octets 232
RX Packets 512-1023 Octets 565
RX Packets 1024-1518 Octets 28798
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Octets 36529935
RX Multicast Packets 8
RX Broadcast Packets 285546
RX FCS Errors 0
RX Align Errors 0
RX Fragments 0
RX Symbol errors 0
RX Unsupported opcodes 0
RX Out of Range Length 0
RX False Carrier Errors 0
RX Undersize Packets 0
RX Oversize Packets 0
RX Jabbers 0
RX 1519-1522 Good Vlan frms 0
RX MTU Exceed Counter 0
RX Control Frame Counter 0
RX Pause Frame Counter 0
RX Byte Counter 2676440958

```

Statistics for port 21 connected to device RE-GigE:

```

TX Packets 64 Octets 4805310
TX Packets 65-127 Octets 143798628
TX Packets 128-255 Octets 5532385
TX Packets 256-511 Octets 671059
TX Packets 512-1023 Octets 7684123
TX Packets 1024-1518 Octets 344021
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX 1519-1522 Good Vlan frms 0
TX Octets 162835526

```

```

TX Multicast Packets      8
TX Broadcast Packets     1673409
TX Single Collision frames 0
TX Mult. Collision frames 0
TX Late Collisions        0
TX Excessive Collisions   0
TX Collision frames       0
TX PAUSEMAC Ctrl Frames   0
TX MAC ctrl frames        0
TX Frame deferred Xmsns   0
TX Frame excessive deferl 0
TX Oversize Packets       0
TX Jabbers                0
TX FCS Error Counter      0
TX Fragment Counter       0
TX Byte Counter           105857355
RX Packets 64 Octets      14537137
RX Packets 65-127 Octets  11445505
RX Packets 128-255 Octets 8161767
RX Packets 256-511 Octets 2257944
RX Packets 512-1023 Octets 3277807
RX Packets 1024-1518 Octets 29373209
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Octets                 69053369
RX Multicast Packets      6
RX Broadcast Packets      285935
RX FCS Errors             0
RX Align Errors           0
RX Fragments              0
RX Symbol errors          0
RX Unsupported opcodes    0
RX Out of Range Length    0
RX False Carrier Errors   0
RX Undersize Packets      0
RX Oversize Packets       0
RX Jabbers                0
RX 1519-1522 Good Vlan frms 0
RX MTU Exceed Counter     0
RX Control Frame Counter  0
RX Pause Frame Counter    0
RX Byte Counter           2980410755

```

Link is down on GE port 22 connected to device: Debug-GigE  
 Statistics for port 23 connected to device SPMB:

```

TX Packets 64 Octets      1885878
TX Packets 65-127 Octets  138845
TX Packets 128-255 Octets 18
TX Packets 256-511 Octets 1
TX Packets 512-1023 Octets 2
TX Packets 1024-1518 Octets 16391
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX 1519-1522 Good Vlan frms 0
TX Octets                 2041135
TX Multicast Packets      14
TX Broadcast Packets      1707267
TX Single Collision frames 0

```

```

TX Mult. Collision frames 0
TX Late Collisions 0
TX Excessive Collisions 0
TX Collision frames 0
TX PAUSEMAC Ctrl Frames 0
TX MAC ctrl frames 0
TX Frame deferred Xms 0
TX Frame excessive deferl 0
TX Oversize Packets 0
TX Jabbers 0
TX FCS Error Counter 0
TX Fragment Counter 0
TX Byte Counter 148066476
RX Packets 64 Octets 374994
RX Packets 65-127 Octets 183398
RX Packets 128-255 Octets 749
RX Packets 256-511 Octets 13658
RX Packets 512-1023 Octets 13421
RX Packets 1024-1518 Octets 9
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Octets 586229
RX Multicast Packets 0
RX Broadcast Packets 252034
RX FCS Errors 0
RX Align Errors 0
RX Fragments 0
RX Symbol errors 0
RX Unsupported opcodes 0
RX Out of Range Length 0
RX False Carrier Errors 0
RX Undersize Packets 0
RX Oversize Packets 0
RX Jabbers 0
RX 1519-1522 Good Vlan frms 0
RX MTU Exceed Counter 0
RX Control Frame Counter 0
RX Pause Frame Counter 0
RX Byte Counter 51431942

```

Link is down on XE port 24 connected to device: SFP+ 0

Link is down on XE port 25 connected to device: SFP+ 1

Link is down on XE port 26 connected to device: RE-10GigE

Link is down on XE port 27 connected to device: Other RE-10GigE

### show chassis ethernet-switch (MX2020 Router)

```
user@host > show chassis ethernet-switch
```

Displaying summary for switch 0

Link is good on GE port 0 connected to device: FPC0

Speed is 1000Mb

Duplex is full

Autonegotiate is Enabled

Flow Control TX is Disabled

Flow Control RX is Disabled

Link is good on GE port 1 connected to device: FPC1  
Speed is 1000Mb  
Duplex is full  
Autonegotiate is Enabled  
Flow Control TX is Disabled  
Flow Control RX is Disabled

Link is good on GE port 2 connected to device: FPC3  
Speed is 1000Mb  
Duplex is full  
Autonegotiate is Enabled  
Flow Control TX is Disabled  
Flow Control RX is Disabled

Link is good on GE port 3 connected to device: FPC2  
Speed is 1000Mb  
Duplex is full  
Autonegotiate is Enabled  
Flow Control TX is Disabled  
Flow Control RX is Disabled

Link is good on GE port 4 connected to device: FPC5  
Speed is 1000Mb  
Duplex is full  
Autonegotiate is Enabled  
Flow Control TX is Disabled  
Flow Control RX is Disabled

Link is good on GE port 5 connected to device: FPC4  
Speed is 1000Mb  
Duplex is full  
Autonegotiate is Enabled  
Flow Control TX is Disabled  
Flow Control RX is Disabled

Link is good on GE port 6 connected to device: FPC6  
Speed is 1000Mb  
Duplex is full  
Autonegotiate is Enabled  
Flow Control TX is Disabled  
Flow Control RX is Disabled

Link is good on GE port 7 connected to device: FPC7  
Speed is 1000Mb  
Duplex is full  
Autonegotiate is Enabled  
Flow Control TX is Disabled  
Flow Control RX is Disabled

Link is good on GE port 8 connected to device: FPC8  
Speed is 1000Mb  
Duplex is full  
Autonegotiate is Enabled  
Flow Control TX is Disabled  
Flow Control RX is Disabled

Link is good on GE port 9 connected to device: FPC9  
Speed is 1000Mb  
Duplex is full

```
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 10 connected to device: FPC10
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 11 connected to device: FPC11
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 12 connected to device: FPC13
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 13 connected to device: FPC12
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 14 connected to device: FPC14
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 15 connected to device: FPC15
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 16 connected to device: FPC17
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 17 connected to device: FPC16
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled
```

```

Link is good on GE port 18 connected to device: FPC18
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 19 connected to device: FPC19
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 20 connected to device: Other RE-GigE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 21 connected to device: RE-GigE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is down on GE port 22 connected to device: Debug-GigE

Link is good on GE port 23 connected to device: SPMB
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is down on XE port 24 connected to device: SFP+ 0

Link is down on XE port 25 connected to device: SFP+ 1

Link is down on XE port 26 connected to device: RE-10GigE

Link is down on XE port 27 connected to device: Other RE-10GigE

```

### show chassis ethernet-switch statistics (MX2020 Router)

```

user@host > show chassis ethernet-switch statistics

Displaying port statistics for switch 0
Statistics for port 0 connected to device FPC0:
  TX Packets 64 Octets      1468564
  TX Packets 65-127 Octets  153896
  TX Packets 128-255 Octets 237
  TX Packets 256-511 Octets 286
  TX Packets 512-1023 Octets 599
  TX Packets 1024-1518 Octets 22803
  TX Packets 1519-2047 Octets 0
  TX Packets 2048-4095 Octets 0
  TX Packets 4096-9216 Octets 0

```

```

TX 1519-1522 Good Vlan frms 0
TX Octets 1646385
TX Multicast Packets 6
TX Broadcast Packets 970939
TX Single Collision frames 0
TX Mult. Collision frames 0
TX Late Collisions 0
TX Excessive Collisions 0
TX Collision frames 0
TX PAUSEMAC Ctrl Frames 0
TX MAC ctrl frames 0
TX Frame deferred Xms 0
TX Frame excessive deferl 0
TX Oversize Packets 0
TX Jabbers 0
TX FCS Error Counter 0
TX Fragment Counter 0
TX Byte Counter 130470290
RX Packets 64 Octets 180266
RX Packets 65-127 Octets 519030
RX Packets 128-255 Octets 1390
RX Packets 256-511 Octets 42857
RX Packets 512-1023 Octets 3482
RX Packets 1024-1518 Octets 8147
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Octets 755172
RX Multicast Packets 0
RX Broadcast Packets 42822
RX FCS Errors 0
RX Align Errors 0
RX Fragments 0
RX Symbol errors 0
RX Unsupported opcodes 0
RX Out of Range Length 0
RX False Carrier Errors 0
RX Undersize Packets 0
RX Oversize Packets 0
RX Jabbers 0
RX 1519-1522 Good Vlan frms 0
RX MTU Exceed Counter 0
RX Control Frame Counter 0
RX Pause Frame Counter 0
RX Byte Counter 75374021
Statistics for port 1 connected to device FPC1:
TX Packets 64 Octets 1493739
TX Packets 65-127 Octets 126996
TX Packets 128-255 Octets 241
TX Packets 256-511 Octets 283
TX Packets 512-1023 Octets 604
TX Packets 1024-1518 Octets 33687
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX 1519-1522 Good Vlan frms 0
TX Octets 1655550
TX Multicast Packets 6
TX Broadcast Packets 969032
TX Single Collision frames 0

```

```

TX Mult. Collision frames 0
TX Late Collisions 0
TX Excessive Collisions 0
TX Collision frames 0
TX PAUSEMAC Ctrl Frames 0
TX MAC ctrl frames 0
TX Frame deferred Xms 0
TX Frame excessive deferl 0
TX Oversize Packets 0
TX Jabbers 0
TX FCS Error Counter 0
TX Fragment Counter 0
TX Byte Counter 141832690
RX Packets 64 Octets 155655
RX Packets 65-127 Octets 545561
RX Packets 128-255 Octets 1394
RX Packets 256-511 Octets 42811
RX Packets 512-1023 Octets 3514
RX Packets 1024-1518 Octets 8171
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Octets 757106
RX Multicast Packets 0
RX Broadcast Packets 44509
RX FCS Errors 0
RX Align Errors 0
RX Fragments 0
RX Symbol errors 0
RX Unsupported opcodes 0
RX Out of Range Length 0
RX False Carrier Errors 0
RX Undersize Packets 0
RX Oversize Packets 0
RX Jabbers 0
RX 1519-1522 Good Vlan frms 0
RX MTU Exceed Counter 0
RX Control Frame Counter 0
RX Pause Frame Counter 0
RX Byte Counter 75691392
Statistics for port 2 connected to device FPC3:
TX Packets 64 Octets 1465749
TX Packets 65-127 Octets 152849
TX Packets 128-255 Octets 238
TX Packets 256-511 Octets 289
TX Packets 512-1023 Octets 602
TX Packets 1024-1518 Octets 38903
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX 1519-1522 Good Vlan frms 0
TX Octets 1658630
TX Multicast Packets 6
TX Broadcast Packets 968873
TX Single Collision frames 0
TX Mult. Collision frames 0
TX Late Collisions 0
TX Excessive Collisions 0
TX Collision frames 0
TX PAUSEMAC Ctrl Frames 0

```



```

TX MAC ctrl frames      0
TX Frame deferred Xmsns 0
TX Frame excessive deferl 0
TX Oversize Packets     0
TX Jabbers              0
TX FCS Error Counter     0
TX Fragment Counter      0
TX Byte Counter          147427010
RX Packets 64 Octets     181636
RX Packets 65-127 Octets 517526
RX Packets 128-255 Octets 1405
RX Packets 256-511 Octets 42806
RX Packets 512-1023 Octets 3515
RX Packets 1024-1518 Octets 8168
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Octets                755056
RX Multicast Packets     0
RX Broadcast Packets     44490
RX FCS Errors            0
RX Align Errors          0
RX Fragments             0
RX Symbol errors         0
RX Unsupported opcodes   0
RX Out of Range Length   0
RX False Carrier Errors  0
RX Undersize Packets     0
RX Oversize Packets      0
RX Jabbers               0
RX 1519-1522 Good Vlan frms 0
RX MTU Exceed Counter    0
RX Control Frame Counter 0
RX Pause Frame Counter   0
RX Byte Counter          75381869
Statistics for port 3 connected to device FPC2:
TX Packets 64 Octets     1473828
TX Packets 65-127 Octets 145643
TX Packets 128-255 Octets 253
TX Packets 256-511 Octets 285
TX Packets 512-1023 Octets 612
TX Packets 1024-1518 Octets 26603
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX 1519-1522 Good Vlan frms 0
TX Octets                1647224
TX Multicast Packets     6
TX Broadcast Packets     968925
TX Single Collision frames 0
TX Mult. Collision frames 0
TX Late Collisions       0
TX Excessive Collisions  0
TX Collision frames      0
TX PAUSEMAC Ctrl Frames  0
TX MAC ctrl frames      0
TX Frame deferred Xmsns  0
TX Frame excessive deferl 0
TX Oversize Packets      0
TX Jabbers               0

```

```

TX FCS Error Counter      0
TX Fragment Counter      0
TX Byte Counter          134293832
RX Packets 64 Octets     174230
RX Packets 65-127 Octets 525756
RX Packets 128-255 Octets 1404
RX Packets 256-511 Octets 42815
RX Packets 512-1023 Octets 3530
RX Packets 1024-1518 Octets 8176
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Octets                755911
RX Multicast Packets     0
RX Broadcast Packets     44499
RX FCS Errors            0
RX Align Errors          0
RX Fragments             0
RX Symbol errors         0
RX Unsupported opcodes   0
RX Out of Range Length   0
RX False Carrier Errors  0
RX Undersize Packets     0
RX Oversize Packets      0
RX Jabbers               0
RX 1519-1522 Good Vlan frms 0
RX MTU Exceed Counter    0
RX Control Frame Counter 0
RX Pause Frame Counter   0
RX Byte Counter          75517355
Statistics for port 4 connected to device FPC5:
TX Packets 64 Octets     1466664
TX Packets 65-127 Octets 151155
TX Packets 128-255 Octets 238
TX Packets 256-511 Octets 277
TX Packets 512-1023 Octets 615
TX Packets 1024-1518 Octets 54674
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX 1519-1522 Good Vlan frms 0
TX Octets                1673623
TX Multicast Packets     6
TX Broadcast Packets     968610
TX Single Collision frames 0
TX Mult. Collision frames 0
TX Late Collisions       0
TX Excessive Collisions  0
TX Collision frames      0
TX PAUSEMAC Ctrl Frames  0
TX MAC ctrl frames       0
TX Frame deferred Xmsns  0
TX Frame excessive deferl 0
TX Oversize Packets      0
TX Jabbers               0
TX FCS Error Counter      0
TX Fragment Counter      0
TX Byte Counter          164247790
RX Packets 64 Octets     180006
RX Packets 65-127 Octets 518217

```

```

RX Packets 128-255 Octets 1406
RX Packets 256-511 Octets 42787
RX Packets 512-1023 Octets 3515
RX Packets 1024-1518 Octets 8164
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Octets 754095
RX Multicast Packets 0
RX Broadcast Packets 44457
RX FCS Errors 0
RX Align Errors 0
RX Fragments 0
RX Symbol errors 0
RX Unsupported opcodes 0
RX Out of Range Length 0
RX False Carrier Errors 0
RX Undersize Packets 0
RX Oversize Packets 0
RX Jabbers 0
RX 1519-1522 Good Vlan frms 0
RX MTU Exceed Counter 0
RX Control Frame Counter 0
RX Pause Frame Counter 0
RX Byte Counter 75311970
Statistics for port 5 connected to device FPC4:
TX Packets 64 Octets 1464770
TX Packets 65-127 Octets 154498
TX Packets 128-255 Octets 225
TX Packets 256-511 Octets 280
TX Packets 512-1023 Octets 637
TX Packets 1024-1518 Octets 26355
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX 1519-1522 Good Vlan frms 0
TX Octets 1646765
TX Multicast Packets 6
TX Broadcast Packets 968730
TX Single Collision frames 0
TX Mult. Collision frames 0
TX Late Collisions 0
TX Excessive Collisions 0
TX Collision frames 0
TX PAUSEMAC Ctrl Frames 0
TX MAC ctrl frames 0
TX Frame deferred Xtns 0
TX Frame excessive deferl 0
TX Oversize Packets 0
TX Jabbers 0
TX FCS Error Counter 0
TX Fragment Counter 0
TX Byte Counter 134058606
RX Packets 64 Octets 169269
RX Packets 65-127 Octets 515285
RX Packets 128-255 Octets 1527
RX Packets 256-511 Octets 42804
RX Packets 512-1023 Octets 3521
RX Packets 1024-1518 Octets 9142
RX Packets 1519-2047 Octets 0

```

```

RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Octets 741548
RX Multicast Packets 0
RX Broadcast Packets 44470
RX FCS Errors 0
RX Align Errors 0
RX Fragments 0
RX Symbol errors 0
RX Unsupported opcodes 0
RX Out of Range Length 0
RX False Carrier Errors 0
RX Undersize Packets 0
RX Oversize Packets 0
RX Jabbers 0
RX 1519-1522 Good Vlan frms 0
RX MTU Exceed Counter 0
RX Control Frame Counter 0
RX Pause Frame Counter 0
RX Byte Counter 75498393
Statistics for port 6 connected to device FPC6:
TX Packets 64 Octets 1475260
TX Packets 65-127 Octets 143324
TX Packets 128-255 Octets 260
TX Packets 256-511 Octets 274
TX Packets 512-1023 Octets 603
TX Packets 1024-1518 Octets 40631
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX 1519-1522 Good Vlan frms 0
TX Octets 1660352
TX Multicast Packets 6
TX Broadcast Packets 968466
TX Single Collision frames 0
TX Mult. Collision frames 0
TX Late Collisions 0
TX Excessive Collisions 0
TX Collision frames 0
TX PAUSEMAC Ctrl Frames 0
TX MAC ctrl frames 0
TX Frame deferred Xms 0
TX Frame excessive deferl 0
TX Oversize Packets 0
TX Jabbers 0
TX FCS Error Counter 0
TX Fragment Counter 0
TX Byte Counter 149212764
RX Packets 64 Octets 172275
RX Packets 65-127 Octets 526519
RX Packets 128-255 Octets 1394
RX Packets 256-511 Octets 42777
RX Packets 512-1023 Octets 3514
RX Packets 1024-1518 Octets 8161
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Octets 754640
RX Multicast Packets 0
RX Broadcast Packets 44443

```

```

RX FCS Errors          0
RX Align Errors        0
RX Fragments           0
RX Symbol errors       0
RX Unsupported opcodes 0
RX Out of Range Length 0
RX False Carrier Errors 0
RX Undersize Packets   0
RX Oversize Packets    0
RX Jabbers             0
RX 1519-1522 Good Vlan frms 0
RX MTU Exceed Counter  0
RX Control Frame Counter 0
RX Pause Frame Counter 0
RX Byte Counter        75386517
Statistics for port 7 connected to device FPC7:
TX Packets 64 Octets   1472361
TX Packets 65-127 Octets 145646
TX Packets 128-255 Octets 251
TX Packets 256-511 Octets 250
TX Packets 512-1023 Octets 580
TX Packets 1024-1518 Octets 49530
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX 1519-1522 Good Vlan frms 0
TX Octets              1668618
TX Multicast Packets   6
TX Broadcast Packets   968317
TX Single Collision frames 0
TX Mult. Collision frames 0
TX Late Collisions     0
TX Excessive Collisions 0
TX Collision frames    0
TX PAUSEMAC Ctrl Frames 0
TX MAC ctrl frames     0
TX Frame deferred Xmsns 0
TX Frame excessive deferl 0
TX Oversize Packets    0
TX Jabbers             0
TX FCS Error Counter   0
TX Fragment Counter    0
TX Byte Counter        158689814
RX Packets 64 Octets   174618
RX Packets 65-127 Octets 523421
RX Packets 128-255 Octets 1393
RX Packets 256-511 Octets 42764
RX Packets 512-1023 Octets 3514
RX Packets 1024-1518 Octets 8158
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Octets              753868
RX Multicast Packets   0
RX Broadcast Packets   44429
RX FCS Errors          0
RX Align Errors        0
RX Fragments           0
RX Symbol errors       0
RX Unsupported opcodes 0

```

```

RX Out of Range Length      0
RX False Carrier Errors    0
RX Undersize Packets       0
RX Oversize Packets        0
RX Jabbers                 0
RX 1519-1522 Good Vlan frms 0
RX MTU Exceed Counter      0
RX Control Frame Counter    0
RX Pause Frame Counter      0
RX Byte Counter            75309863
Statistics for port 8 connected to device FPC8:
...

```

### show chassis ethernet-switch (MX2020 Router with MPC4E)

```

user@ host > show chassis ethernet-switch

Displaying summary for switch 0
Link is good on GE port 0 connected to device: FPC0
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is down on GE port 1 connected to device: FPC1

Link is down on GE port 2 connected to device: FPC3

Link is down on GE port 3 connected to device: FPC2

Link is down on GE port 4 connected to device: FPC5

Link is down on GE port 5 connected to device: FPC4

Link is down on GE port 6 connected to device: FPC6

Link is down on GE port 7 connected to device: FPC7

Link is down on GE port 8 connected to device: FPC8

Link is good on GE port 9 connected to device: FPC9
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 10 connected to device: FPC10
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is down on GE port 11 connected to device: FPC11

Link is down on GE port 12 connected to device: FPC13

Link is down on GE port 13 connected to device: FPC12

```

```

Link is good on GE port 14 connected to device: FPC14
  Speed is 1000Mb
  Duplex is full
Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is down on GE port 15 connected to device: FPC15

Link is down on GE port 16 connected to device: FPC17

Link is down on GE port 17 connected to device: FPC16

Link is down on GE port 18 connected to device: FPC18

Link is good on GE port 19 connected to device: FPC19
  Speed is 1000Mb
  Duplex is full
Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 20 connected to device: Other RE-GigE
  Speed is 1000Mb
  Duplex is full
Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is good on GE port 21 connected to device: RE-GigE
  Speed is 1000Mb
  Duplex is full
Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is down on GE port 22 connected to device: Debug-GigE

Link is good on GE port 23 connected to device: SPMB
  Speed is 1000Mb
  Duplex is full
Autonegotiate is Enabled
  Flow Control TX is Disabled
  Flow Control RX is Disabled

Link is down on XE port 24 connected to device: SFP+ 0

Link is down on XE port 25 connected to device: SFP+ 1

Link is down on XE port 26 connected to device: RE-10GigE

Link is down on XE port 27 connected to device: Other RE-10GigE

```

### show chassis ethernet-switch (MX2008 Router)

```

user@host> show chassis ethernet-switch

Displaying summary for switch 0
Link is good on GE port 0 connected to device: FPC0

```

```
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is down on GE port 1 connected to device: FPC1

Link is good on GE port 2 connected to device: FPC3
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is down on GE port 3 connected to device: FPC2

Link is good on GE port 4 connected to device: FPC5
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is down on GE port 5 connected to device: FPC4

Link is down on GE port 6 connected to device: FPC6

Link is good on GE port 7 connected to device: FPC7
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is down on GE port 8 connected to device: FPC8

Link is good on GE port 9 connected to device: FPC9
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 20 connected to device: CB-to-CB-GigE 1
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on GE port 21 connected to device: CB-to-CB-GigE 2
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is down on GE port 22 connected to device: (null)
```



```

Link is down on GE port 23 connected to device: (null)

Link is good on XE port 24 connected to device: Other RE-10GigE
Speed is 10000Mb
Duplex is full
Autonegotiate is Disabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on XE port 25 connected to device: RE-10GigE
Speed is 10000Mb
Duplex is full
Autonegotiate is Disabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is down on XE port 26 connected to device: SFP+ 0

Link is down on XE port 27 connected to device: SFP+ 1

```

### show chassis ethernet-switch statistics (Mx10008 Router)

```
user@host> show chassis ethernet-switch statistics
```

```

Switch Status: Online
Link is Disabled on port connected to QPHY_0
Link is Disabled on port connected to QPHY_1
Link is Down on port connected to PTP_FPGA
Link is Disabled on port connected to Unused
Link is Up on port connected to LC0
    Speed      : 10G
    Duplexity   : FD
    Autoneg     : No
    tx_packets  : 2835539
    rx_packets  : 2624197
    tx_errors   : 0
    rx_errors   : 0
Link is Down on port connected to LC1
Link is Up on port connected to LC2
    Speed      : 10G
    Duplexity   : FD
    Autoneg     : No
    tx_packets  : 2889426
    rx_packets  : 2441270
    tx_errors   : 0
    rx_errors   : 0
Link is Up on port connected to LC3
    Speed      : 10G
    Duplexity   : FD
    Autoneg     : No
    tx_packets  : 2776323
    rx_packets  : 2322320
    tx_errors   : 0
    rx_errors   : 0
Link is Disabled on port connected to LC8
Link is Down on port connected to LC4
Link is Disabled on port connected to LC12
Link is Disabled on port connected to LC9
Link is Down on port connected to LC5
Link is Disabled on port connected to LC13

```

```

Link is Disabled on port connected to LC10
Link is Down on port connected to LC6
Link is Disabled on port connected to LC14
Link is Disabled on port connected to LC11
Link is Down on port connected to LC7
Link is Disabled on port connected to LC15
Link is Disabled on port connected to OCB_SW
Link is Disabled on port connected to Unused
Link is Disabled on port connected to Fortville_1
Link is Up on port connected to Fortville_0
    Speed      : 10G
    Duplexity   : FD
    Autoneg     : Yes
    tx_packets  : 7387765
    rx_packets  : 8348292
    tx_errors   : 0
    rx_errors   : 0

```

### show chassis ethernet-switch (TX Matrix Router)

```
user@host> show chassis ethernet-switch
```

```
scc-re0:
```

```

-----
Link is good on FE port 4 connected to device: LCC0
  Speed is 100 MB
  Duplex is full
  Autonegotiate is Enabled

```

```

Link is good on FE port 6 connected to device: LCC2
  Speed is 100 MB
  Duplex is full
  Autonegotiate is Enabled

```

```

Link is good on FE port 8 connected to device: SPMB
  Speed is 100 MB
  Duplex is full
  Autonegotiate is Enabled

```

```
lcc0-re0:
```

```

-----
Link is good on FE port 1 connected to device: FPC1
  Speed is 100 MB
  Duplex is full
  Autonegotiate is Enabled

```

```

Link is good on FE port 2 connected to device: FPC2
  Speed is 100 MB
  Duplex is full
  Autonegotiate is Enabled

```

```

Link is good on FE port 8 connected to device: SPMB
  Speed is 100 MB
  Duplex is full
  Autonegotiate is Enabled

```

```

Link is good on FE port 10 connected to device: SCC
  Speed is 100 MB
  Duplex is full
  Autonegotiate is Enabled

```

```

lcc2-re0:
-----
Link is good on FE port 0 connected to device: FPC0
  Speed is 100 MB
  Duplex is full
  Autonegotiate is Enabled

Link is good on FE port 1 connected to device: FPC1
  Speed is 100 MB
  Duplex is full
  Autonegotiate is Enabled

Link is good on FE port 2 connected to device: FPC2
  Speed is 100 MB
  Duplex is full
  Autonegotiate is Enabled

Link is good on FE port 8 connected to device: SPMB
  Speed is 100 MB
  Duplex is full
  Autonegotiate is Enabled

Link is good on FE port 10 connected to device: SCC
  Speed is 100 MB
  Duplex is full
  Autonegotiate is Enabled

```

### show chassis ethernet-switch errors

```

user@host> show chassis ethernet-switch errors

Accumulated error counts for port 0 connected to device FPC0:
  MLT3          2
  Lock          0
  Xmit          0
  ESD           0
  False carrier 2
  Disconnects   0
  FX mode       0

Accumulated error counts for port 1 connected to device FPC1:
  MLT3          2
  Lock          0
  Xmit          0
  ESD           0
  False carrier 2
  Disconnects   0
  FX mode       0

Accumulated error counts for port 2 connected to device FPC2:
  MLT3          2
  Lock          0
  Xmit          0
  ESD           0
  False carrier 3
  Disconnects   0
  FX mode       0

Accumulated error counts for port 3 connected to device FPC3:
  MLT3          0
  Lock          0
  Xmit          0

```

```

ESD          0
False carrier 0
Disconnects   0
Accumulated error counts for port 4 connected to device Nothing:
MLT3         0
Lock         0
Xmit         0
ESD          0
False carrier 0
Disconnects   0
FX mode      0
...

```

### show chassis ethernet-switch statistics

```

user@host> show chassis ethernet-switch statistics

Statistics for port 0 connected to device FPC0:
TX Unicast packets      68113
TX Multicast packets    0
TX Broadcast packets    20851
TX Late collisions      0
TX Excessive collisions 0
TX Dropped packets      0

RX Unicast packets      67410
RX Multicast packets    0
RX Broadcast packets    20852
RX FCS Errors           0
RX Alignment Errors     0
RX Dropped Packets      0
RX Fragments            0
RX Symbol Errors        0

Statistics for port 1 connected to device FPC1:
TX Unicast packets      66496
TX Multicast packets    0
TX Broadcast packets    20080
TX Late collisions      0
TX Excessive collisions 0
TX Dropped packets      0

RX Unicast packets      66037
RX Multicast packets    0
RX Broadcast packets    20080
RX FCS Errors           0
RX Alignment Errors     0
RX Dropped Packets      0
RX Fragments            0
RX Symbol Errors        0

Statistics for port 2 connected to device FPC2:
TX Unicast packets      64206
TX Multicast packets    0
TX Broadcast packets    21183
TX Late collisions      0
TX Excessive collisions 0
TX Dropped packets      0

RX Unicast packets      63671

```

```

RX Multicast packets      0
RX Broadcast packets     21183
RX FCS Errors             0
RX Alignment Errors       0
RX Dropped Packets        0
RX Fragments              0
RX Symbol Errors          0
Statistics for port 3 connected to device FPC3:
...

```

### show chassis ethernet-switch errors (TX Matrix Plus Router)

```

user@host> show chassis ethernet-switch errors

sfc0-re0:
-----
Displaying error for switch 0

Displaying error for switch 1
Accumulated error counts for port 0 connected to device LCC0:
MLT3          0
Lock          0
Xmit          0
ESD           0
False carrier 0
Disconnects   0
FX mode       0

lcc0-re0:
-----
Displaying error for switch 0
Accumulated error counts for port 6 connected to device FPC0:
MLT3          0
Lock          0
Xmit          0
ESD           0
False carrier 5
Disconnects   0
FX mode       0
Accumulated error counts for port 7 connected to device FPC1:
MLT3          0
Lock          0
Xmit          0
ESD           0
False carrier 7
Disconnects   0
FX mode       0
Accumulated error counts for port 19 connected to device Other RE:
MLT3          0
Lock          0
Xmit          0
ESD           0
False carrier 0
Disconnects   0
FX mode       0
Accumulated error counts for port 20 connected to device SFC0:
MLT3          0
Lock          0
Xmit          0
ESD           0

```

```
False carrier 0
Disconnects   0
FX mode       0
```

### show chassis ethernet-switch sfc errors (TX Matrix Plus Router)

```
user@host> show chassis ethernet-switch errors switch sfc
```

```
sfc0-re0:
```

```
-----
Displaying error for switch 1
```

```
Accumulated error counts for port 0 connected to device LCC0:
```

```
MLT3      0
Lock      0
Xmit      0
ESD       0
False carrier 0
Disconnects 0
FX mode    0
```

```
Accumulated error counts for port 2 connected to device LCC1:
```

```
MLT3      0
Lock      0
Xmit      0
ESD       0
False carrier 0
Disconnects 0
FX mode    0
```

```
Accumulated error counts for port 4 connected to device LCC2:
```

```
MLT3      0
Lock      0
Xmit      0
ESD       0
False carrier 0
Disconnects 0
FX mode    0
```

```
Accumulated error counts for port 6 connected to device LCC3:
```

```
MLT3      0
Lock      0
Xmit      0
ESD       0
False carrier 0
Disconnects 0
FX mode    0
```

```
lcc0-re0:
```

```
-----
error: command is not valid on the t1600
```

```
lcc1-re0:
```

```
-----
error: command is not valid on the t1600
```

```
lcc2-re0:
```

```
-----
error: command is not valid on the t1600
```

```
lcc3-re0:
```

```
-----
error: command is not valid on the t1600
```

## show chassis ethernet-switch statistics (TX Matrix Plus Router)

```
user@host> show chassis ethernet-switch statistics
```

```
sfc0-re0:
```

```
-----
```

Displaying port statistics for switch 0

Statistics for port 1 connected to device 1GSW:

TX Packets 64 Octets	5183577
TX Packets 65-127 Octets	67820
TX Packets 128-255 Octets	772
TX Packets 256-511 Octets	136
TX Packets 512-1023 Octets	68
TX Packets 1024-1518 Octets	10881
TX Packets 1519-2047 Octets	0
TX Packets 2048-4095 Octets	0
TX Packets 4096-9216 Octets	0
TX Packets 9217-16383 Octets	0
TX Octets	5263254
TX Multicast Packets	16
TX Broadcast Packets	723403
TX PAUSEMAC Ctrl Frames	0
TX Oversize Packets	0
TX FCS Error Counter	0
TX Fragment Counter	0
TX Byte Counter	349922253
TX Packet OK Counter	5263254
TX Pause Packet Counter	0
TX Unicast Counter	4539835
RX Packets 64 Octets	6513629
RX Packets 65-127 Octets	88761
RX Packets 128-255 Octets	6382
RX Packets 256-511 Octets	22027
RX Packets 512-1023 Octets	4319
RX Packets 1024-1518 Octets	49922
RX Packets 1519-2047 Octets	0
RX Packets 2048-4095 Octets	0
RX Packets 4096-9216 Octets	0
RX Packets 9217-16383 Octets	0
RX Octets	6685040
RX Multicast Packets	4
RX Broadcast Packets	2137376
RX FCS Errors	0
RX Fragments	0
RX MAC Control Packets	0
RX Out of Range Length	0
RX Undersize Packets	0
RX Oversize Packets	0
RX Jabbers	0
RX Control Frame Counter	0
RX Pause Frame Counter	0
RX Byte Counter	509224602
RX Unicast Frame Count	4547660
RX Packet OK Count	6685040

Statistics for port 9 connected to device RE1:

TX Packets 64 Octets	2500318
TX Packets 65-127 Octets	443
TX Packets 128-255 Octets	0
TX Packets 256-511 Octets	0
TX Packets 512-1023 Octets	0

```
TX Packets 1024-1518 Octets 0
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX Packets 9217-16383 Octets 0
TX Octets 2500761
TX Multicast Packets 4
TX Broadcast Packets 2500757
TX PAUSEMAC Ctrl Frames 0
TX Oversize Packets 0
TX FCS Error Counter 0
TX Fragment Counter 0
TX Byte Counter 160049670
TX Packet OK Counter 0
TX Pause Packet Counter 0
TX Unicast Counter 0
RX Packets 64 Octets 701191
RX Packets 65-127 Octets 5882
RX Packets 128-255 Octets 2
RX Packets 256-511 Octets 0
RX Packets 512-1023 Octets 17965
RX Packets 1024-1518 Octets 7
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Packets 9217-16383 Octets 0
RX Octets 725047
RX Multicast Packets 8
RX Broadcast Packets 2500757
RX FCS Errors 0
RX Fragments 0
RX MAC Control Packets 0
RX Out of Range Length 0
RX Undersize Packets 0
RX Oversize Packets 0
RX Jabbers 0
RX Control Frame Counter 0
RX Pause Frame Counter 0
RX Byte Counter 62402656
RX Unicast Frame Count 0
RX Packet OK Count 0
Statistics for port 17 connected to device RE0:
TX Packets 64 Octets 7214818
TX Packets 65-127 Octets 94640
TX Packets 128-255 Octets 6384
TX Packets 256-511 Octets 22027
TX Packets 512-1023 Octets 22284
TX Packets 1024-1518 Octets 49929
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX Packets 9217-16383 Octets 0
TX Octets 7410082
TX Multicast Packets 12
TX Broadcast Packets 2497247
TX PAUSEMAC Ctrl Frames 0
TX Oversize Packets 0
TX FCS Error Counter 0
TX Fragment Counter 0
TX Byte Counter 571626932
```



```

TX Packet OK Counter      0
TX Pause Packet Counter   0
TX Unicast Counter        0
RX Packets 64 Octets      4823701
RX Packets 65-127 Octets  67812
RX Packets 128-255 Octets 772
RX Packets 256-511 Octets 136
RX Packets 512-1023 Octets 68
RX Packets 1024-1518 Octets 10881
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Packets 9217-16383 Octets 0
RX Octets                  4903370
RX Multicast Packets       8
RX Broadcast Packets       2497247
RX FCS Errors              0
RX Fragments               0
RX MAC Control Packets     0
RX Out of Range Length     0
RX Undersize Packets       0
RX Oversize Packets        0
RX Jabbers                 0
RX Control Frame Counter   0
RX Pause Frame Counter     0
RX Byte Counter            326889517
RX Unicast Frame Count     0
RX Packet OK Count        0

```

Displaying port statistics for switch 1  
 Statistics for port 0 connected to device LCC0:

```

TX Packets 64 Octets      5053443
TX Packets 65-127 Octets  59737
TX Packets 128-255 Octets 768
TX Packets 256-511 Octets 87
TX Packets 512-1023 Octets 68
TX Packets 1024-1518 Octets 85
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX 1519-1522 Good Vlan frms 0
TX Octets                  5114188
TX Multicast Packets       16
TX Broadcast Packets       1125742
TX Single Collision frames 0
TX Mult. Collision frames 0
TX Late Collisions         0
TX Excessive Collisions    0
TX Collision frames        0
TX PAUSEMAC Ctrl Frames    0
TX MAC ctrl frames         0
TX Frame deferred Xmsns    0
TX Frame excessive deferl  0
TX Oversize Packets        0
TX Jabbers                 0
TX FCS Error Counter       0
TX Fragment Counter        0
TX Byte Counter            329291449
RX Packets 64 Octets      5640175
RX Packets 65-127 Octets  79875

```

```

RX Packets 128-255 Octets  6338
RX Packets 256-511 Octets  165
RX Packets 512-1023 Octets 4317
RX Packets 1024-1518 Octets 10
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Octets 5730880
RX Multicast Packets 4
RX Broadcast Packets 1735007
RX FCS Errors 0
RX Align Errors 0
RX Fragments 0
RX Symbol errors 0
RX Unsupported opcodes 0
RX Out of Range Length 0
RX False Carrier Errors 0
RX Undersize Packets 0
RX Oversize Packets 0
RX Jabbers 0
RX 1519-1522 Good Vlan frms 0
RX MTU Exceed Counter 0
RX Control Frame Counter 0
RX Pause Frame Counter 0
RX Byte Counter 371282850
Statistics for port 18 connected to device SPMB:
TX Packets 64 Octets 2990326
TX Packets 65-127 Octets 8572
TX Packets 128-255 Octets 4
TX Packets 256-511 Octets 49
TX Packets 512-1023 Octets 0
TX Packets 1024-1518 Octets 10793
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX 1519-1522 Good Vlan frms 0
TX Octets 3009744
TX Multicast Packets 20
TX Broadcast Packets 2458322
TX Single Collision frames 0
TX Mult. Collision frames 0
TX Late Collisions 0
TX Excessive Collisions 0
TX Collision frames 0
TX PAUSEMAC Ctrl Frames 0
TX MAC ctrl frames 0
TX Frame deferred Xmns 0
TX Frame excessive deferl 0
TX Oversize Packets 0
TX Jabbers 0
TX FCS Error Counter 0
TX Fragment Counter 0
TX Byte Counter 203712524
RX Packets 64 Octets 873454
RX Packets 65-127 Octets 8886
RX Packets 128-255 Octets 44
RX Packets 256-511 Octets 21862
RX Packets 512-1023 Octets 2
RX Packets 1024-1518 Octets 49912
RX Packets 1519-2047 Octets 0

```

```

RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Octets 954160
RX Multicast Packets 0
RX Broadcast Packets 402369
RX FCS Errors 0
RX Align Errors 0
RX Fragments 0
RX Symbol errors 0
RX Unsupported opcodes 0
RX Out of Range Length 0
RX False Carrier Errors 0
RX Undersize Packets 0
RX Oversize Packets 0
RX Jabbers 0
RX 1519-1522 Good Vlan frms 0
RX MTU Exceed Counter 0
RX Control Frame Counter 0
RX Pause Frame Counter 0
RX Byte Counter 137941752
...

```

#### show chassis ethernet-switch (T4000 Router)

```

user@host> show chassis ethernet-switch

Displaying summary for switch 0
Link is good on GE port 6 connected to device: FPC0
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled
  False carrier sense count = 04

Link is good on GE port 9 connected to device: FPC3
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled
  False carrier sense count = 03

Link is good on GE port 11 connected to device: FPC5
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled
  False carrier sense count = 03

Link is good on GE port 12 connected to device: FPC6
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled
  False carrier sense count = 03

Link is good on GE port 14 connected to device: SPMB
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled

Link is good on GE port 18 connected to device: RE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Disabled

```

```
Link is good on GE port 19 connected to device: Other RE
Speed is 1000Mb
Duplex is full
Autonegotiate is Enabled
```

### show chassis ethernet-switch errors (T4000 Router)

```
user@host> show chassis ethernet-switch errors

Displaying error for switch 0
Accumulated error counts for port 6 connected to device FPC0:
  MLT3      0
  Lock      0
  Xmit      0
  ESD       0
  False carrier 4
  Disconnects 0
  FX mode   0
Accumulated error counts for port 9 connected to device FPC3:
  MLT3      0
  Lock      0
  Xmit      0
  ESD       0
  False carrier 3
  Disconnects 0
  FX mode   0
Accumulated error counts for port 11 connected to device FPC5:
  MLT3      0
  Lock      0
  Xmit      0
  ESD       0
  False carrier 3
  Disconnects 0
  FX mode   0
Accumulated error counts for port 12 connected to device FPC6:
  MLT3      0
  Lock      0
  Xmit      0
  ESD       0
  False carrier 3
  Disconnects 0
  FX mode   0
Accumulated error counts for port 19 connected to device Other RE:
  MLT3      0
  Lock      0
  Xmit      0
  ESD       0
  False carrier 0
  Disconnects 0
  FX mode   0
```

### show chassis ethernet-switch (PTX5000 Packet Transport Router)

```
user@host> show chassis ethernet-switch

Displaying summary for switch 0
Link is good on XE port 2 connected to device: SPMB
```

```
Speed is 1000Mb
Duplex is full
Autonegotiate is Disabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on XE port 11 connected to device: FPC7
Speed is 1000Mb
Duplex is full
Autonegotiate is Disabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on XE port 12 connected to device: FPC6
Speed is 1000Mb
Duplex is full
Autonegotiate is Disabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on XE port 13 connected to device: FPC5
Speed is 1000Mb
Duplex is full
Autonegotiate is Disabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on XE port 15 connected to device: FPC3
Speed is 1000Mb
Duplex is full
Autonegotiate is Disabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on XE port 16 connected to device: FPC2
Speed is 1000Mb
Duplex is full
Autonegotiate is Disabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on XE port 18 connected to device: FPC0
Speed is 1000Mb
Duplex is full
Autonegotiate is Disabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on XE port 19 connected to device: OTHER RE
Speed is 1000Mb
Duplex is full
Autonegotiate is Disabled
Flow Control TX is Disabled
Flow Control RX is Disabled

Link is good on XE port 20 connected to device: RE
Speed is 1000Mb
Duplex is full
Autonegotiate is Disabled
```

```
Flow Control TX is Disabled
Flow Control RX is Disabled
```

### show chassis ethernet-switch statistics (PTX5000 Packet Transport Router)

```
user@host> show chassis ethernet-switch statistics
```

```
Displaying port statistics for switch 0
```

```
Statistics for port 2 connected to device SPMB:
```

```
TX Packets 64 Octets      10942
TX Packets 65-127 Octets  843
TX Packets 128-255 Octets 2
TX Packets 256-511 Octets 2
TX Packets 512-1023 Octets 0
TX Packets 1024-1518 Octets 6862
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX Packets 9217-16383 Octets 0
TX Octets                  18651
TX Multicast Packets        6
TX Broadcast Packets       10331
TX PAUSEMAC Ctrl Frames    0
TX Oversize Packets         0
TX FCS Error Counter        0
TX Fragment Counter         0
TX Byte Counter             8105166
TX Packet OK Counter        0
TX Pause Packet Counter     0
TX Unicast Counter          0
RX Packets 64 Octets        8679
RX Packets 65-127 Octets    2364
RX Packets 128-255 Octets    531
RX Packets 256-511 Octets    112
RX Packets 512-1023 Octets   26
RX Packets 1024-1518 Octets   8
RX Packets 1519-2047 Octets  0
RX Packets 2048-4095 Octets  0
RX Packets 4096-9216 Octets  0
RX Packets 9217-16383 Octets 0
RX Octets                   11720
RX Multicast Packets         0
RX Broadcast Packets         10331
RX FCS Errors                 0
RX Fragments                  0
RX MAC Control Packets        0
RX Out of Range Length        0
RX Undersize Packets          0
RX Oversize Packets           0
RX Jabbers                    0
RX Control Frame Counter      0
RX Pause Frame Counter        0
RX Byte Counter               938105
RX Unicast Frame Count        0
RX Packet OK Count            0
```

```
Statistics for port 11 connected to device FPC7:
```

```
TX Packets 64 Octets      14492
TX Packets 65-127 Octets  3542
TX Packets 128-255 Octets  6
TX Packets 256-511 Octets  45
```

```
TX Packets 512-1023 Octets 60
```

Continued...

Statistics for port 18 connected to device FPC0:

```
TX Packets 64 Octets      15212
TX Packets 65-127 Octets  3810
TX Packets 128-255 Octets 6
TX Packets 256-511 Octets 43
TX Packets 512-1023 Octets 66
TX Packets 1024-1518 Octets 169
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX Packets 9217-16383 Octets 0
TX Octets                  19306
TX Multicast Packets       0
TX Broadcast Packets       10886
TX PAUSEMAC Ctrl Frames    0
TX Oversize Packets        0
TX FCS Error Counter       0
TX Fragment Counter        0
TX Byte Counter            1569412
TX Packet OK Counter       0
TX Pause Packet Counter    0
TX Unicast Counter         0
RX Packets 64 Octets       17994
RX Packets 65-127 Octets   8006
RX Packets 128-255 Octets  230
RX Packets 256-511 Octets  19
RX Packets 512-1023 Octets 53
RX Packets 1024-1518 Octets 11
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Packets 9217-16383 Octets 0
RX Octets                  26313
RX Multicast Packets       0
RX Broadcast Packets       10886
RX FCS Errors              0
RX Fragments               0
RX MAC Control Packets     0
RX Out of Range Length     0
RX Undersize Packets       0
RX Oversize Packets        0
RX Jabbers                 0
RX Control Frame Counter   2
RX Pause Frame Counter     2
RX Byte Counter            1836287
RX Unicast Frame Count     0
RX Packet OK Count         0
```

Statistics for port 19 connected to device OTHER RE:

```
TX Packets 64 Octets      10234
TX Packets 65-127 Octets  162
TX Packets 128-255 Octets 0
TX Packets 256-511 Octets 0
TX Packets 512-1023 Octets 0
TX Packets 1024-1518 Octets 0
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
```

```

TX Packets 4096-9216 Octets 0
TX Packets 9217-16383 Octets 0
TX Octets 10396
TX Multicast Packets 8
TX Broadcast Packets 10317
TX PAUSEMAC Ctrl Frames 0
TX Oversize Packets 0
TX FCS Error Counter 0
TX Fragment Counter 0
TX Byte Counter 666260
TX Packet OK Counter 0
TX Pause Packet Counter 0
TX Unicast Counter 0
RX Packets 64 Octets 4073
RX Packets 65-127 Octets 325
RX Packets 128-255 Octets 1
RX Packets 256-511 Octets 0
RX Packets 512-1023 Octets 0
RX Packets 1024-1518 Octets 72
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Packets 9217-16383 Octets 0
RX Octets 4471
RX Multicast Packets 0
RX Broadcast Packets 10317
RX FCS Errors 0
RX Fragments 0
RX MAC Control Packets 0
RX Out of Range Length 0
RX Undersize Packets 0
RX Oversize Packets 0
RX Jabbers 0
RX Control Frame Counter 0
RX Pause Frame Counter 0
RX Byte Counter 387333
RX Unicast Frame Count 0
RX Packet OK Count 0
Statistics for port 20 connected to device RE:
TX Packets 64 Octets 658856
TX Packets 65-127 Octets 45535
TX Packets 128-255 Octets 1900
TX Packets 256-511 Octets 532
TX Packets 512-1023 Octets 372
TX Packets 1024-1518 Octets 191
TX Packets 1519-2047 Octets 0
TX Packets 2048-4095 Octets 0
TX Packets 4096-9216 Octets 0
TX Packets 9217-16383 Octets 0
TX Octets 707386
TX Multicast Packets 0
TX Broadcast Packets 10421
TX PAUSEMAC Ctrl Frames 0
TX Oversize Packets 0
TX FCS Error Counter 0
TX Fragment Counter 0
TX Byte Counter 46608676
TX Packet OK Counter 0
TX Pause Packet Counter 0
TX Unicast Counter 0

```



```

RX Packets 64 Octets      27394
RX Packets 65-127 Octets 20271
RX Packets 128-255 Octets 78
RX Packets 256-511 Octets 215
RX Packets 512-1023 Octets 269
RX Packets 1024-1518 Octets 253370
RX Packets 1519-2047 Octets 0
RX Packets 2048-4095 Octets 0
RX Packets 4096-9216 Octets 0
RX Packets 9217-16383 Octets 0
RX Octets                  301597
RX Multicast Packets       8
RX Broadcast Packets       10421
RX FCS Errors              0
RX Fragments               0
RX MAC Control Packets     0
RX Out of Range Length     0
RX Undersize Packets       0
RX Oversize Packets        0
RX Jabbers                 0
RX Control Frame Counter   0
RX Pause Frame Counter     0
RX Byte Counter            275043436
RX Unicast Frame Count     0
RX Packet OK Count         0

```

Continued ...

#### show chassis ethernet-switch port-state (PTX5000 Packet Transport Router)

```
user@host> show chassis ethernet-switch port-state
```

Displaying port state for switch 0

Port : 02

Target : SPMB

Error reading port 2 connected to device: SPMB

## show chassis fan

<b>List of Syntax</b>	Syntax on page 1352
	Syntax (ACX4000 Series Router) on page 1352
	Syntax (ACX5048 and ACX5096 Routers) on page 1352
	Syntax (MX Series Routers) on page 1352
	Syntax (T Series Routers) on page 1352
	Syntax (MX104, MX204, MX2010, MX2020, MX2008, and MX10003 Universal Routing Platform) on page 1352
	Syntax (MX10003 Universal Routing Platform) on page 1352
	Syntax (PTX Series) on page 1352
	Syntax (QFX Series) on page 1353
	Syntax (OCX Series) on page 1353
	Syntax (TX Matrix Router) on page 1353
	Syntax (TX Matrix Plus Router) on page 1353
	Syntax (EX9251, EX9253 Switches) on page 1353

<b>Syntax</b>	show chassis fan
<b>Syntax (ACX4000 Series Router)</b>	show chassis fan
<b>Syntax (ACX5048 and ACX5096 Routers)</b>	show chassis fan
<b>Syntax (MX Series Routers)</b>	show chassis fan <all-members> <local> <member <i>member-id</i> >
<b>Syntax (T Series Routers)</b>	show chassis fan
<b>Syntax (MX104, MX204, MX2010, MX2020, MX2008, and MX10003 Universal Routing Platform)</b>	show chassis fan <satellite [slot-id <i>slot-id</i> [device-alias <i>alias-name</i> ]]>
<b>Syntax (MX10003 Universal Routing Platform)</b>	show chassis fan
<b>Syntax (PTX Series)</b>	show chassis fan

Syntax (QFX Series)	show chassis fan <interconnect-device <i>name</i> >
Syntax (OCX Series)	show chassis fan
Syntax (TX Matrix Router)	show chassis fan <lcc <i>number</i>   scc>
Syntax (TX Matrix Plus Router)	show chassis fan <lcc <i>number</i>   sfc <i>number</i> >
Syntax (EX9251, EX9253 Switches)	show chassis fan
Release Information	<p>Command introduced in Junos OS Release 10.0 on MX Series 5G Universal Routing Platforms, M120 routers, and M320 routers, T320 routers, T640 routers, T1600 routers, TX Matrix Routers, and TX Matrix Plus routers.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 11.4 for EX Series switches.</p> <p>Command introduced in Junos OS Release 12.1 for T4000 routers.</p> <p>Command introduced in Junos OS Release 12.3 for PTX5000 Packet Transport Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 and MX2020 Universal Routing Platforms, and ACX Series Routers.</p> <p>Command introduced in Junos OS Release 13.2 for MX104 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> <p><b>satellite</b> option introduced in Junos OS Release 14.2R3.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.3 for MX150 Router Appliance.</p> <p>Command introduced in Junos OS Release 17.2 for PTX10008 Routers.</p> <p>Command introduced in Junos OS Release 17.4 for MX204 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 18.1R1 for EX9251 Switches.</p> <p>Command introduced in Junos OS Release 18.2 for EX9253 Switches.</p> <p>Command introduced in Junos OS Release 18.2 for MX10008 Universal Routing Platforms.</p>
Description	<p>(T Series routers, TX Matrix routers, TX Matrix Plus routers, M120 routers, M320 routers, MX104 routers, MX2010 routers, MX2020 routers, MX2008 routers, MX Series 5G Universal Routing Platforms, QFX3008-I Interconnect devices, QFX Series, OCX Series, EX Series switches, and PTX Series Packet Transport Routers only) Show information about the fan tray and fans.</p>
Options	<p><b>all-members</b>—(MX Series routers only) (Optional) Display information about the fan tray and fans for all members of the Virtual Chassis configuration.</p> <p><b>local</b>—(MX Series routers only) (Optional) Display information about the fan tray and fans for the local Virtual Chassis member.</p>

**member *member-id***—(MX Series routers only) (Optional) Display information about the fan tray and fans for the specified member of the Virtual Chassis configuration. For an MX Series Virtual Chassis, replace *member-id* variable with a value 0 or 1.

**interconnect-device *name***—(QFX3000-G QFabric systems only) (Optional) Display information about the fan tray and fans for the specified QFX3008-I Interconnect device.

**lcc *number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display information about the fan tray and fans for the specified T640 router (line-card chassis) that is connected to a TX Matrix router. On a TX Matrix Plus router, display information about the fan tray and fans for the specified router (line-card chassis) that is connected to a TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**satellite [*slot-id slot-id* | device-alias *alias-name*]**—(Junos Fusion only) (Optional) Display information about the fan tray and fans for the specified satellite device or devices in a Junos Fusion, or for all satellite devices if no satellite devices are specified.

**scc**—(TX Matrix routers only) (Optional) Display information about the fan tray and fans for the TX Matrix router (switch-card chassis).

**sfc *number***—(TX Matrix Plus routers only) (Optional) Display information about the fan tray and fans for the TX Matrix Plus router (switch-fabric chassis). Replace *number* variable with 0.

**Required Privilege Level**

view

**List of Sample Output**

[show chassis fan on page 1356](#)  
[show chassis fan \(QFabric Systems\) on page 1356](#)  
[show chassis fan \(EX Series Switches\) on page 1357](#)  
[show chassis fan \(T320 Router\) on page 1358](#)  
[show chassis fan \(T640 Router\) on page 1358](#)  
[show chassis fan \(T1600 Router\) on page 1359](#)  
[show chassis fan \(T4000 Core Router\) on page 1359](#)  
[show chassis fan \(TX Matrix Router\) on page 1359](#)  
[show chassis fan \(TX Matrix Plus Router\) on page 1360](#)

[show chassis fan \(TX Matrix Plus Router with 3D SIBs\) on page 1362](#)  
[show chassis fan \(PTX5000 Packet Transport Router\) on page 1364](#)  
[show chassis fan \(PTX10008 Router\) on page 1364](#)  
[show chassis fan \(MX150\) on page 1365](#)  
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[show chassis fan \(MX2008 Router\) on page 1366](#)  
[show chassis fan \(MX10003 Router\) on page 1366](#)  
[show chassis fan \(MX204 Router\) on page 1367](#)  
[show chassis fan \(MX10008 Router\) on page 1367](#)  
[show chassis fan \(ACX4000 Router\) on page 1367](#)  
[show chassis fan \(ACX5048 Router\) on page 1368](#)  
[show chassis fan \(QFX5100 Switch and OCX Series\) on page 1368](#)  
[show chassis fan \(EX9251 switches\) on page 1368](#)  
[show chassis fan \(EX9253 switches\) on page 1368](#)

**Output Fields** Table 118 on page 1355 lists the output fields for the **show chassis fan** command. Output fields are listed in the approximate order in which they appear.

*Table 118: show chassis fan Output Fields*

Field Name	Field Description
<b>Item</b>	Fan item identifier.
<b>Status</b>	Status of the fan: <ul style="list-style-type: none"> <li>• <b>OK</b>—Fan is running properly and within the normal range.</li> <li>• <b>Check</b>—Fan is in <b>Check</b> state because of some fault or alarm condition.</li> </ul>
<b>RPM</b>	(T Series routers, TX Matrix routers, TX Matrix Plus routers, MX Series 5G Universal Routing Platforms, QFX3108 Interconnect devices, and EX Series switches only) Fan speed in revolutions per minute (RPM).
<b>% RPM</b>	(MX2010 routers, MX2020 routers, MX2008 routers, and PTX Series Packet Transport Routers only) Percentage of the fan speed being used.
<b>Measurement</b>	(T Series routers, TX Matrix routers, TX Matrix Plus routers, MX Series 5G Universal Routing Platforms, QFX3108 Interconnect devices, and EX Series switches only) Fan speed status based on different chassis cooling requirements: <ul style="list-style-type: none"> <li>• Spinning at high speed</li> <li>• Spinning at intermediate speed</li> <li>• Spinning at normal speed</li> <li>• Spinning at low speed (except EX Series switches)</li> </ul> (MX2010 routers, MX2020 routers, MX2008 routers, and PTX Series Packet Transport Routers only) Fan speed in revolutions per minute (RPM) for each fan in the fan tray.

## Sample Output

### show chassis fan

```
user@host> show chassis fan
```

Item	Status	RPM	Measurement
Top Tray Fan 1	OK	3790	Spinning at normal speed
Top Tray Fan 2	OK	3769	Spinning at normal speed
Top Tray Fan 3	OK	3769	Spinning at normal speed
Top Tray Fan 4	OK	3790	Spinning at normal speed
Top Tray Fan 5	OK	3790	Spinning at normal speed
Top Tray Fan 6	OK	3769	Spinning at normal speed
Top Tray Fan 7	OK	3790	Spinning at normal speed
Top Tray Fan 8	OK	3769	Spinning at normal speed
Top Tray Fan 9	OK	3769	Spinning at normal speed
Top Tray Fan 10	OK	3790	Spinning at normal speed
Top Tray Fan 11	OK	3790	Spinning at normal speed
Top Tray Fan 12	OK	3769	Spinning at normal speed
Bottom Tray Fan 1	OK	2880	Spinning at normal speed
Bottom Tray Fan 2	OK	2912	Spinning at normal speed
Bottom Tray Fan 3	OK	2928	Spinning at normal speed
Bottom Tray Fan 4	OK	2896	Spinning at normal speed
Bottom Tray Fan 5	OK	2896	Spinning at normal speed
Bottom Tray Fan 6	OK	2928	Spinning at normal speed

### show chassis fan (QFabric Systems)

```
user@host> show chassis fan interconnect-device interconnect1
```

Item	Status	RPM	Measurement
TFT 0 Fan 0	OK	2849	Spinning at normal speed
TFT 0 Fan 1	OK	2821	Spinning at normal speed
TFT 0 Fan 2	OK	2735	Spinning at normal speed
TFT 0 Fan 3	OK	2815	Spinning at normal speed
TFT 0 Fan 4	OK	2828	Spinning at normal speed
TFT 0 Fan 5	OK	2863	Spinning at normal speed
BFT 1 Fan 0	OK	2941	Spinning at normal speed
BFT 1 Fan 1	OK	3008	Spinning at normal speed
BFT 1 Fan 2	OK	3073	Spinning at normal speed
BFT 1 Fan 3	OK	2925	Spinning at normal speed
BFT 1 Fan 4	OK	2863	Spinning at normal speed
BFT 1 Fan 5	OK	2933	Spinning at normal speed
SFT 0 Fan 0 Rotor 0	OK	15472	Spinning at normal speed
SFT 0 Fan 0 Rotor 1	OK	14477	Spinning at normal speed
SFT 0 Fan 1 Rotor 0	OK	15561	Spinning at normal speed
SFT 0 Fan 1 Rotor 1	OK	14210	Spinning at normal speed
SFT 0 Fan 2 Rotor 0	OK	16167	Spinning at normal speed
SFT 0 Fan 2 Rotor 1	OK	14248	Spinning at normal speed
SFT 0 Fan 3 Rotor 0	OK	16463	Spinning at normal speed
SFT 0 Fan 3 Rotor 1	OK	14099	Spinning at normal speed
SFT 1 Fan 0 Rotor 0	OK	15083	Spinning at normal speed
SFT 1 Fan 0 Rotor 1	OK	13533	Spinning at normal speed
SFT 1 Fan 1 Rotor 0	OK	16071	Spinning at normal speed
SFT 1 Fan 1 Rotor 1	OK	14400	Spinning at normal speed
SFT 1 Fan 2 Rotor 0	OK	15517	Spinning at normal speed
SFT 1 Fan 2 Rotor 1	OK	14210	Spinning at normal speed
SFT 1 Fan 3 Rotor 0	OK	16413	Spinning at normal speed

```

SFT 1 Fan 3 Rotor 1    OK    14400    Spinning at normal speed
SFT 2 Fan 0 Rotor 0    OK    15297    Spinning at normal speed
SFT 2 Fan 0 Rotor 1    OK    14634    Spinning at normal speed
SFT 2 Fan 1 Rotor 0    OK    15561    Spinning at normal speed
SFT 2 Fan 1 Rotor 1    OK    14285    Spinning at normal speed
SFT 2 Fan 2 Rotor 0    OK    15835    Spinning at normal speed
SFT 2 Fan 2 Rotor 1    OK    14400    Spinning at normal speed
SFT 2 Fan 3 Rotor 0    OK    15789    Spinning at normal speed
SFT 2 Fan 3 Rotor 1    OK    14323    Spinning at normal speed
SFT 3 Fan 0 Rotor 0    OK    16314    Spinning at normal speed
SFT 3 Fan 0 Rotor 1    OK    14876    Spinning at normal speed
SFT 3 Fan 1 Rotor 0    OK    15835    Spinning at normal speed
SFT 3 Fan 1 Rotor 1    OK    14323    Spinning at normal speed
SFT 3 Fan 2 Rotor 0    OK    16265    Spinning at normal speed
SFT 3 Fan 2 Rotor 1    OK    14594    Spinning at normal speed
SFT 3 Fan 3 Rotor 0    OK    16071    Spinning at normal speed
SFT 3 Fan 3 Rotor 1    OK    14323    Spinning at normal speed
SFT 4 Fan 0 Rotor 0    OK    15652    Spinning at normal speed
SFT 4 Fan 0 Rotor 1    OK    14438    Spinning at normal speed
SFT 4 Fan 1 Rotor 0    OK    16167    Spinning at normal speed
SFT 4 Fan 1 Rotor 1    OK    14555    Spinning at normal speed
SFT 4 Fan 2 Rotor 0    OK    16023    Spinning at normal speed
SFT 4 Fan 2 Rotor 1    OK    14361    Spinning at normal speed
SFT 4 Fan 3 Rotor 0    OK    16216    Spinning at normal speed
SFT 4 Fan 3 Rotor 1    OK    14438    Spinning at normal speed
SFT 5 Fan 0 Rotor 0    OK    15297    Spinning at normal speed
SFT 5 Fan 0 Rotor 1    OK    14173    Spinning at normal speed
SFT 5 Fan 1 Rotor 0    OK    15472    Spinning at normal speed
SFT 5 Fan 1 Rotor 1    OK    13846    Spinning at normal speed
SFT 5 Fan 2 Rotor 0    OK    15340    Spinning at normal speed
SFT 5 Fan 2 Rotor 1    OK    13917    Spinning at normal speed
SFT 5 Fan 3 Rotor 0    OK    15835    Spinning at normal speed
SFT 5 Fan 3 Rotor 1    OK    13917    Spinning at normal speed
SFT 6 Fan 0 Rotor 0    OK    15743    Spinning at normal speed
SFT 6 Fan 0 Rotor 1    OK    14594    Spinning at normal speed
SFT 6 Fan 1 Rotor 0    OK    16167    Spinning at normal speed
SFT 6 Fan 1 Rotor 1    OK    14634    Spinning at normal speed
SFT 6 Fan 2 Rotor 0    OK    16167    Spinning at normal speed
SFT 6 Fan 2 Rotor 1    OK    14516    Spinning at normal speed
SFT 6 Fan 3 Rotor 0    OK    16666    Spinning at normal speed
SFT 6 Fan 3 Rotor 1    OK    14438    Spinning at normal speed
SFT 7 Fan 0 Rotor 0    OK    15517    Spinning at normal speed
SFT 7 Fan 0 Rotor 1    OK    14438    Spinning at normal speed
SFT 7 Fan 1 Rotor 0    OK    15517    Spinning at normal speed
SFT 7 Fan 1 Rotor 1    OK    14361    Spinning at normal speed
SFT 7 Fan 2 Rotor 0    OK    16167    Spinning at normal speed
SFT 7 Fan 2 Rotor 1    OK    14555    Spinning at normal speed
SFT 7 Fan 3 Rotor 0    OK    15697    Spinning at normal speed
SFT 7 Fan 3 Rotor 1    OK    14361    Spinning at normal speed

```

### show chassis fan (EX Series Switches)

```
user@host> show chassis fan
```

Item	Status	RPM	Measurement
Fan 1	OK	3477	Spinning at normal speed
Fan 2	OK	3477	Spinning at normal speed
Fan 3	OK	3479	Spinning at normal speed
Fan 4	OK	3508	Spinning at normal speed

Fan 5	OK	3517	Spinning at normal speed
Fan 6	OK	3531	Spinning at normal speed
Fan 7	OK	3439	Spinning at normal speed
Fan 8	OK	3424	Spinning at normal speed
Fan 9	OK	3413	Spinning at normal speed
Fan 10	OK	3439	Spinning at normal speed
Fan 11	OK	3446	Spinning at normal speed
Fan 12	OK	3432	Spinning at normal speed

### show chassis fan (T320 Router)

```
user@host> show chassis fan
```

Item	Status	RPM	Measurement
Top Left Front fan	OK	2850	Spinning at normal speed
Top Left Middle fan	OK	2820	Spinning at normal speed
Top Left Rear fan	OK	2970	Spinning at normal speed
Top Right Front fan	OK	2790	Spinning at normal speed
Top Right Middle fan	OK	2640	Spinning at normal speed
Top Right Rear fan	OK	2790	Spinning at normal speed
Bottom Left Front fan	OK	2520	Spinning at normal speed
Bottom Left Middle fan	OK	2610	Spinning at normal speed
Bottom Left Rear fan	OK	2550	Spinning at normal speed
Bottom Right Front fan	OK	2610	Spinning at normal speed
Bottom Right Middle fan	OK	2880	Spinning at normal speed
Bottom Right Rear fan	OK	2790	Spinning at normal speed
Rear Tray Top fan	OK	2130	Spinning at normal speed
Rear Tray Second fan	OK	2190	Spinning at normal speed
Rear Tray Middle fan	OK	2250	Spinning at normal speed
Rear Tray Fourth fan	OK	2220	Spinning at normal speed
Rear Tray Bottom fan	OK	2280	Spinning at normal speed

### show chassis fan (T640 Router)

```
user@host> show chassis fan
```

Item	Status	RPM	Measurement
Top Left Front fan	OK	3420	Spinning at normal speed
Top Left Middle fan	OK	3420	Spinning at normal speed
Top Left Rear fan	OK	3420	Spinning at normal speed
Top Right Front fan	OK	3420	Spinning at normal speed
Top Right Middle fan	OK	3420	Spinning at normal speed
Top Right Rear fan	OK	3450	Spinning at normal speed
Bottom Left Front fan	OK	3390	Spinning at normal speed
Bottom Left Middle fan	OK	3420	Spinning at normal speed
Bottom Left Rear fan	OK	3390	Spinning at normal speed
Bottom Right Front fan	OK	3390	Spinning at normal speed
Bottom Right Middle fan	OK	3390	Spinning at normal speed
Bottom Right Rear fan	OK	3390	Spinning at normal speed
Rear Tray Top fan	OK	5220	Spinning at normal speed
Rear Tray Second fan	OK	5220	Spinning at normal speed
Rear Tray Third fan	OK	5220	Spinning at normal speed
Rear Tray Fourth fan	OK	5220	Spinning at normal speed
Rear Tray Fifth fan	OK	5220	Spinning at normal speed
Rear Tray Sixth fan	OK	5220	Spinning at normal speed
Rear Tray Seventh fan	OK	5220	Spinning at normal speed
Rear Tray Bottom fan	OK	5220	Spinning at normal speed



## show chassis fan (T1600 Router)

```
user@host> show chassis fan
```

Item	Status	RPM	Measurement
Top Left Front fan	OK	3420	Spinning at normal speed
Top Left Middle fan	OK	3420	Spinning at normal speed
Top Left Rear fan	OK	3450	Spinning at normal speed
Top Right Front fan	OK	3420	Spinning at normal speed
Top Right Middle fan	OK	3420	Spinning at normal speed
Top Right Rear fan	OK	3390	Spinning at normal speed
Bottom Left Front fan	OK	3420	Spinning at normal speed
Bottom Left Middle fan	OK	3420	Spinning at normal speed
Bottom Left Rear fan	OK	3390	Spinning at normal speed
Bottom Right Front fan	OK	3390	Spinning at normal speed
Bottom Right Middle fan	OK	3420	Spinning at normal speed
Bottom Right Rear fan	OK	3390	Spinning at normal speed
Rear Tray Top fan	OK	5190	Spinning at normal speed
Rear Tray Second fan	OK	5190	Spinning at normal speed
Rear Tray Third fan	OK	5190	Spinning at normal speed
Rear Tray Fourth fan	OK	5190	Spinning at normal speed
Rear Tray Fifth fan	OK	5190	Spinning at normal speed
Rear Tray Sixth fan	OK	5190	Spinning at normal speed
Rear Tray Seventh fan	OK	5190	Spinning at normal speed
Rear Tray Bottom fan	OK	5190	Spinning at normal speed

## show chassis fan (T4000 Core Router)

```
user@host> show chassis fan
```

Item	Status	RPM	Measurement
Top Left Front fan	OK	5190	Spinning at high speed
Top Left Middle fan	OK	5220	Spinning at high speed
Top Left Rear fan	OK	5190	Spinning at high speed
Top Right Front fan	OK	5160	Spinning at high speed
Top Right Middle fan	OK	5190	Spinning at high speed
Top Right Rear fan	OK	5160	Spinning at high speed
Bottom Left Front fan	OK	6030	Spinning at high speed
Bottom Left Middle fan	OK	6090	Spinning at high speed
Bottom Left Rear fan	OK	6090	Spinning at high speed
Bottom Right Front fan	OK	6030	Spinning at high speed
Bottom Right Middle fan	OK	6060	Spinning at high speed
Bottom Right Rear fan	OK	6060	Spinning at high speed
Rear Tray Top fan	OK	10000	Spinning at high speed
Rear Tray Second fan	OK	10000	Spinning at high speed
Rear Tray Third fan	OK	10000	Spinning at high speed
Rear Tray Fourth fan	OK	10000	Spinning at high speed
Rear Tray Fifth fan	OK	10000	Spinning at high speed
Rear Tray Sixth fan	OK	10000	Spinning at high speed
Rear Tray Seventh fan	OK	10000	Spinning at high speed
Rear Tray Bottom fan	OK	10000	Spinning at high speed

## show chassis fan (TX Matrix Router)

```
user@host> show chassis fan
```

```
scc-re0:
```

Item	Status	RPM	Measurement
Top Left Front fan	OK	3420	Spinning at normal speed
Top Left Middle fan	OK	3390	Spinning at normal speed
Top Left Rear fan	OK	3420	Spinning at normal speed
Top Right Front fan	OK	3390	Spinning at normal speed
Top Right Middle fan	OK	3420	Spinning at normal speed
Top Right Rear fan	OK	3390	Spinning at normal speed
Bottom Left Front fan	OK	3420	Spinning at normal speed
Bottom Left Middle fan	OK	3450	Spinning at normal speed
Bottom Left Rear fan	OK	3420	Spinning at normal speed
Bottom Right Front fan	OK	3420	Spinning at normal speed
Bottom Right Middle fan	OK	3420	Spinning at normal speed
Bottom Right Rear fan	OK	3420	Spinning at normal speed
Rear Tray Top fan	OK	3420	Spinning at normal speed
Rear Tray Second fan	OK	5190	Spinning at normal speed
Rear Tray Third fan	OK	5190	Spinning at normal speed
Rear Tray Fourth fan	OK	5190	Spinning at normal speed
Rear Tray Fifth fan	OK	3420	Spinning at normal speed
Rear Tray Sixth fan	OK	3420	Spinning at normal speed
Rear Tray Seventh fan	OK	3420	Spinning at normal speed
Rear Tray Bottom fan	OK	3420	Spinning at normal speed

lcc2-re0:

Item	Status	RPM	Measurement
Top Left Front fan	OK	3420	Spinning at normal speed
Top Left Middle fan	OK	3420	Spinning at normal speed
Top Left Rear fan	OK	3450	Spinning at normal speed
Top Right Front fan	OK	3420	Spinning at normal speed
Top Right Middle fan	OK	3450	Spinning at normal speed
Top Right Rear fan	OK	3360	Spinning at normal speed
Bottom Left Front fan	OK	3420	Spinning at normal speed
Bottom Left Middle fan	OK	3480	Spinning at normal speed
Bottom Left Rear fan	OK	3420	Spinning at normal speed
Bottom Right Front fan	OK	3420	Spinning at normal speed
Bottom Right Middle fan	OK	3390	Spinning at normal speed
Bottom Right Rear fan	OK	3420	Spinning at normal speed
Rear Tray Top fan	OK	3420	Spinning at normal speed
Rear Tray Second fan	OK	3420	Spinning at normal speed
Rear Tray Third fan	OK	3420	Spinning at normal speed
Rear Tray Fourth fan	OK	3420	Spinning at normal speed
Rear Tray Fifth fan	OK	3420	Spinning at normal speed
Rear Tray Sixth fan	OK	3420	Spinning at normal speed
Rear Tray Seventh fan	OK	3420	Spinning at normal speed
Rear Tray Bottom fan	OK	3420	Spinning at normal speed

### show chassis fan (TX Matrix Plus Router)

user@host&gt; show chassis fan

sfc0-re0:

Item	Status	RPM	Measurement
Fan Tray 0 Fan 1	OK	4350	Spinning at normal speed
Fan Tray 0 Fan 2	OK	4380	Spinning at normal speed
Fan Tray 0 Fan 3	OK	4410	Spinning at normal speed
Fan Tray 0 Fan 4	OK	4380	Spinning at normal speed
Fan Tray 0 Fan 5	OK	4350	Spinning at normal speed
Fan Tray 0 Fan 6	OK	4380	Spinning at normal speed
Fan Tray 1 Fan 1	OK	4410	Spinning at normal speed

Fan Tray 1 Fan 2	OK	4380	Spinning at normal speed
Fan Tray 1 Fan 3	OK	4410	Spinning at normal speed
Fan Tray 1 Fan 4	OK	4380	Spinning at normal speed
Fan Tray 1 Fan 5	OK	4410	Spinning at normal speed
Fan Tray 1 Fan 6	OK	4410	Spinning at normal speed
Fan Tray 2 Fan 1	OK	4380	Spinning at normal speed
Fan Tray 2 Fan 2	OK	4380	Spinning at normal speed
Fan Tray 2 Fan 3	OK	4380	Spinning at normal speed
Fan Tray 2 Fan 4	OK	4410	Spinning at normal speed
Fan Tray 2 Fan 5	OK	4380	Spinning at normal speed
Fan Tray 2 Fan 6	OK	4410	Spinning at normal speed
Fan Tray 2 Fan 7	OK	4410	Spinning at normal speed
Fan Tray 2 Fan 8	OK	4380	Spinning at normal speed
Fan Tray 2 Fan 9	OK	4380	Spinning at normal speed
Fan Tray 3 Fan 1	OK	4350	Spinning at normal speed
Fan Tray 3 Fan 2	OK	4380	Spinning at normal speed
Fan Tray 3 Fan 3	OK	4410	Spinning at normal speed
Fan Tray 3 Fan 4	OK	4440	Spinning at normal speed
Fan Tray 3 Fan 5	OK	4380	Spinning at normal speed
Fan Tray 3 Fan 6	OK	4410	Spinning at normal speed
Fan Tray 3 Fan 7	OK	4410	Spinning at normal speed
Fan Tray 3 Fan 8	OK	4380	Spinning at normal speed
Fan Tray 3 Fan 9	OK	4410	Spinning at normal speed
Fan Tray 4 Fan 1	OK	4410	Spinning at normal speed
Fan Tray 4 Fan 2	OK	4410	Spinning at normal speed
Fan Tray 4 Fan 3	OK	4380	Spinning at normal speed
Fan Tray 4 Fan 4	OK	4380	Spinning at normal speed
Fan Tray 4 Fan 5	OK	4410	Spinning at normal speed
Fan Tray 4 Fan 6	OK	4410	Spinning at normal speed
Fan Tray 4 Fan 7	OK	4410	Spinning at normal speed
Fan Tray 4 Fan 8	OK	4410	Spinning at normal speed
Fan Tray 4 Fan 9	OK	4410	Spinning at normal speed
Fan Tray 5 Fan 1	OK	4350	Spinning at normal speed
Fan Tray 5 Fan 2	OK	4380	Spinning at normal speed
Fan Tray 5 Fan 3	OK	4380	Spinning at normal speed
Fan Tray 5 Fan 4	OK	4350	Spinning at normal speed
Fan Tray 5 Fan 5	OK	4380	Spinning at normal speed
Fan Tray 5 Fan 6	OK	4410	Spinning at normal speed
Fan Tray 5 Fan 7	OK	4410	Spinning at normal speed
Fan Tray 5 Fan 8	OK	4380	Spinning at normal speed
Fan Tray 5 Fan 9	OK	4410	Spinning at normal speed

1cc0-re0:

Item	Status	RPM	Measurement
Top Left Front fan	OK	3420	Spinning at normal speed
Top Left Middle fan	OK	3420	Spinning at normal speed
Top Left Rear fan	OK	3420	Spinning at normal speed
Top Right Front fan	OK	3450	Spinning at normal speed
Top Right Middle fan	OK	3420	Spinning at normal speed
Top Right Rear fan	OK	3420	Spinning at normal speed
Bottom Left Front fan	OK	3420	Spinning at normal speed
Bottom Left Middle fan	OK	3420	Spinning at normal speed
Bottom Left Rear fan	OK	3390	Spinning at normal speed
Bottom Right Front fan	OK	3420	Spinning at normal speed
Bottom Right Middle fan	OK	3390	Spinning at normal speed
Bottom Right Rear fan	OK	3390	Spinning at normal speed
Rear Tray Top fan	OK	7050	Spinning at normal speed
Rear Tray Second fan	OK	7050	Spinning at normal speed
Rear Tray Third fan	OK	7050	Spinning at normal speed

Rear Tray Fourth fan	OK	7050	Spinning at normal speed
Rear Tray Fifth fan	OK	7050	Spinning at normal speed
Rear Tray Sixth fan	OK	7050	Spinning at normal speed
Rear Tray Seventh fan	OK	7050	Spinning at normal speed
Rear Tray Bottom fan	OK	7050	Spinning at normal speed

### show chassis fan (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fan
```

```
sfc0-re0:
```

Item	Status	RPM	Measurement
Fan Tray 0 Fan 1	OK	4830	Spinning at normal speed
Fan Tray 0 Fan 2	OK	4860	Spinning at normal speed
Fan Tray 0 Fan 3	OK	4830	Spinning at normal speed
Fan Tray 0 Fan 4	OK	4800	Spinning at normal speed
Fan Tray 0 Fan 5	OK	4830	Spinning at normal speed
Fan Tray 0 Fan 6	OK	4770	Spinning at normal speed
Fan Tray 1 Fan 1	OK	4800	Spinning at normal speed
Fan Tray 1 Fan 2	OK	4770	Spinning at normal speed
Fan Tray 1 Fan 3	OK	4800	Spinning at normal speed
Fan Tray 1 Fan 4	OK	4770	Spinning at normal speed
Fan Tray 1 Fan 5	OK	4770	Spinning at normal speed
Fan Tray 1 Fan 6	OK	4800	Spinning at normal speed
Fan Tray 2 Fan 1	OK	4800	Spinning at normal speed
Fan Tray 2 Fan 2	OK	4800	Spinning at normal speed
Fan Tray 2 Fan 3	OK	4830	Spinning at normal speed
Fan Tray 2 Fan 4	OK	4830	Spinning at normal speed
Fan Tray 2 Fan 5	OK	4830	Spinning at normal speed
Fan Tray 2 Fan 6	OK	4830	Spinning at normal speed
Fan Tray 2 Fan 7	OK	4800	Spinning at normal speed
Fan Tray 2 Fan 8	OK	4830	Spinning at normal speed
Fan Tray 2 Fan 9	OK	4800	Spinning at normal speed
Fan Tray 3 Fan 1	OK	4860	Spinning at normal speed
Fan Tray 3 Fan 2	OK	4860	Spinning at normal speed
Fan Tray 3 Fan 3	OK	4800	Spinning at normal speed
Fan Tray 3 Fan 4	OK	4830	Spinning at normal speed
Fan Tray 3 Fan 5	OK	4830	Spinning at normal speed
Fan Tray 3 Fan 6	OK	4830	Spinning at normal speed
Fan Tray 3 Fan 7	OK	4830	Spinning at normal speed
Fan Tray 3 Fan 8	OK	4800	Spinning at normal speed
Fan Tray 3 Fan 9	OK	4800	Spinning at normal speed
Fan Tray 4 Fan 1	OK	4830	Spinning at normal speed
Fan Tray 4 Fan 2	OK	4830	Spinning at normal speed
Fan Tray 4 Fan 3	OK	4830	Spinning at normal speed
Fan Tray 4 Fan 4	OK	4830	Spinning at normal speed
Fan Tray 4 Fan 5	OK	4830	Spinning at normal speed
Fan Tray 4 Fan 6	OK	4860	Spinning at normal speed
Fan Tray 4 Fan 7	OK	4800	Spinning at normal speed
Fan Tray 4 Fan 8	OK	4860	Spinning at normal speed
Fan Tray 4 Fan 9	OK	4770	Spinning at normal speed
Fan Tray 5 Fan 1	OK	4830	Spinning at normal speed
Fan Tray 5 Fan 2	OK	4830	Spinning at normal speed
Fan Tray 5 Fan 3	OK	4830	Spinning at normal speed
Fan Tray 5 Fan 4	OK	4800	Spinning at normal speed
Fan Tray 5 Fan 5	OK	4800	Spinning at normal speed
Fan Tray 5 Fan 6	OK	4800	Spinning at normal speed
Fan Tray 5 Fan 7	OK	4830	Spinning at normal speed
Fan Tray 5 Fan 8	OK	4830	Spinning at normal speed

Fan Tray 5 Fan 9		Check	2010
lcc0-re0:			
Item	Status	RPM	Measurement
Top Left Front fan	OK	3420	Spinning at normal speed
Top Left Middle fan	OK	3390	Spinning at normal speed
Top Left Rear fan	OK	3390	Spinning at normal speed
Top Right Front fan	OK	3420	Spinning at normal speed
Top Right Middle fan	OK	3420	Spinning at normal speed
Top Right Rear fan	OK	3450	Spinning at normal speed
Bottom Left Front fan	OK	3420	Spinning at normal speed
Bottom Left Middle fan	OK	3390	Spinning at normal speed
Bottom Left Rear fan	OK	3420	Spinning at normal speed
Bottom Right Front fan	OK	3420	Spinning at normal speed
Bottom Right Middle fan	OK	3390	Spinning at normal speed
Bottom Right Rear fan	OK	3420	Spinning at normal speed
Rear Tray fan 1 (Top)	OK	7740	Spinning at normal speed
Rear Tray fan 2	OK	7740	Spinning at normal speed
Rear Tray fan 3	OK	7740	Spinning at normal speed
Rear Tray fan 4	OK	7740	Spinning at normal speed
Rear Tray fan 5	OK	7740	Spinning at normal speed
Rear Tray fan 6	OK	7740	Spinning at normal speed
Rear Tray fan 7	OK	7740	Spinning at normal speed
Rear Tray fan 8	OK	7740	Spinning at normal speed
Rear Tray fan 9	OK	7740	Spinning at normal speed
Rear Tray fan 10	OK	7740	Spinning at normal speed
Rear Tray fan 11	OK	7740	Spinning at normal speed
Rear Tray fan 12	OK	7740	Spinning at normal speed
Rear Tray fan 13	OK	7740	Spinning at normal speed
Rear Tray fan 14	OK	7740	Spinning at normal speed
Rear Tray fan 15	OK	7740	Spinning at normal speed
Rear Tray fan 16 (Bottom)	OK	7740	Spinning at normal speed
lcc2-re0:			
Item	Status	RPM	Measurement
Top Left Front fan	OK	3420	Spinning at normal speed
Top Left Middle fan	OK	3390	Spinning at normal speed
Top Left Rear fan	OK	3420	Spinning at normal speed
Top Right Front fan	OK	3420	Spinning at normal speed
Top Right Middle fan	OK	3420	Spinning at normal speed
Top Right Rear fan	OK	3450	Spinning at normal speed
Bottom Left Front fan	OK	3420	Spinning at normal speed
Bottom Left Middle fan	OK	3390	Spinning at normal speed
Bottom Left Rear fan	OK	3420	Spinning at normal speed
Bottom Right Front fan	OK	3420	Spinning at normal speed
Bottom Right Middle fan	OK	3390	Spinning at normal speed
Bottom Right Rear fan	OK	3420	Spinning at normal speed
Rear Tray fan 1 (Top)	OK	7740	Spinning at normal speed
Rear Tray fan 2	OK	7740	Spinning at normal speed
Rear Tray fan 3	OK	7740	Spinning at normal speed
Rear Tray fan 4	OK	7740	Spinning at normal speed
Rear Tray fan 5	OK	7740	Spinning at normal speed
Rear Tray fan 6	OK	7740	Spinning at normal speed
Rear Tray fan 7	OK	7740	Spinning at normal speed
Rear Tray fan 8	OK	7740	Spinning at normal speed
Rear Tray fan 9	OK	7740	Spinning at normal speed
Rear Tray fan 10	OK	7740	Spinning at normal speed
Rear Tray fan 11	OK	7740	Spinning at normal speed

Rear Tray fan 12	OK	7740	Spinning at normal speed
Rear Tray fan 13	OK	7740	Spinning at normal speed
Rear Tray fan 14	OK	7740	Spinning at normal speed
Rear Tray fan 15	OK	7740	Spinning at normal speed
Rear Tray fan 16 (Bottom)	OK	7740	Spinning at normal speed

### show chassis fan (PTX5000 Packet Transport Router)

```
user@host> show chassis fan
```

```
user@host> show chassis fan
```

Item	Status	% RPM	Measurement
Fan Tray 0 Fan 1	OK	29%	2700 RPM
Fan Tray 0 Fan 2	OK	29%	2700 RPM
Fan Tray 0 Fan 3	OK	29%	2742 RPM
Fan Tray 0 Fan 4	OK	29%	2700 RPM
Fan Tray 0 Fan 5	OK	30%	2828 RPM
Fan Tray 0 Fan 6	OK	30%	2828 RPM
Fan Tray 0 Fan 7	OK	29%	2700 RPM
Fan Tray 0 Fan 8	OK	30%	2785 RPM
Fan Tray 0 Fan 9	OK	30%	2828 RPM
Fan Tray 0 Fan 10	OK	30%	2828 RPM
Fan Tray 0 Fan 11	OK	30%	2785 RPM
Fan Tray 0 Fan 12	OK	30%	2828 RPM
Fan Tray 0 Fan 13	OK	31%	2871 RPM
Fan Tray 0 Fan 14	OK	30%	2828 RPM
Fan Tray 1 Fan 1	OK	42%	3033 RPM
Fan Tray 1 Fan 2	OK	42%	3066 RPM
Fan Tray 1 Fan 3	OK	43%	3099 RPM
Fan Tray 1 Fan 4	OK	43%	3166 RPM
Fan Tray 1 Fan 5	OK	45%	3266 RPM
Fan Tray 1 Fan 6	OK	43%	3133 RPM
Fan Tray 2 Fan 1	OK	29%	2099 RPM
Fan Tray 2 Fan 2	OK	30%	2199 RPM
Fan Tray 2 Fan 3	OK	30%	2166 RPM
Fan Tray 2 Fan 4	OK	33%	2399 RPM
Fan Tray 2 Fan 5	OK	29%	2133 RPM
Fan Tray 2 Fan 6	OK	32%	2366 RPM

### show chassis fan (PTX10008 Router)

```
user@host> show chassis fan
```

Item	Status	RPM	Measurement
Fan Tray 0 Fan 0	OK	9000	Spinning at normal speed
Fan Tray 0 Fan 1	OK	9000	Spinning at normal speed
Fan Tray 0 Fan 2	OK	9150	Spinning at normal speed
Fan Tray 0 Fan 3	OK	9150	Spinning at normal speed
Fan Tray 0 Fan 4	OK	9000	Spinning at normal speed
Fan Tray 0 Fan 5	OK	9150	Spinning at normal speed
Fan Tray 0 Fan 6	OK	9000	Spinning at normal speed
Fan Tray 0 Fan 7	OK	9150	Spinning at normal speed
Fan Tray 0 Fan 8	OK	8850	Spinning at normal speed
Fan Tray 0 Fan 9	OK	8850	Spinning at normal speed
Fan Tray 0 Fan 10	OK	9000	Spinning at normal speed
Fan Tray 1 Fan 0	OK	9150	Spinning at normal speed
Fan Tray 1 Fan 1	OK	9150	Spinning at normal speed
Fan Tray 1 Fan 2	OK	9000	Spinning at normal speed
Fan Tray 1 Fan 3	OK	9000	Spinning at normal speed

Fan Tray 1 Fan 4	OK	9000	Spinning at normal speed
Fan Tray 1 Fan 5	OK	9000	Spinning at normal speed
Fan Tray 1 Fan 6	OK	9000	Spinning at normal speed
Fan Tray 1 Fan 7	OK	9150	Spinning at normal speed
Fan Tray 1 Fan 8	OK	9000	Spinning at normal speed
Fan Tray 1 Fan 9	OK	9000	Spinning at normal speed
Fan Tray 1 Fan 10	OK	9000	Spinning at normal speed

### show chassis fan (MX150)

user@host > show chassis fan

Item	Status	RPM	Measurement
FPC 0 Tray 0 Fan 0	OK	7419	Spinning at normal speed
FPC 0 Tray 1 Fan 0	OK	7419	Spinning at normal speed

### show chassis fan (MX104 Router)

user@host > show chassis fan

Item	Status	RPM	Measurement
Fan 1	OK	5640	Spinning at normal speed
Fan 2	OK	5640	Spinning at normal speed
Fan 3	OK	5760	Spinning at normal speed
Fan 4	OK	5640	Spinning at normal speed
Fan 5	OK	5640	Spinning at normal speed

### show chassis fan (MX2010 Router)

user@host > show chassis fan

Item	Status	% RPM	Measurement
Fan Tray 0 Fan 1	OK	37%	3360 RPM
Fan Tray 0 Fan 2	OK	38%	3480 RPM
Fan Tray 0 Fan 3	OK	37%	3360 RPM
Fan Tray 0 Fan 4	OK	37%	3360 RPM
Fan Tray 0 Fan 5	OK	38%	3480 RPM
Fan Tray 0 Fan 6	OK	37%	3360 RPM
Fan Tray 1 Fan 1	OK	38%	3480 RPM
Fan Tray 1 Fan 2	OK	40%	3600 RPM
Fan Tray 1 Fan 3	OK	38%	3480 RPM
Fan Tray 1 Fan 4	OK	38%	3480 RPM
Fan Tray 1 Fan 5	OK	38%	3480 RPM
Fan Tray 1 Fan 6	OK	38%	3480 RPM
Fan Tray 2 Fan 1	OK	38%	3480 RPM
Fan Tray 2 Fan 2	OK	41%	3720 RPM
Fan Tray 2 Fan 3	OK	38%	3480 RPM
Fan Tray 2 Fan 4	OK	38%	3480 RPM
Fan Tray 2 Fan 5	OK	38%	3480 RPM
Fan Tray 2 Fan 6	OK	38%	3480 RPM
Fan Tray 3 Fan 1	OK	38%	3480 RPM
Fan Tray 3 Fan 2	OK	40%	3600 RPM
Fan Tray 3 Fan 3	OK	40%	3600 RPM
Fan Tray 3 Fan 4	OK	40%	3600 RPM
Fan Tray 3 Fan 5	OK	40%	3600 RPM
Fan Tray 3 Fan 6	OK	38%	3480 RPM

## show chassis fan (MX2020 Router)

user@host &gt; show chassis fan

Item	Status	% RPM	Measurement
Fan Tray 0 Fan 1	OK	37%	3360 RPM
Fan Tray 0 Fan 2	OK	37%	3360 RPM
Fan Tray 0 Fan 3	OK	36%	3240 RPM
Fan Tray 0 Fan 4	OK	37%	3360 RPM
Fan Tray 0 Fan 5	OK	37%	3360 RPM
Fan Tray 0 Fan 6	OK	37%	3360 RPM
Fan Tray 1 Fan 1	OK	37%	3360 RPM
Fan Tray 1 Fan 2	OK	37%	3360 RPM
Fan Tray 1 Fan 3	OK	37%	3360 RPM
Fan Tray 1 Fan 4	OK	37%	3360 RPM
Fan Tray 1 Fan 5	OK	37%	3360 RPM
Fan Tray 1 Fan 6	OK	36%	3240 RPM
Fan Tray 2 Fan 1	OK	37%	3360 RPM
Fan Tray 2 Fan 2	OK	37%	3360 RPM
Fan Tray 2 Fan 3	OK	37%	3360 RPM
Fan Tray 2 Fan 4	OK	37%	3360 RPM
Fan Tray 2 Fan 5	OK	37%	3360 RPM
Fan Tray 2 Fan 6	OK	38%	3480 RPM
Fan Tray 3 Fan 1	OK	38%	3480 RPM
Fan Tray 3 Fan 2	OK	38%	3480 RPM
Fan Tray 3 Fan 3	OK	38%	3480 RPM
Fan Tray 3 Fan 4	OK	37%	3360 RPM
Fan Tray 3 Fan 5	OK	37%	3360 RPM
Fan Tray 3 Fan 6	OK	37%	3360 RPM

## show chassis fan (MX2008 Router)

user@host &gt; show chassis fan

Item	Status	% RPM	Measurement
Fan Tray 0 Fan 1	OK	64%	5760 RPM
Fan Tray 0 Fan 2	OK	62%	5640 RPM
Fan Tray 0 Fan 3	OK	64%	5760 RPM
Fan Tray 0 Fan 4	OK	60%	5400 RPM
Fan Tray 0 Fan 5	OK	61%	5520 RPM
Fan Tray 0 Fan 6	OK	62%	5640 RPM
Fan Tray 1 Fan 1	OK	61%	5520 RPM
Fan Tray 1 Fan 2	OK	61%	5520 RPM
Fan Tray 1 Fan 3	OK	61%	5520 RPM
Fan Tray 1 Fan 4	OK	62%	5640 RPM
Fan Tray 1 Fan 5	OK	62%	5640 RPM
Fan Tray 1 Fan 6	OK	64%	5760 RPM

## show chassis fan (MX10003 Router)

user@host&gt; show chassis fan

Item	Status	% RPM	Measurement
Fan Tray 0 Fan 0	OK	40%	7296 RPM
Fan Tray 0 Fan 1	OK	40%	6656 RPM
Fan Tray 0 Fan 2	OK	40%	7296 RPM
Fan Tray 0 Fan 3	OK	40%	6400 RPM
Fan Tray 1 Fan 0	OK	40%	7296 RPM
Fan Tray 1 Fan 1	OK	40%	6528 RPM



Fan Tray 1 Fan 2	OK	40%	7296 RPM
Fan Tray 1 Fan 3	OK	40%	6784 RPM
Fan Tray 2 Fan 0	OK	40%	7552 RPM
Fan Tray 2 Fan 1	OK	40%	6784 RPM
Fan Tray 2 Fan 2	OK	40%	7424 RPM
Fan Tray 2 Fan 3	OK	40%	6528 RPM
Fan Tray 3 Fan 0	OK	40%	7552 RPM
Fan Tray 3 Fan 1	OK	40%	6528 RPM
Fan Tray 3 Fan 2	OK	40%	7296 RPM
Fan Tray 3 Fan 3	OK	40%	6656 RPM

**show chassis fan (MX204 Router)**

```
user@host> show chassis fan
```

Item	Status	% RPM	Measurement
Fan Tray 0 Fan 0	OK	40%	9344 RPM
Fan Tray 0 Fan 1	OK	40%	8576 RPM
Fan Tray 1 Fan 0	OK	40%	9344 RPM
Fan Tray 1 Fan 1	OK	40%	8832 RPM
Fan Tray 2 Fan 0	OK	40%	9344 RPM
Fan Tray 2 Fan 1	OK	40%	8576 RPM

**show chassis fan (MX10008 Router)**

```
user@host> show chassis fan
```

Item	Status	RPM	Measurement
Fan Tray 0 Fan 0	OK	9750	Spinning at normal speed
Fan Tray 0 Fan 1	OK	9750	Spinning at normal speed
Fan Tray 0 Fan 2	OK	9900	Spinning at normal speed
Fan Tray 0 Fan 3	OK	9600	Spinning at normal speed
Fan Tray 0 Fan 4	Failed		
Fan Tray 0 Fan 5	Failed		
Fan Tray 0 Fan 6	OK	9750	Spinning at normal speed
Fan Tray 0 Fan 7	OK	9750	Spinning at normal speed
Fan Tray 0 Fan 8	OK	9600	Spinning at normal speed
Fan Tray 0 Fan 9	OK	9600	Spinning at normal speed
Fan Tray 0 Fan 10	OK	9600	Spinning at normal speed
Fan Tray 1 Fan 0	OK	9600	Spinning at normal speed
Fan Tray 1 Fan 1	OK	9600	Spinning at normal speed
Fan Tray 1 Fan 2	OK	9750	Spinning at normal speed
Fan Tray 1 Fan 3	OK	9600	Spinning at normal speed
Fan Tray 1 Fan 4	OK	9600	Spinning at normal speed
Fan Tray 1 Fan 5	OK	9600	Spinning at normal speed
Fan Tray 1 Fan 6	OK	9600	Spinning at normal speed
Fan Tray 1 Fan 7	OK	9750	Spinning at normal speed
Fan Tray 1 Fan 8	OK	9750	Spinning at normal speed
Fan Tray 1 Fan 9	OK	9600	Spinning at normal speed
Fan Tray 1 Fan 10	OK	9600	Spinning at normal speed

**show chassis fan (ACX4000 Router)**

```
user@host > show chassis fan
```

Item	Status	RPM	Measurement
Fan 1	OK	4140	Spinning at normal speed
Fan 2	OK	4200	Spinning at normal speed

**show chassis fan (ACX5048 Router)**

```
user@host > show chassis fan
```

Item	Status	RPM	Measurement
FPC 0 Tray 0 Fan 0	OK	18305	Spinning at normal speed
FPC 0 Tray 0 Fan 1	OK	15743	Spinning at normal speed
FPC 0 Tray 1 Fan 0	OK	18305	Spinning at normal speed
FPC 0 Tray 1 Fan 1	OK	15606	Spinning at normal speed
FPC 0 Tray 2 Fan 0	OK	19014	Spinning at normal speed
FPC 0 Tray 2 Fan 1	OK	16167	Spinning at normal speed
FPC 0 Tray 3 Fan 0	OK	18947	Spinning at normal speed
FPC 0 Tray 3 Fan 1	OK	16265	Spinning at normal speed
FPC 0 Tray 4 Fan 0	OK	18120	Spinning at normal speed
FPC 0 Tray 4 Fan 1	OK	15743	Spinning at normal speed

**show chassis fan (QFX5100 Switch and OCX Series)**

```
user@switch > show chassis fan
```

Item	Status	RPM	Measurement
FPC 0 Tray 0 Fan 0	OK	6428	Spinning at normal speed
FPC 0 Tray 0 Fan 1	OK	5515	Spinning at normal speed
FPC 0 Tray 1 Fan 0	OK	6360	Spinning at normal speed
FPC 0 Tray 1 Fan 1	OK	5532	Spinning at normal speed

**show chassis fan (EX9251 switches)**

```
user@switch > show chassis fan
```

Item	Status	% RPM	Measurement
Fan Tray 0 Fan 0	OK	40%	9600 RPM
Fan Tray 0 Fan 1	OK	40%	8832 RPM
Fan Tray 1 Fan 0	OK	40%	9728 RPM
Fan Tray 1 Fan 1	OK	40%	9088 RPM
Fan Tray 2	Absent		

**show chassis fan (EX9253 switches)**

```
user@switch > show chassis fan
```

Item	Status	% RPM	Measurement
Fan Tray 0 Fan 0	OK	40%	7552 RPM
Fan Tray 0 Fan 1	OK	40%	6272 RPM
Fan Tray 0 Fan 2	OK	40%	7552 RPM
Fan Tray 0 Fan 3	OK	40%	6272 RPM
Fan Tray 1 Fan 0	OK	40%	7552 RPM
Fan Tray 1 Fan 1	OK	40%	6272 RPM
Fan Tray 1 Fan 2	OK	40%	7552 RPM
Fan Tray 1 Fan 3	OK	40%	6272 RPM
Fan Tray 2 Fan 0	OK	40%	7552 RPM
Fan Tray 2 Fan 1	OK	40%	6400 RPM
Fan Tray 2 Fan 2	OK	40%	7552 RPM

Fan Tray 2 Fan 3	OK	40%	6272 RPM
Fan Tray 3 Fan 0	OK	40%	7552 RPM
Fan Tray 3 Fan 1	OK	40%	6400 RPM
Fan Tray 3 Fan 2	OK	40%	7552 RPM
Fan Tray 3 Fan 3	OK	40%	6272 RPM

## show chassis fabric degraded-fabric-reachability

**Syntax** `show chassis fabric degraded-fabric-reachability`

**Release Information** Command introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Routers.  
Command introduced in Junos OS Release 17.2 for PTX10008 Routers.

**Description** Display the current state of reachability between the Packet Forwarding Engines in the system.

### Additional Information

**Required Privilege Level** view

**Related Documentation**

- [show chassis fabric errors on page 1406](#)
- [show chassis fabric reachability on page 1554](#)
- [degraded on page 629](#)

**List of Sample Output** [show chassis fabric degraded-fabric-reachability on page 1370](#)

**Output Fields** [Table 119 on page 1370](#) lists the output fields for the **show chassis fabric degraded-fabric-reachability** command. Output fields are listed in the approximate order in which they appear.

*Table 119: show chassis fabric degraded-fabric-reachability Output Fields*

Field Name	Field Description
FPC	Display fabric reachability for the displayed FPC slot.
PFE	Display fabric reachability for the displayed PFE slot on a per SIB and plane basis.
SIBx_Plane y	Display the SIB (x) and plane (y) where link errors occurred.
Link errors FPC/PFEs	Display the list of FPC and PFE slots that are unreachable for the displayed SIB and plane due to link errors.

## Sample Output

### show chassis fabric degraded-fabric-reachability

```
user@host> show chassis fabric degraded-fabric-reachability
Degraded Fabric reachability Information:
FPC #0
```

```
PFE #0
  SIB0_Plane 0
    Link errors FPC/PFEs 2/0 5/0 5/1 5/2 5/3
  SIB0_Plane 1
    Link errors FPC/PFEs 2/0 5/0
PFE #1
  SIB0_Plane 0
    Link errors FPC/PFEs 2/0 5/0 5/1 5/2 5/3
  SIB0_Plane 1
    Link errors FPC/PFEs 2/0 5/0
```

## show chassis fabric destinations

<b>List of Syntax</b>	<a href="#">Syntax on page 1372</a> <a href="#">Syntax (MX240, MX480, MX960 , MX2010, MX2020, MX10003, MX10008, and MX2008 Universal Routing Platforms) on page 1372</a> <a href="#">Syntax (EX9253 Switches) on page 1372</a>
<b>Syntax</b>	show chassis fabric destinations
<b>Syntax (MX240, MX480, MX960 , MX2010, MX2020, MX10003, MX10008, and MX2008 Universal Routing Platforms)</b>	show chassis fabric destinations fpc < <i>fpc-slot-number</i> > <extended>
<b>Syntax (EX9253 Switches)</b>	show chassis fabric destinations
<b>Release Information</b>	<p>Command introduced in Junos OS Release 12.1 for MX240, MX480, and MX960 routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.</p> <p><b>extended</b> option introduced in Junos OS Release 16.1 for MX2010 and MX2020 Routers.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 18.2 for MX10008 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 18.2 for EX9253 Switches.</p>
<b>Description</b>	Display the state of fabric destinations for all FPCs.
<b>Options</b>	<p><b>none</b>—Display information about the fabric destinations of all FPCs.</p> <p><b><i>fpc-slot-number</i></b>—(Optional) Display information about the specified FPC. For MX2020 routers, replace <i>fpc-slot-number</i> with a value from 0 through 19. For MX2010 and MX2008 routers, replace <i>fpc-slot-number</i> with a value from 0 through 9. For MX10003, replace <i>fpc-slot-number</i> with a value from 0 through 1.</p> <p><b>extended</b>—(Optional) (MX2020, MX2010, and MX2008 routers with SFB2 only) Display information about the fabric destination of all 24 planes for each FPC.</p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">show chassis fabric redundancy-mode on page 1553</a></li> </ul>

- [Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 145](#)
- [MX Series Routers Fabric Resiliency on page 138](#)
- [Fabric Plane Management on MPC4E Overview on page 127](#)

#### List of Sample Output

[show chassis fabric destinations fpc 1 \(MX240 Router\) on page 1373](#)  
[show chassis fabric destinations fpc 2 \(MX480 Router\) on page 1374](#)  
[show chassis fabric destinations \(MX10008 Router\) on page 1375](#)  
[show chassis fabric destinations fpc 4 \(MX480 Router with MPC4E\) on page 1376](#)  
[show chassis fabric destinations \(MX960 Router\) on page 1377](#)  
[show chassis fabric destinations fpc 1 \(MX2020 Router\) on page 1378](#)  
[show chassis fabric destinations fpc 14 \(MX2020 Router with MPC4E\) on page 1379](#)  
[show chassis fabric destinations extended \(MX2020 Router with SFB2\) on page 1380](#)  
[show chassis fabric destinations fpc-slot-no \(MX2020 router with SFB2\) on page 1388](#)  
[show chassis fabric destinations \(MX2010 Router\) on page 1391](#)  
[show chassis fabric destinations \(MX2008 Router\) on page 1395](#)  
[show chassis fabric destinations \(MX10003 Router\) on page 1397](#)  
[show chassis fabric destinations \(MX10003 Router\) on page 1399](#)

#### Output Fields

Table 120 on page 1373 lists the output fields for the **show chassis fabric destinations** command. Output fields are listed in the approximate order in which they appear.

*Table 120: show chassis fabric destinations Output Fields*

Field Name	Field Description
Fabric destinations state	Indicates the state of the fabric destinations: <ul style="list-style-type: none"> <li>• 0—Destination is non-existent.</li> <li>• 2—Destination is enabled.</li> <li>• 3—Destination is disabled.</li> <li>• 6—Destination is in erroneous state and is disabled.</li> </ul>
Flexible PIC Concentrator (FPC) number	Source FPC number.
Packet Forwarding Engine number	Source Packet Forwarding Engine number.
Plane number	Source plane number.

#### Sample Output

##### show chassis fabric destinations fpc 1 (MX240 Router)

In the output, the values followed by the plane number denote multiple quadruples. The first quadruple specifies FPC1, the second quadruple specifies FPC2 and so on. Each quadruple specifies the states of the fabric plane to the Packet Forwarding Engines.

```
user@host> show chassis fabric destinations fpc 1
```

```
Fabric destinations state:
  0: non-existent
  2: enabled
  3: disabled
  6: dest-err and disabled
```

```
FPC 1
```

```
PFE 0
```

```
Plane 0  0000 3300 3333
Plane 1  0000 2200 2222
Plane 2  0000 2200 2222
Plane 3  0000 2200 2222
Plane 4  0000 2200 2222
Plane 5  0000 3300 3333
Plane 6  0000 3300 3333
Plane 7  0000 3300 3333
```

```
PFE 1
```

```
Plane 0  0000 3300 3333
Plane 1  0000 2200 2222
Plane 2  0000 2200 2222
Plane 3  0000 2200 2222
Plane 4  0000 2200 2222
Plane 5  0000 3300 3333
Plane 6  0000 3300 3333
Plane 7  0000 3300 3333
```

#### show chassis fabric destinations fpc 2 (MX480 Router)

```
user@host> show chassis fabric destinations fpc 2
```

```
Fabric destinations state:
  0: non-existent
  2: enabled
  3: disabled
  6: dest-err and disabled
```

```
FPC 2
```

```
PFE 0
```

```
Plane 0  0000 3300 3333
Plane 1  0000 2200 2222
Plane 2  0000 2200 2222
Plane 3  0000 2200 2222
Plane 4  0000 2200 2222
Plane 5  0000 3300 3333
Plane 6  0000 3300 3333
Plane 7  0000 3300 3333
```

```
PFE 1
```

```
Plane 0  0000 3300 3333
Plane 1  0000 2200 2222
Plane 2  0000 2200 2222
Plane 3  0000 2200 2222
Plane 4  0000 2200 2222
Plane 5  0000 3300 3333
Plane 6  0000 3300 3333
Plane 7  0000 3300 3333
```

```
PFE 2
```

```
Plane 0  0000 3300 3333
```



```

Plane 1  0000 2200 2222
Plane 2  0000 2200 2222
Plane 3  0000 2200 2222
Plane 4  0000 2200 2222
Plane 5  0000 3300 3333
Plane 6  0000 3300 3333
Plane 7  0000 3300 3333
PFE 3
Plane 0  0000 3300 3333
Plane 1  0000 2200 2222
Plane 2  0000 2200 2222
Plane 3  0000 2200 2222
Plane 4  0000 2200 2222
Plane 5  0000 3300 3333
Plane 6  0000 3300 3333
Plane 7  0000 3300 3333

```

### show chassis fabric destinations (MX10008 Router)

```
user@host> show chassis fabric destinations
```

```
Fabric destinations state:
```

```

0: non-existent
2: enabled
3: disabled
6: dest-err and disabled

```

```
FPC 1
```

```
PFE 0
```

```

Plane 0  000000 222222 000000  000000 000000 222222  000000 000000
Plane 1  000000 222222 000000  000000 000000 222222  000000 000000
Plane 2  000000 222222 000000  000000 000000 222222  000000 000000
Plane 3  000000 222222 000000  000000 000000 222222  000000 000000
Plane 4  000000 333333 000000  000000 000000 333333  000000 000000
Plane 5  000000 333333 000000  000000 000000 333333  000000 000000

```

```
PFE 1
```

```

Plane 0  000000 222222 000000  000000 000000 222222  000000 000000
Plane 1  000000 222222 000000  000000 000000 222222  000000 000000
Plane 2  000000 222222 000000  000000 000000 222222  000000 000000
Plane 3  000000 222222 000000  000000 000000 222222  000000 000000
Plane 4  000000 333333 000000  000000 000000 333333  000000 000000
Plane 5  000000 333333 000000  000000 000000 333333  000000 000000

```

```
PFE 2
```

```

Plane 0  000000 222222 000000  000000 000000 222222  000000 000000
Plane 1  000000 222222 000000  000000 000000 222222  000000 000000
Plane 2  000000 222222 000000  000000 000000 222222  000000 000000
Plane 3  000000 222222 000000  000000 000000 222222  000000 000000
Plane 4  000000 333333 000000  000000 000000 333333  000000 000000
Plane 5  000000 333333 000000  000000 000000 333333  000000 000000

```

```
PFE 3
```

```

Plane 0  000000 222222 000000  000000 000000 222222  000000 000000
Plane 1  000000 222222 000000  000000 000000 222222  000000 000000
Plane 2  000000 222222 000000  000000 000000 222222  000000 000000
Plane 3  000000 222222 000000  000000 000000 222222  000000 000000
Plane 4  000000 333333 000000  000000 000000 333333  000000 000000
Plane 5  000000 333333 000000  000000 000000 333333  000000 000000

```

```
PFE 4
```

```

Plane 0  000000 222222 000000  000000 000000 222222  000000 000000
Plane 1  000000 222222 000000  000000 000000 222222  000000 000000

```

[illegible]

show chassis fabric destinations fpc 4 (MX480 Router with MPC4E)

```
user@host > show chassis fabric destinations fpc 4
```

```

Fabric destinations state:
  0: non-existent
  2: enabled
  3: disabled
  6: dest-err and disabled

FPC 4
PFE 0
Plane 0  2200 2222 0000  2000 2200 0000
Plane 1  2200 2222 0000  2000 2200 0000
Plane 2  2200 2222 0000  2000 2200 0000
Plane 3  2200 2222 0000  2000 2200 0000
Plane 4  3300 3333 0000  3000 3300 0000
Plane 5  3300 3333 0000  3000 3300 0000
Plane 6  3300 3333 0000  3000 3300 0000
Plane 7  3300 3333 0000  3000 3300 0000
PFE 1
Plane 0  2200 2222 0000  2000 2200 0000
Plane 1  2200 2222 0000  2000 2200 0000
Plane 2  2200 2222 0000  2000 2200 0000
Plane 3  2200 2222 0000  2000 2200 0000
Plane 4  3300 3333 0000  3000 3300 0000
Plane 5  3300 3333 0000  3000 3300 0000
Plane 6  3300 3333 0000  3000 3300 0000
Plane 7  3300 3333 0000  3000 3300 0000

```

#### show chassis fabric destinations (MX960 Router)

```
user@host> show chassis fabric destinations
```

```

Fabric destinations state:
  0: non-existent
  2: enabled
  3: disabled
  6: dest-err and disabled

FPC 1
PFE 0
Plane 0  0000 3300 3333
Plane 1  0000 2200 2222
Plane 2  0000 2200 2222
Plane 3  0000 2200 2222
Plane 4  0000 2200 2222
Plane 5  0000 3300 3333
Plane 6  0000 3300 3333
Plane 7  0000 3300 3333
PFE 1
Plane 0  0000 3300 3333
Plane 1  0000 2200 2222
Plane 2  0000 2200 2222
Plane 3  0000 2200 2222
Plane 4  0000 2200 2222
Plane 5  0000 3300 3333
Plane 6  0000 3300 3333
Plane 7  0000 3300 3333
FPC 2
PFE 0
Plane 0  0000 3300 3333
Plane 1  0000 2200 2222

```

```

Plane 2  0000 2200 2222
Plane 3  0000 2200 2222
Plane 4  0000 2200 2222
Plane 5  0000 3300 3333
Plane 6  0000 3300 3333
Plane 7  0000 3300 3333
PFE 1
Plane 0  0000 3300 3333
Plane 1  0000 2200 2222
Plane 2  0000 2200 2222
Plane 3  0000 2200 2222
Plane 4  0000 2200 2222
Plane 5  0000 3300 3333
Plane 6  0000 3300 3333
Plane 7  0000 3300 3333
PFE 2
Plane 0  0000 3300 3333
Plane 1  0000 2200 2222
Plane 2  0000 2200 2222
Plane 3  0000 2200 2222
Plane 4  0000 2200 2222
Plane 5  0000 3300 3333
Plane 6  0000 3300 3333
Plane 7  0000 3300 3333
PFE 3
Plane 0  0000 3300 3333
Plane 1  0000 2200 2222
Plane 2  0000 2200 2222
Plane 3  0000 2200 2222
Plane 4  0000 2200 2222
Plane 5  0000 3300 3333
Plane 6  0000 3300 3333
Plane 7  0000 3300 3333

```

### show chassis fabric destinations fpc 1 (MX2020 Router)

```
user@host> show chassis fabric destinations fpc 1
```

```
Fabric destinations state:
```

```

0: non-existent
2: enabled
3: disabled
6: dest-err and disabled

```

```
FPC 1
```

```

PFE 0
Plane 0  3333 3333 3333  3333 3333 3333  3333 3333 3333  3333 3333 3333
3333 3333 3333  3333 3333 3333  3333 3333 3333
Plane 1  2222 2222 2222  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222  2222 2222 2222
Plane 2  2222 2222 2222  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222  2222 2222 2222
Plane 3  2222 2222 2222  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222  2222 2222 2222
Plane 4  2222 2222 2222  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222  2222 2222 2222
Plane 5  2222 2222 2222  2222 2222 2222  2222 2222 2222  2222 2222 2222
2222 2222 2222  2222 2222 2222  2222 2222 2222
Plane 6  2222 2222 2222  2222 2222 2222  2222 2222 2222  2222 2222 2222

```

```

2222 2222 2222 2222 2222 2222 2222 2222
Plane 7 2222 2222 2222 2222 2222 2222 2222
2222 2222 2222 2222 2222 2222 2222 2222
PFE 1
Plane 0 3333 3333 3333 3333 3333 3333 3333
3333 3333 3333 3333 3333 3333 3333 3333
Plane 1 2222 2222 2222 2222 2222 2222 2222
2222 2222 2222 2222 2222 2222 2222 2222
Plane 2 2222 2222 2222 2222 2222 2222 2222
2222 2222 2222 2222 2222 2222 2222 2222
Plane 3 2222 2222 2222 2222 2222 2222 2222
2222 2222 2222 2222 2222 2222 2222 2222
Plane 4 2222 2222 2222 2222 2222 2222 2222
2222 2222 2222 2222 2222 2222 2222 2222
Plane 5 2222 2222 2222 2222 2222 2222 2222
2222 2222 2222 2222 2222 2222 2222 2222
Plane 6 2222 2222 2222 2222 2222 2222 2222
2222 2222 2222 2222 2222 2222 2222 2222
Plane 7 2222 2222 2222 2222 2222 2222 2222
2222 2222 2222 2222 2222 2222 2222 2222
PFE 2
Plane 0 3333 3333 3333 3333 3333 3333 3333
3333 3333 3333 3333 3333 3333 3333 3333
Plane 1 2222 2222 2222 2222 2222 2222 2222
2222 2222 2222 2222 2222 2222 2222 2222
Plane 2 2222 2222 2222 2222 2222 2222 2222
2222 2222 2222 2222 2222 2222 2222 2222
Plane 3 2222 2222 2222 2222 2222 2222 2222
2222 2222 2222 2222 2222 2222 2222 2222
Plane 4 2222 2222 2222 2222 2222 2222 2222
2222 2222 2222 2222 2222 2222 2222 2222
Plane 5 2222 2222 2222 2222 2222 2222 2222
2222 2222 2222 2222 2222 2222 2222 2222
Plane 6 2222 2222 2222 2222 2222 2222 2222
2222 2222 2222 2222 2222 2222 2222 2222
Plane 7 2222 2222 2222 2222 2222 2222 2222
2222 2222 2222 2222 2222 2222 2222 2222
PFE 3
Plane 0 3333 3333 3333 3333 3333 3333 3333
3333 3333 3333 3333 3333 3333 3333 3333
Plane 1 2222 2222 2222 2222 2222 2222 2222
2222 2222 2222 2222 2222 2222 2222 2222
Plane 2 2222 2222 2222 2222 2222 2222 2222
2222 2222 2222 2222 2222 2222 2222 2222
Plane 3 2222 2222 2222 2222 2222 2222 2222
2222 2222 2222 2222 2222 2222 2222 2222
Plane 4 2222 2222 2222 2222 2222 2222 2222
2222 2222 2222 2222 2222 2222 2222 2222
Plane 5 2222 2222 2222 2222 2222 2222 2222
2222 2222 2222 2222 2222 2222 2222 2222
Plane 6 2222 2222 2222 2222 2222 2222 2222
2222 2222 2222 2222 2222 2222 2222 2222
Plane 7 2222 2222 2222 2222 2222 2222 2222
2222 2222 2222 2222 2222 2222 2222 2222

```

#### show chassis fabric destinations fpc 14 (MX2020 Router with MPC4E)

```
user@ host > show chassis fabric destinations fpc 14
```

## Fabric destinations state:

0: non-existent  
 2: enabled  
 3: disabled  
 6: dest-err and disabled

## FPC 14

## PFE 0

Plane 0	2200 0000 0000 0000	0000 0000 0000 0000	0000 0000 0000 0000	2200 2000 0000 0000	0000 0000
	2200 0000	0000 0000	0000 2222		
Plane 1	2200 0000 0000 0000	0000 0000 0000 0000	0000 0000 0000 0000	2200 2000 0000 0000	0000 0000
	2200 0000	0000 0000	0000 2222		
Plane 2	2200 0000 0000 0000	0000 0000 0000 0000	0000 0000 0000 0000	2200 2000 0000 0000	0000 0000
	2200 0000	0000 0000	0000 2222		
Plane 3	2200 0000 0000 0000	0000 0000 0000 0000	0000 0000 0000 0000	2200 2000 0000 0000	0000 0000
	2200 0000	0000 0000	0000 2222		
Plane 4	2200 0000 0000 0000	0000 0000 0000 0000	0000 0000 0000 0000	2200 2000 0000 0000	0000 0000
	2200 0000	0000 0000	0000 2222		
Plane 5	2200 0000 0000 0000	0000 0000 0000 0000	0000 0000 0000 0000	2200 2000 0000 0000	0000 0000
	2200 0000	0000 0000	0000 2222		
Plane 6	2200 0000 0000 0000	0000 0000 0000 0000	0000 0000 0000 0000	2200 2000 0000 0000	0000 0000
	2200 0000	0000 0000	0000 2222		
Plane 7	2200 0000 0000 0000	0000 0000 0000 0000	0000 0000 0000 0000	2200 2000 0000 0000	0000 0000
	2200 0000	0000 0000	0000 2222		

## PFE 1

Plane 0	2200 0000 0000 0000	0000 0000 0000 0000	0000 0000 0000 0000	2200 2000 0000 0000	0000 0000
	2200 0000	0000 0000	0000 2222		
Plane 1	2200 0000 0000 0000	0000 0000 0000 0000	0000 0000 0000 0000	2200 2000 0000 0000	0000 0000
	2200 0000	0000 0000	0000 2222		
Plane 2	2200 0000 0000 0000	0000 0000 0000 0000	0000 0000 0000 0000	2200 2000 0000 0000	0000 0000
	2200 0000	0000 0000	0000 2222		
Plane 3	2200 0000 0000 0000	0000 0000 0000 0000	0000 0000 0000 0000	2200 2000 0000 0000	0000 0000
	2200 0000	0000 0000	0000 2222		
Plane 4	2200 0000 0000 0000	0000 0000 0000 0000	0000 0000 0000 0000	2200 2000 0000 0000	0000 0000
	2200 0000	0000 0000	0000 2222		
Plane 5	2200 0000 0000 0000	0000 0000 0000 0000	0000 0000 0000 0000	2200 2000 0000 0000	0000 0000
	2200 0000	0000 0000	0000 2222		
Plane 6	2200 0000 0000 0000	0000 0000 0000 0000	0000 0000 0000 0000	2200 2000 0000 0000	0000 0000
	2200 0000	0000 0000	0000 2222		
Plane 7	2200 0000 0000 0000	0000 0000 0000 0000	0000 0000 0000 0000	2200 2000 0000 0000	0000 0000
	2200 0000	0000 0000	0000 2222		

## show chassis fabric destinations extended (MX2020 Router with SFB2)

```
user@host> show chassis fabric destinations extended
```

## Fabric destinations state:

0: non-existent  
 2: enabled  
 3: disabled  
 6: dest-err and disabled

## FPC 0

## PFE 0

Plane 0	2000 2222 2200 2200	0000 0000 2000 2000	0000 0000 0000 3300
	2200 0000	0000 2200 2200 0000	2222
Plane 1	2000 2222 2200 2200	0000 0000 2000 2000	0000 0000 0000 3300
	2200 0000	0000 2200 2200 0000	2222
Plane 2	2000 2222 2200 2200	0000 0000 2000 2000	0000 0000 0000 3300
	2200 0000	0000 2200 2200 0000	2222

Plane 3	6000	3333	3300	3300	0000	0000	3000	3000	0000		0000	0000	0000	3300	
3300 0000		0000	3300	3300		0000 3333									
Plane 4	2000	2222	2200	2200	0000	0000	2000	2000	0000		0000	0000	0000	3300	
2200 0000		0000	2200	2200		0000 2222									
Plane 5	2000	2222	2200	2200	0000	0000	2000	2000	0000		0000	0000	0000	3300	
2200 0000		0000	2200	2200		0000 2222									
Plane 6	2000	2222	2200	2200	0000	0000	2000	2000	0000		0000	0000	0000	3300	
2200 0000		0000	2200	2200		0000 2222									
Plane 7	2000	2222	2200	2200	0000	0000	2000	2000	0000		0000	0000	0000	3300	
2200 0000		0000	2200	2200		0000 2222									
Plane 8	6000	3333	3300	3300	0000	0000	3000	3000	0000		0000	0000	0000	3300	
3300 0000		0000	3300	3300		0000 3333									
Plane 9	6000	3333	3300		3300	0000	0000		3000	3000	0000		0000	0000	0000
3300 3300 0000		0000	3300	3300	3300		0000 3333								
Plane 10	6000	3333	3300		3300	0000	0000		3000	3000	0000		0000	0000	0000
3300 3300 0000		0000	3300	3300		0000 3333									
Plane 11	6000	3333	3300		3300	0000	0000		3000	3000	0000		0000	0000	0000
3300 3300 0000		0000	3300	3300		0000 3333									
Plane 12	2000	2222	2200		2200	0000	0000		2000	2000	0000		0000	0000	0000
3300 2200 0000		0000	2200	2200		0000 2222									
Plane 13	2000	2222	2200		2200	0000	0000		2000	2000	0000		0000	0000	0000
3300 2200 0000		0000	2200	2200		0000 2222									
Plane 14	2000	2222	2200		2200	0000	0000		2000	2000	0000		0000	0000	0000
3300 2200 0000		0000	2200	2200		0000 2222									
Plane 15	2000	2222	2200		2200	0000	0000		2000	2000	0000		0000	0000	0000
3300 2200 0000		0000	2200	2200		0000 2222									
Plane 16	2000	2222	2200		2200	0000	0000		2000	2000	0000		0000	0000	0000
3300 2200 0000		0000	2200	2200		0000 2222									
Plane 17	2000	2222	2200		2200	0000	0000		2000	2000	0000		0000	0000	0000
3300 2200 0000		0000	2200	2200		0000 2222									
Plane 18	3000	3333	3300		3300	0000	0000		3000	3000	0000		0000	0000	0000
3300 3300 0000		0000	3300	3300		0000 3333									
Plane 19	3000	3333	3300		3300	0000	0000		3000	3000	0000		0000	0000	0000
3300 3300 0000		0000	3300	3300		0000 3333									
Plane 20	3000	3333	3300		330										

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[illegible]

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[illegible]

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3300	3200	0000	0000	2200	2200	0000	2222												
Plane 10	3000		2222	2200		3300	0000	0000		3000	3000	0000		0000	0000	0000			
3300	3200	0000	0000	2200	2200	0000	2222												
Plane 11	3000		2222	2200		3300	0000	0000		3000	3000	0000		0000	0000	0000			
3300	3200	0000	0000	2200	2200	0000	2222												
Plane 12	2000		2222	2200		2200	0000	0000		2000	2000	0000		0000	0000	0000			
3300	2200	0000	0000	2200	2200	0000	2222												
Plane 13	2000		2222	2200		2200	0000	0000		2000	2000	0000		0000	0000	0000			
3300	2200	0000	0000	2200	2200	0000	2222												
Plane 14	2000		2222	2200		2200	0000	0000		2000	2000	0000		0000	0000	0000			
3300	2200	0000	0000	2200	2200	0000	2222												
Plane 15	2000		2222	2200		2200	0000	0000		2000	2000	0000		0000	0000	0000			
3300	2200	0000	0000	2200	2200	0000	2222												
Plane 16	2000		2222	2200		2200	0000	0000		2000	2000	0000		0000	0000	0000			
3300	2200	0000	0000	2200	2200	0000	2222												
Plane 17	2000		2222	2200		2200	0000	0000		2000	2000	0000		0000	0000	0000			
3300	2200	0000	0000	2200	2200	0000	2222												
Plane 18	3000		3333	3300		3300	0000	0000		3000	3000	0000		0000	0000	0000			
3300	3300	0000	0000	3300	3300	0000	3333												
Plane 19	3000		3333	3300		3300	0000	0000		3000	3000	0000		0000	0000	0000			
3300	3300	0000	0000	3300	3300	0000	3333												
Plane 20	3000		3333	3300		3300	0000	0000		3000	3000	0000		0000	0000	0000			
3300	3300	0000	0000	3300	3300	0000	3333												
Plane 21	3000		2222	2200		3300	0000	0000		3000	3000	0000		0000	0000	0000			
3300	2200	0000	0000	2200	2200	0000	2222												
Plane 22	2000		2222	2200		2200	0000	0000		2000	2000	0000		0000	0000	0000			
3300	2200	0000	0000	2200	2200	0000	2222												
Plane 23	2000		2222	2200		2200	0000	0000		2000	2000	0000		0000	0000	0000			
3300	2200	0000	0000	2200	2200	0000	2222												
PFE 3																			
Plane 0	2000		2222	2200		2200	0000												

```

Plane 15  2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 0000 2222
Plane 16  2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 0000 2222
Plane 17  2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 0000 2222
Plane 18  3000 3333 3300  3300 0000 0000  3000 3000 0000  0000 0000 0000
3300 3300 0000  0000 3300 3300  0000 0000 3333
Plane 19  3000 3333 3300  3300 0000 0000  3000 3000 0000  0000 0000 0000
3300 3300 0000  0000 3300 3300  0000 0000 3333
Plane 20  3000 3333 3300  3300 0000 0000  3000 3000 0000  0000 0000 0000
3300 3300 0000  0000 3300 3300  0000 0000 3333
Plane 21  3000 2222 2200  3300 0000 0000  3000 3000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 0000 2222
Plane 22  2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 0000 2222
Plane 23  2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 0000 2222

```

### show chassis fabric destinations fpc-slot-no (MX2020 router with SFB2)

```
user@host> show chassis fabric destination fpc 19 extended
```

```
Fabric destinations state:
```

```

0: non-existent
2: enabled
3: disabled
6: dest-err and disabled

```

```
FPC 19
```

```
PFE 0
```

```

Plane 0  2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 0000 2222
Plane 1  2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 0000 2222
Plane 2  2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 0000 2222
Plane 3  3000 2222 2200  2200 0000 0000  3000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 0000 2222
Plane 4  2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 0000 2222
Plane 5  2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 0000 2222
Plane 6  2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 0000 2222
Plane 7  2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 0000 2222
Plane 8  3000 2222 2200  3300 0000 0000  3000 3000 0000  0000 0000 0000
3300 3200 0000  0000 2200 2200  0000 0000 2222
Plane 9  3000 2222 2200  3300 0000 0000  3000 3000 0000  0000 0000 0000
3300 3200 0000  0000 2200 2200  0000 0000 2222
Plane 10 3000 2222 2200  3300 0000 0000  3000 3000 0000  0000 0000 0000
3300 3200 0000  0000 2200 2200  0000 0000 2222
Plane 11 3000 2222 2200  3300 0000 0000  3000 3000 0000  0000 0000 0000
3300 3200 0000  0000 2200 2200  0000 0000 2222
Plane 12 2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 0000 2222
Plane 13 2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 0000 2222
Plane 14 2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000

```

3300	2200	0000	0000	2200	2200	0000	2222												
Plane 15	2000	2222	2200	2200	0000	0000		2000	2000	0000	0000	0000	0000						
3300	2200	0000	0000	2200	2200	0000	2222												
Plane 16	2000	2222	2200	2200	0000	0000		2000	2000	0000	0000	0000	0000						
3300	2200	0000	0000	2200	2200	0000	2222												
Plane 17	2000	2222	2200	2200	0000	0000		2000	2000	0000	0000	0000	0000						
3300	2200	0000	0000	2200	2200	0000	2222												
Plane 18	3000	3333	3300	3300	0000	0000		3000	3000	0000	0000	0000	0000						
3300	3300	0000	0000	3300	3300	0000	3333												
Plane 19	3000	3333	3300	3300	0000	0000		3000	3000	0000	0000	0000	0000						
3300	3300	0000	0000	3300	3300	0000	3333												
Plane 20	3000	3333	3300	3300	0000	0000		3000	3000	0000	0000	0000	0000						
3300	3300	0000	0000	3300	3300	0000	3333												
Plane 21	3000	2222	2200	3300	0000	0000		3000	3000	0000	0000	0000	0000						
3300	2200	0000	0000	2200	2200	0000	2222												
Plane 22	2000	2222	2200	2200	0000	0000		2000	2000	0000	0000	0000	0000						
3300	2200	0000	0000	2200	2200	0000	2222												
Plane 23	2000	2222	2200	2200	0000	0000		2000	2000	0000	0000	0000	0000						
3300	2200	0000	0000	2200	2200	0000	2222												
PFE 1																			
Plane 0	2000	2222	2200	2200	0000	0000		2000	2000	0000	0000	0000	0000						
3300	2200	0000	0000	2200	2200	0000	2222												
Plane 1	2000	2222	2200	2200	0000	0000		2000	2000	0000	0000	0000	0000						
3300	2200	0000	0000	2200	2200	0000	2222												
Plane 2	2000	2222	2200	2200	0000	0000		2000	2000	0000	0000	0000	0000						
3300	2200	0000	0000	2200	2200	0000	2222												
Plane 3	3000	2222	2200	2200	0000	0000		3000	2000	0000	0000	0000	0000						
3300	2200	0000	0000	2200	2200	0000	2222												
Plane 4	2000	2222	2200	2200	0000	0000		2000	2000	0000	0000	0000	0000						
3300	2200	0000	0000	2200	2200	0000	2222												
Plane 5	2000	2222	2200	2200	0000	0000													





```

Plane 1  2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 2222
Plane 2  2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 2222
Plane 3  3000 2222 2200  2200 0000 0000  3000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 2222
Plane 4  2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 2222
Plane 5  2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 2222
Plane 6  2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 2222
Plane 7  2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 2222
Plane 8  3000 2222 2200  3300 0000 0000  3000 3000 0000  0000 0000 0000
3300 3200 0000  0000 2200 2200  0000 2222
Plane 9  3000 2222 2200  3300 0000 0000  3000 3000 0000  0000 0000 0000
3300 3200 0000  0000 2200 2200  0000 2222
Plane 10 3000 2222 2200  3300 0000 0000  3000 3000 0000  0000 0000 0000
3300 3200 0000  0000 2200 2200  0000 2222
Plane 11 3000 2222 2200  3300 0000 0000  3000 3000 0000  0000 0000 0000
3300 3200 0000  0000 2200 2200  0000 2222
Plane 12 2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 2222
Plane 13 2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 2222
Plane 14 2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 2222
Plane 15 2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 2222
Plane 16 2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 2222
Plane 17 2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 2222
Plane 18 3000 3333 3300  3300 0000 0000  3000 3000 0000  0000 0000 0000
3300 3300 0000  0000 3300 3300  0000 3333
Plane 19 3000 3333 3300  3300 0000 0000  3000 3000 0000  0000 0000 0000
3300 3300 0000  0000 3300 3300  0000 3333
Plane 20 3000 3333 3300  3300 0000 0000  3000 3000 0000  0000 0000 0000
3300 3300 0000  0000 3300 3300  0000 3333
Plane 21 3000 2222 2200  3300 0000 0000  3000 3000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 2222
Plane 22 2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 2222
Plane 23 2000 2222 2200  2200 0000 0000  2000 2000 0000  0000 0000 0000
3300 2200 0000  0000 2200 2200  0000 2222

```

### show chassis fabric destinations (MX2010 Router)

```
user@host> show chassis fabric destinations
```

```
Fabric destinations state:
```

```

0: non-existent
2: enabled
3: disabled
6: dest-err and disabled

```

```
FPC 0
```

```
PFE 0
```

```
Plane 0  2200 2000 2200  2222 2000 2200  2222 2200 2000  2200
```

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[illegible]

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```

Plane 0  2200 2000 2200  2222 2000 2200  2222 2200 2000  2200
Plane 1  2200 2000 2200  2222 2000 2200  2222 2200 2000  2200
Plane 2  2200 2000 2200  2222 2000 2200  2222 2200 2000  2200
Plane 3  3300 3000 3300  3333 3000 3300  3333 3300 3000  3300
Plane 4  2200 2000 2200  2222 2000 2200  2222 2200 2000  2200
Plane 5  2200 2000 2200  2222 2000 2200  2222 2200 2000  2200
Plane 6  2200 2000 2200  2222 2000 2200  2222 2200 2000  2200
Plane 7  2200 2000 2200  2222 2000 2200  2222 2200 2000  2200
PFE 1
Plane 0  2200 2000 2200  2222 2000 2200  2222 2200 2000  2200
Plane 1  2200 2000 2200  2222 2000 2200  2222 2200 2000  2200
Plane 2  2200 2000 2200  2222 2000 2200  2222 2200 2000  2200
Plane 3  3300 3000 3300  3333 3000 3300  3333 3300 3000  3300
Plane 4  2200 2000 2200  2222 2000 2200  2222 2200 2000  2200
Plane 5  2200 2000 2200  2222 2000 2200  2222 2200 2000  2200
Plane 6  2200 2000 2200  2222 2000 2200  2222 2200 2000  2200
Plane 7  2200 2000 2200  2222 2000 2200  2222 2200 2000  2200

```

### show chassis fabric destinations (MX2008 Router)

```
user@host> show chassis fabric destinations
```

```
Fabric destinations state:
```

```

0: non-existent
2: enabled
3: disabled
6: dest-err and disabled

```

```
FPC 0
```

```
PFE 0
```

```

Plane 0  3333 3333 0000  3000 0000 3000  0000 0000 0000  0000
Plane 1  2222 2222 0000  2000 0000 2000  0000 0000 0000  0000
Plane 2  2222 2222 0000  2000 0000 2000  0000 0000 0000  0000
Plane 3  2222 2222 0000  2000 0000 2000  0000 0000 0000  0000
Plane 4  3333 3333 0000  3000 0000 3000  0000 0000 0000  0000
Plane 5  2222 2222 0000  2000 0000 2000  0000 0000 0000  0000
Plane 6  2222 2222 0000  2000 0000 2000  0000 0000 0000  0000
Plane 7  3333 3333 0000  3000 0000 3000  0000 0000 0000  0000

```

```
PFE 1
```

```

Plane 0  3333 3333 0000  3000 0000 3000  0000 0000 0000  0000
Plane 1  2222 2222 0000  2000 0000 2000  0000 0000 0000  0000
Plane 2  2222 2222 0000  2000 0000 2000  0000 0000 0000  0000
Plane 3  2222 2222 0000  2000 0000 2000  0000 0000 0000  0000
Plane 4  3333 3333 0000  3000 0000 3000  0000 0000 0000  0000
Plane 5  2222 2222 0000  2000 0000 2000  0000 0000 0000  0000
Plane 6  2222 2222 0000  2000 0000 2000  0000 0000 0000  0000
Plane 7  3333 3333 0000  3000 0000 3000  0000 0000 0000  0000

```

```
PFE 2
```

```

Plane 0  3333 3333 0000  3000 0000 3000  0000 0000 0000  0000
Plane 1  2222 2222 0000  2000 0000 2000  0000 0000 0000  0000
Plane 2  2222 2222 0000  2000 0000 2000  0000 0000 0000  0000
Plane 3  2222 2222 0000  2000 0000 2000  0000 0000 0000  0000
Plane 4  3333 3333 0000  3000 0000 3000  0000 0000 0000  0000
Plane 5  2222 2222 0000  2000 0000 2000  0000 0000 0000  0000
Plane 6  2222 2222 0000  2000 0000 2000  0000 0000 0000  0000
Plane 7  3333 3333 0000  3000 0000 3000  0000 0000 0000  0000

```

```
PFE 3
```

```

Plane 0  3333 3333 0000  3000 0000 3000  0000 0000 0000  0000
Plane 1  2222 2222 0000  2000 0000 2000  0000 0000 0000  0000
Plane 2  2222 2222 0000  2000 0000 2000  0000 0000 0000  0000

```

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Plane 6	2222	2222	0000	2000	0000	2000	0000	0000	0000	0000
Plane 7	3333	3333	0000	3000	0000	3000	0000	0000	0000	0000

### show chassis fabric destinations (MX10003 Router)

```
user@host> show chassis fabric destinations
```

```
Fabric destinations state:
  0: non-existent
  2: enabled
  3: disabled
  6: dest-err and disabled
```

```
FPC 0
PFE 0
Plane 0  2220 2220
Plane 1  2220 2220
Plane 2  2220 2220
Plane 3  2220 2220
Plane 4  2220 2220
Plane 5  2220 2220
Plane 6  2220 2220
Plane 7  2220 2220
Plane 8  2220 2220
Plane 9  2220 2220
Plane 10 2220 2220
Plane 11 2220 2220
Plane 12 2220 2220
Plane 13 2220 2220
Plane 14 2220 2220
Plane 15 2220 2220
Plane 16 2220 2220
Plane 17 2220 2220
Plane 18 2220 2220
Plane 19 2220 2220
Plane 20 2220 2220
Plane 21 2220 2220
```

```
PFE 1
Plane 0  2220 2220
Plane 1  2220 2220
Plane 2  2220 2220
Plane 3  2220 2220
Plane 4  2220 2220
Plane 5  2220 2220
Plane 6  2220 2220
Plane 7  2220 2220
Plane 8  2220 2220
Plane 9  2220 2220
Plane 10 2220 2220
Plane 11 2220 2220
Plane 12 2220 2220
Plane 13 2220 2220
Plane 14 2220 2220
Plane 15 2220 2220
Plane 16 2220 2220
Plane 17 2220 2220
Plane 18 2220 2220
Plane 19 2220 2220
Plane 20 2220 2220
```

```
Plane 21  2220 2220
PFE 2
Plane 0    2220 2220
Plane 1    2220 2220
Plane 2    2220 2220
Plane 3    2220 2220
Plane 4    2220 2220
Plane 5    2220 2220
Plane 6    2220 2220
Plane 7    2220 2220
Plane 8    2220 2220
Plane 9    2220 2220
Plane 10   2220 2220
Plane 11   2220 2220
Plane 12   2220 2220
Plane 13   2220 2220
Plane 14   2220 2220
Plane 15   2220 2220
Plane 16   2220 2220
Plane 17   2220 2220
Plane 18   2220 2220
Plane 19   2220 2220
Plane 20   2220 2220
Plane 21   2220 2220
FPC 1
PFE 0
Plane 0    2220 2220
Plane 1    2220 2220
Plane 2    2220 2220
Plane 3    2220 2220
Plane 4    2220 2220
Plane 5    2220 2220
Plane 6    2220 2220
Plane 7    2220 2220
Plane 8    2220 2220
Plane 9    2220 2220
Plane 10   2220 2220
Plane 11   2220 2220
Plane 12   2220 2220
Plane 13   2220 2220
Plane 14   2220 2220
Plane 15   2220 2220
Plane 16   2220 2220
Plane 17   2220 2220
Plane 18   2220 2220
Plane 19   2220 2220
Plane 20   2220 2220
Plane 21   2220 2220
PFE 1
Plane 0    2220 2220
Plane 1    2220 2220
Plane 2    2220 2220
Plane 3    2220 2220
Plane 4    2220 2220
Plane 5    2220 2220
Plane 6    2220 2220
Plane 7    2220 2220
Plane 8    2220 2220
Plane 9    2220 2220
Plane 10   2220 2220
```



```

Plane 11 2220 2220
Plane 12 2220 2220
Plane 13 2220 2220
Plane 14 2220 2220
Plane 15 2220 2220
Plane 16 2220 2220
Plane 17 2220 2220
Plane 18 2220 2220
Plane 19 2220 2220
Plane 20 2220 2220
Plane 21 2220 2220
PFE 2
Plane 0 2220 2220
Plane 1 2220 2220
Plane 2 2220 2220
Plane 3 2220 2220
Plane 4 2220 2220
Plane 5 2220 2220
Plane 6 2220 2220
Plane 7 2220 2220
Plane 8 2220 2220
Plane 9 2220 2220
Plane 10 2220 2220
Plane 11 2220 2220
Plane 12 2220 2220
Plane 13 2220 2220
Plane 14 2220 2220
Plane 15 2220 2220
Plane 16 2220 2220
Plane 17 2220 2220
Plane 18 2220 2220
Plane 19 2220 2220
Plane 20 2220 2220
Plane 21 2220 2220

```

#### show chassis fabric destinations (MX10003 Router)

```
user@switch> show chassis fabric destinations
```

```

Fabric destinations state:
0: non-existent
2: enabled
3: disabled
6: dest-err and disabled

```

```
FPC 0
```

```
PFE 0
```

```

Plane 0 222000 222000
Plane 1 222000 222000
Plane 2 222000 222000
Plane 3 222000 222000
Plane 4 222000 222000
Plane 5 222000 222000
Plane 6 222000 222000
Plane 7 222000 222000
Plane 8 222000 222000
Plane 9 222000 222000
Plane 10 222000 222000
Plane 11 222000 222000

```

```
Plane 12 222000 222000
Plane 13 222000 222000
Plane 14 222000 222000
Plane 15 222000 222000
Plane 16 222000 222000
Plane 17 222000 222000
Plane 18 222000 222000
Plane 19 222000 222000
Plane 20 222000 222000
Plane 21 222000 222000
PFE 1
Plane 0 222000 222000
Plane 1 222000 222000
Plane 2 222000 222000
Plane 3 222000 222000
Plane 4 222000 222000
Plane 5 222000 222000
Plane 6 222000 222000
Plane 7 222000 222000
Plane 8 222000 222000
Plane 9 222000 222000
Plane 10 222000 222000
Plane 11 222000 222000
---(more)---
Plane 12 222000 222000
Plane 13 222000 222000
Plane 14 222000 222000
Plane 15 222000 222000
Plane 16 222000 222000
---(more 32%)---
Plane 17 222000 222000
Plane 18 222000 222000
Plane 19 222000 222000
Plane 20 222000 222000
Plane 21 222000 222000
PFE 2
Plane 0 222000 222000
Plane 1 222000 222000
Plane 2 222000 222000
Plane 3 222000 222000
Plane 4 222000 222000
Plane 5 222000 222000
Plane 6 222000 222000
Plane 7 222000 222000
Plane 8 222000 222000
Plane 9 222000 222000
Plane 10 222000 222000
Plane 11 222000 222000
Plane 12 222000 222000
Plane 13 222000 222000
Plane 14 222000 222000
Plane 15 222000 222000
Plane 19 222000 222000
Plane 20 222000 222000
Plane 21 222000 222000
PFE 1
Plane 0 222000 222000
Plane 1 222000 222000
Plane 2 222000 222000
Plane 3 222000 222000
```

```
Plane 4 222000 222000
Plane 5 222000 222000
Plane 6 222000 222000
Plane 7 222000 222000
Plane 8 222000 222000
Plane 9 222000 222000
Plane 10 222000 222000
Plane 11 222000 222000
Plane 12 222000 222000
Plane 13 222000 222000
Plane 14 222000 222000
Plane 15 222000 222000
Plane 16 222000 222000
Plane 17 222000 222000
Plane 18 222000 222000
Plane 19 222000 222000
Plane 20 222000 222000
Plane 21 222000 222000
PFE 2
Plane 0 222000 222000
Plane 1 222000 222000
Plane 2 222000 222000
Plane 3 222000 222000
Plane 4 222000 222000
Plane 5 222000 222000
Plane 6 222000 222000
Plane 7 222000 222000
Plane 8 222000 222000
Plane 9 222000 222000
Plane 10 222000 222000
Plane 11 222000 222000
Plane 12 222000 222000
Plane 13 222000 222000
Plane 14 222000 222000
Plane 15 222000 222000
Plane 16 222000 222000
Plane 17 222000 222000
Plane 18 222000 222000
Plane 19 222000 222000
Plane 20 222000 222000
Plane 21 222000 222000
FPC 1
PFE 0
Plane 0 222000 222000
Plane 1 222000 222000
Plane 2 222000 222000
Plane 3 222000 222000
Plane 4 222000 222000
Plane 5 222000 222000
Plane 6 222000 222000
Plane 7 222000 222000
Plane 8 222000 222000
Plane 9 222000 222000
Plane 10 222000 222000
Plane 11 222000 222000
Plane 12 222000 222000
Plane 13 222000 222000
Plane 14 222000 222000
Plane 15 222000 222000
Plane 16 222000 222000
```

```
Plane 17 222000 222000
Plane 18 222000 222000
Plane 19 222000 222000
Plane 20 222000 222000
Plane 21 222000 222000
PFE 1
Plane 0 222000 222000
Plane 1 222000 222000
Plane 2 222000 222000
Plane 3 222000 222000
Plane 4 222000 222000
Plane 5 222000 222000
Plane 6 222000 222000
Plane 7 222000 222000
Plane 8 222000 222000
Plane 9 222000 222000
Plane 10 222000 222000
Plane 11 222000 222000
Plane 12 222000 222000
Plane 13 222000 222000
Plane 14 222000 222000
Plane 15 222000 222000
Plane 16 222000 222000
Plane 17 222000 222000
Plane 18 222000 222000
Plane 19 222000 222000
Plane 20 222000 222000
Plane 21 222000 222000
PFE 2
Plane 0 222000 222000
Plane 1 222000 222000
Plane 2 222000 222000
Plane 3 222000 222000
Plane 4 222000 222000
Plane 5 222000 222000
Plane 6 222000 222000
Plane 7 222000 222000
Plane 8 222000 222000
Plane 9 222000 222000
Plane 10 222000 222000
Plane 11 222000 222000
Plane 12 222000 222000
Plane 13 222000 222000
Plane 14 222000 222000
Plane 15 222000 222000
Plane 16 222000 222000
Plane 17 222000 222000
Plane 18 222000 222000
Plane 19 222000 222000
Plane 20 222000 222000
Plane 21 222000 222000
```

## show chassis fabric faults recovery-actions

<b>Syntax</b>	show chassis fabric faults recovery-actions
<b>Release Information</b>	Command introduced in Junos OS Release 14.2 for TX Matrix Plus routers with 3D SIBs.
<b>Description</b>	Display the last 64 recovery actions related to a fabric black-hole condition.
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">auto-recovery-disable on page 604</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">show chassis fabric faults recovery-actions on page 1403</a>
<b>Output Fields</b>	Table 119 on page 1370 lists the output fields for the <b>show chassis fabric faults recovery-actions</b> command. Output fields are listed in the approximate order in which they appear.

Table 121: show chassis fabric faults recovery-actions Output Fields

Field Name	Field Description
<b>Fault Name</b>	<p>The name of fault detected. The fault name appears in a message such as:</p> <p><b>CLOS LINK ERROR</b> detected on F2S or F13 slot <i>slot number</i> xf chip <i>chip number</i> and Link Number <i>link number</i></p>
<b>Recovery Start Time</b>	The time when recovery actions were initiated.
<b>Recovery Action</b>	<p>The recovery action that was used to recover from the mentioned fault. Recovery options depend on the type of faults and can include:</p> <ul style="list-style-type: none"> <li>• <b>SFC SIB Reboot:</b> The SFC SIB was rebooted.</li> <li>• <b>LCC SIB Reboot:</b> The LCC SIB was rebooted.</li> <li>• <b>FPC Reboot:</b> The FPC was rebooted.</li> <li>• <b>Destination Reprogramming:</b> Reenabling the data flow between Packet Forwarding Engines.</li> <li>• <b>Interchassis Link Retraining:</b> Retraining of optical links between an LCC SIB and an SFC SIB.</li> </ul>

## Sample Output

### show chassis fabric faults recovery-actions

```
user@host> show chassis fabric faults recovery-actions
```

```
Fault Name      :CLOS LINK ERROR on F2SSlot3Chip0LinkNum2
Recovery Start Time :2014-03-25 19:52:50 PDT
Recovery Action   :F2S slot 3 Reboot
```

## show chassis fabric feb

<b>Syntax</b>	show chassis fabric feb
<b>Release Information</b>	Command introduced in Junos OS Release 8.0.
<b>Description</b>	(M120 router only) Display the state of the electrical and optical switching fabric links between the Forwarding Engine Boards (FEBs) and the fabric planes, as interpreted by the FEB.
<b>Options</b>	This command has no options.
<b>Required Privilege Level</b>	view
<b>List of Sample Output</b>	<a href="#">show chassis fabric feb on page 1405</a>
<b>Output Fields</b>	Table 122 on page 1405 lists the output fields for the <b>show chassis fabric feb</b> command.

*Table 122: show chassis fabric feb Output Fields*

Field Name	Field Description
<b>Fabric management FEB state</b>	State of the switching fabric link between each FEB and fabric plane: desalination error, disabled, enabled, link error, link ok, or unused.

## Sample Output

### show chassis fabric feb

```

user@host> show chassis fabric feb

Fabric management FEB state
FEB 0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
FEB 4
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled

```

## show chassis fabric errors

**List of Syntax**    [Syntax on page 1406](#)  
[Syntax \(PTX Series Packet Transport Routers\) on page 1406](#)

**Syntax**    show chassis fabric errors  
 <autoheal>  
 <fpc slot-number lcc number>  
 <sib (slot | f13 sib-slot | f2s sib-slot/sib-f2s-slot-number | lcc number)>

**Syntax (PTX Series Packet Transport Routers)**    show chassis fabric errors  
 (autoheal | fpc slot-number | sib sib-slot)

**Release Information**    Command introduced in Junos OS Release 10.0.  
 Command introduced in Junos OS Release 12.1X48 for the PTX Series Packet Transport Routers.  
 Command introduced in Junos OS Release 17.2 for PTX10008 Routers.

**Description**    Display the first ten and last ten fabric errors for the FPC or Switch Interface Boards (SIBs).



**NOTE:** This command can only be issued on a master Routing Engine.

**Options**    **autoheal**—(TX Matrix Plus routers and PTX Series Packet Transport Routers only) Show an error log of the first 100 autoheal actions taken on the system.

**fpc slot-number**—Show error log of the first ten and last ten errors for the specified FPC.

(PTX3000 routers only)—Replace **slot-number** with an FPC slot number: **0, 2, 4, 6, 8, 10, 12, or 14**.

(PTX5000 routers only)—Replace **slot-number** with a value from **0** through **7**.

(TX Matrix Plus routers only)—Replace **fpc slot-number** with the following values depending on the LCC configuration:

- On a TX Matrix Plus router with the TXP-T1600 configuration, if you specify the number of a T1600 LCC by using the **lcc number** option (the recommended method), replace **fpc slot-number** with a value from **0** through **7**. Otherwise, use a value from **0** through **31**.
- On a TX Matrix Plus router with the TXP-T1600-3D, TXP-T4000-3D, or TXP-Mixed-LCC-3D configuration, if you specify the number of a T1600 or T4000 LCC by using the **lcc number** option (the recommended method), replace **fpc**



**slot-number** with a value from 0 through 7. Otherwise, use a value from 0 through 63.

- **lcc number**—Show error log of the first ten and last ten errors for the specified FPC on a specific network device (line-card chassis) that is part of the routing matrix.

Replace **lcc number** with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

If you specify the number of the network device by using only the **lcc number** option (the recommended method), replace **slot-number** with a value from 0 through 7. Otherwise, replace **slot-number** with a value from 0 through 31. For example, the following commands have the same result:

```
user@host> show chassis fabric errors fpc 1 lcc 1
user@host> show chassis fabric errors fpc 9
```

**sib**—Show error log of the first ten and last ten errors for the specified SIB. This option has the following suboptions:

- (TX Matrix Plus routers only) **sib-slot**—Specify a value ranging from 0 through 4.
- (PTX3000 and PTX5000 routers) **sib-slot**—Specify a value ranging from 0 through 8.
- (TX Matrix Plus routers only) **f13 sib-slot**—(Optional) Show SIB F13 errors. Specify a valid SIB value number: 0, 1, 3, 4, 6, 7, 8, 9, 11, or 12.
- (TX Matrix Plus routers only) **f2s sib-slot/sib-f2s-slot-number**—(Optional) Show SIB F2S errors. Replace **sib-slot** with a value from 0 through 4, followed by a **sib-f2s-slot-number** value 0, 2, 4 or 6.
- (TX Matrix Plus routers only) **lcc number**—(Optional) Show error log of the first ten and last ten SIB errors for the specified network device (line-card chassis).

Replace **number** with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.

- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.



**NOTE:** The `lcc number` suboption is mandatory when using the following format for the command: `show chassis fabric errors sib lcc number sib slot-number`. For instance, issuing `show chassis fabric errors sib lcc 2 3` displays errors detected on LCC 2, SIB 3.

This suboption is not required when the `f13` or `f2s` suboptions are used with the `sib slot-number` option.

**Required Privilege Level** view

**List of Sample Output** [show chassis fabric errors \(F13 SIB Errors on a TX Matrix Plus Router\) on page 1409](#)  
[show chassis fabric errors \(F2S SIB Errors on a TX Matrix Plus Router\) on page 1409](#)  
[show chassis fabric errors \(SIB Errors Specific to an LCC Connected to a TX Matrix Plus Router\) on page 1409](#)  
[show chassis fabric errors \(FPC Errors Specific to an LCC Connected to a TX Matrix Plus Router\) on page 1410](#)  
[show chassis fabric errors \(SIB Errors Specific to an LCC Connected to a TX Matrix Plus Router with 3D SIBs\) on page 1410](#)  
[show chassis fabric errors fpc or sib \(PTX Series Packet Transport Routers\) on page 1410](#)  
[show chassis fabric errors autoheal \(PTX Series Packet Transport Routers\) on page 1410](#)  
[show chassis fabric errors autoheal \(TX Matrix Plus Router with 3D SIBs\) on page 1410](#)

**Output Fields** [Table 123 on page 1408](#) lists the output fields for the `show chassis fabric errors` command. Output fields are listed in the approximate order in which they appear.

*Table 123: show chassis fabric errors Output Fields*

Field Name	Field Description
Time	Time the error was logged.  (TX Matrix Plus routers and PTX Series Packet Transport Routers only) For the <code>autoheal</code> option, shows the timestamp when autoheal was attempted on a SIB that was in fault state.
Error log of first 10 errors	List of the first ten errors.
Error log of last 10 errors	List of the last ten errors.

Table 123: show chassis fabric errors Output Fields (continued)

Field Name	Field Description
<b>Error log of first 100 errors</b>	<p>Indicates the autoheal action taken on the SIB. The following actions can occur:</p> <ul style="list-style-type: none"> <li>• Req—A SIB autoheal request was made on a faulty SIB.</li> <li>• Action—Autohealing (taking the SIB offline and then online) is initiated.</li> <li>• Denied—Autohealing (taking the SIB offline and then online) is denied because the SIB went to a fault state before the autoheal configuration period completed.</li> <li>• Set info—Setting information to force skipping autoheal on the SIB so that no further attempts to autoheal the faulty SIB are made.</li> <li>• Clear info— if a user takes a SIB offline and then online, then the autoheal information of the SIB is cleared. If the SIB goes to a fault state, autoheal is attempted on the SIB.</li> <li>• (PTX3000 and PTX5000 routers only) Completed—Autohealing is completed. This message is displayed whether autohealing is succesful or not.</li> </ul>
<b>fpc slot number</b>	(PTX5000 Packet Transport Router only)—Range is 0 through 7.
<b>sib slot number</b>	(PTX Series Packet Transport Routers only)—Range is 0 through 8.
<b>lcc number</b>	Not supported on PTX Series Packet Transport Routers.

## Sample Output

### show chassis fabric errors (F13 SIB Errors on a TX Matrix Plus Router)

```
user@host> show chassis fabric errors sib f13 11
```

```
Time                               Error log of first 10 errors
2009-10-06 02:21:17 PDT           LOS on Cable-D(1,0)
```

### show chassis fabric errors (F2S SIB Errors on a TX Matrix Plus Router)

```
user@host> show chassis fabric errors sib f2s 0/0
```

```
Time                               Error log of first 10 errors
2009-10-06 13:51:42 PDT           Cell drop errors on CLOS F2 SF 0 Port 0 link
```

### show chassis fabric errors (SIB Errors Specific to an LCC Connected to a TX Matrix Plus Router)

```
user@host> show chassis fabric errors sib 1 lcc 0
```

```
lcc0-re0:
```

Time	Error log of first 10 errors
2009-10-06 02:23:16 PDT	Cell drop errors on FPC7_T link
2009-10-06 02:23:16 PDT	Cell drop errors on FPC7_B link

### show chassis fabric errors (FPC Errors Specific to an LCC Connected to a TX Matrix Plus Router)

```
user@host> show chassis fabric errors fpc 5 lcc 0
```

lcc0-re0:

---

Time	Error log of first 10 errors
2009-10-06 13:56:59 PDT	PFE_T has link error on plane 1

### show chassis fabric errors (SIB Errors Specific to an LCC Connected to a TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric errors sib 1 lcc 0
```

lcc0-re0:

---

Time	Error log of first 10 errors
2013-02-11 04:46:42 PST	CRC errors on XC link SIB01_XF3#11,0

### show chassis fabric errors fpc or sib (PTX Series Packet Transport Routers)

```
user@host> show chassis fabric errors fpc 1
```

Time	Error log of first 10 errors
2012-01-06 16:27:03 PST	Link errs on PFE 2, SIB 0, Plane 0

```
user@host> show chassis fabric errors sib 1
```

Time	Error log of first 10 errors
2015-01-16 15:34:33 PST	Link errs on PFE 0, FPC 0, Plane 2
2015-01-16 15:44:33 PST	CM set ASIC 1 to FAULT (Fault due to PIO errors)

### show chassis fabric errors autoheal (PTX Series Packet Transport Routers)

```
user@host> show chassis fabric errors autoheal
```

Mar 30 01:43:00

Time	Error log of first 100 errors
2016-03-29 23:46:23 PDT	Req: sib 0
2016-03-29 23:46:23 PDT	Action: SIB 0 (autohealing)
2016-03-29 23:54:52 PDT	Completed: SIB 0 (autoheal)

### show chassis fabric errors autoheal (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric errors autoheal
```

Time	Error log of first 100 errors
2013-03-25 00:16:10 PDT	Req: Plane 3 F13 8 Cb1 4 (tx) LCC0-SIB3 Cb1 4 (rx)
2013-03-25 00:16:12 PDT	Action: Plane 3 F13 8 Cb1 4 (autohealing)

```
2013-03-25 00:17:24 PDT Req: Plane 3 F13 8 Cbl 4 (tx) LCC0-SIB3 Cbl 4 (rx)
2013-03-25 00:17:24 PDT Denied: Plane 3 F13 8 Cbl 4 (time < configured)
2013-03-25 00:17:24 PDT Set info: Plane 3 F13 8 Cbl 4 (skip autoheal)
2013-03-25 01:20:17 PDT Clear info: Plane 3
```

## show chassis fabric fpcs

- List of Syntax**
- Syntax on page 1412
  - Syntax (MX Series Routers) on page 1412
  - Syntax (MX2010, MX2020, MX10003, MX10008, and MX2008 Universal Routing Platforms) on page 1412
  - Syntax (T4000 Core Router) on page 1412
  - Syntax (PTX Series Packet Transport Routers) on page 1412
  - Syntax (TX Matrix Plus Router) on page 1412
  - Syntax (QFX Series Switches) on page 1412
  - Syntax (EX9253 Switches) on page 1412
  - Syntax (EX9253 Switches) on page 1413

**Syntax** show chassis fabric fpcs  
<lcc *number*>

**Syntax (MX Series Routers)** show chassis fabric fpcs  
<extended>  
<all-members>  
<local>  
<member *member-id*>

**Syntax (MX2010, MX2020, MX10003, MX10008, and MX2008 Universal Routing Platforms)** show chassis fabric fpcs

**Syntax (T4000 Core Router)** show chassis fabric fpcs

**Syntax (PTX Series Packet Transport Routers)** show chassis fabric fpcs <slot *fpc-slot*>

**Syntax (TX Matrix Plus Router)** show chassis fabric fpcs  
<lcc *number*>

**Syntax (QFX Series Switches)** show chassis fabric fpcs <slot *fpc-slot*>

**Syntax (EX9253 Switches)** show chassis fabric fpcs

<b>Syntax (EX9253 Switches)</b>	<code>show chassis fabric fpcs</code>
<b>Release Information</b>	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.4 for EX Series switches.</p> <p>Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 15.1X53-D30 for QFX Series switches.</p> <p><b>extended</b> option introduced in JunosOS Release 16.1 for MX2020 and MX2010 Routers.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.2 for PTX10008 Routers.</p> <p>Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 18.2 for EX9253 Switches.</p>
<b>Description</b>	Display the state of the electrical switch fabric links between the Flexible PIC Concentrators (FPCs) and the Switch Interface Boards (SIBs).
<b>Options</b>	<p><b>none</b>—Display the switch fabric link state. On a TX Matrix router, display the switching fabric link states for the FPCs in all T640 routers connected to the TX Matrix router. On a TX Matrix Plus router, display the switching fabric link states for the FPCs in all routers connected to the TX Matrix Plus router.</p> <p><b>extended</b>—(MX2020 and MX2010 Routers with SFB2) (Optional) Display the fabric link state for all 24 fabric planes.</p> <p><b>all-members</b>—(MX Series routers only) (Optional) Display the switching fabric link states for the FPCs in all members of the Virtual Chassis configuration.</p> <p><b>lcc number</b>—(TX Matrix router and TX Matrix Plus router only) (Optional) On a TX Matrix router, display the switch fabric link state for the FPCs in the specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display the switch fabric link state for the FPCs in the specified router (line-card chassis) that is connected to the TX Matrix Plus router. Replace <b>number</b> with a following value depending on the LCC configurations:</p> <ul style="list-style-type: none"> <li>• From <b>0</b> through <b>3</b> on a T640 router on the routing matrix with TX Matirx routers.</li> <li>• From <b>0</b> through <b>3</b> on a T1600 router on the routing matrix with TX Matirx Plus routers.</li> <li>• From <b>0</b> through <b>7</b> on a T1600 router in a routing matrix with TX Matrix Plus router with 3D SIBs.</li> <li>• <b>0, 2, 4, 6</b> on a T4000 router in a routing matrix with TX Matrix Plus router with 3D SIBs.</li> </ul> <p><b>local</b>—(MX Series routers only) (Optional) Display the switching fabric link states for the FPCs in the local Virtual Chassis member.</p>

**member *member-id***—(MX Series routers only) (Optional) Display the switching fabric link states for the FPCs in the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

**slot *fpc-slot***—(PTX Series Packet Transport Routers and QFX Series switches only) (Optional) Display the fabric state of the specified FPC slot. If no value is provided, display the status of all FPCs.

**Required Privilege Level**

view

**Related Documentation**

- [request chassis fabric fpc](#)
- [show chassis fpc on page 1666](#)
- [Displaying Information About DPCs or FPCs in an MX Series Router](#)

**List of Sample Output**

[show chassis fabric fpcs \(M320 Router\) on page 1416](#)  
[show chassis fabric fpcs \(MX240 Router\) on page 1416](#)  
[show chassis fabric fpcs \(MX10008 Router\) on page 1417](#)  
[show chassis fabric fpcs \(MX480 Router\) on page 1418](#)  
[show chassis fabric fpcs \(MX960 Router\) on page 1419](#)  
[show chassis fabric fpcs \(MX240 with AS MLC Modular Carrier Card\) on page 1420](#)  
[show chassis fabric fpcs \(MX480 with AS MLC Modular Carrier Card\) on page 1421](#)  
[show chassis fabric fpcs \(MX480 Router with MPC4E\) on page 1422](#)  
[show chassis fabric fpcs \(MX960 with AS MLC Modular Carrier Card on page 1423](#)  
[show chassis fabric fpcs \(MX2010 Router\) on page 1425](#)  
[show chassis fabric fpcs \(MX2020 Router\) on page 1428](#)  
[show chassis fabric fpcs \(MX2020 Router with MPC4E\) on page 1431](#)  
[show chassis fabric fpcs \(MX2020 Router with SFB2\) on page 1433](#)  
[show chassis fabric fpcs \(MX2008 Router\) on page 1436](#)  
[show chassis fabric fpcs \(MX10003 Router\) on page 1438](#)  
[show chassis fabric fpcs \(T320 Router\) on page 1439](#)  
[show chassis fabric fpcs \(T640 Router\) on page 1440](#)  
[show chassis fabric fpcs \(TX Matrix Router\) on page 1440](#)  
[show chassis fabric fpcs \(TX Matrix Router with 3D SIBs\) on page 1442](#)  
[show chassis fabric fpcs lcc \(TX Matrix Router with 3D SIBs\) on page 1445](#)  
[show chassis fabric fpcs \(TI600 Router\) on page 1446](#)  
[show chassis fabric fpcs \(T4000 Core Router\) on page 1447](#)  
[show chassis fabric fpcs \(TX Matrix Plus Router\) on page 1448](#)  
[show chassis fabric fpcs lcc \(TX Matrix Plus Router\) on page 1456](#)  
[show chassis fabric fpcs \(EX8200 Switch\) on page 1457](#)  
[show chassis fabric fpcs \(EX9253 Switch\) on page 1458](#)  
[show chassis fabric fpcs \(EX9253 Switch\) on page 1460](#)  
[show chassis fabric fpcs \(PTX3000 Router\) on page 1463](#)  
[show chassis fabric fpcs \(PTX10008 Router\) on page 1463](#)  
[show chassis fabric fpcs \(PTX10016 Router\) on page 1465](#)  
[show chassis fabric fpcs \(QFX10008 Switch\) on page 1467](#)



**Output Fields** Table 124 on page 1415 lists the output fields for the **show chassis fabric fpcs** command. Output fields are listed in the approximate order in which they appear.

*Table 124: show chassis fabric fpcs Output Fields*

Field Name	Field Description
<b>Fabric management FPC state</b>	<p>Switching fabric link (link from SIB to FPC) state for each FPC:</p> <ul style="list-style-type: none"> <li>• <b>Unused</b>—FPC is not present. (On MX240 and MX480 routers with AS- MLC modular carrier card or MPC4E only) the fabric plane from the pair that share physical links (1 and 5, and 3 and 7) is inactive.</li> <li>• <b>Destination error on PFEs list of PFE numbers</b>—Destination errors to the listed Packet Forwarding Engines. Indicates that the link is not carrying traffic to the listed Packet Forwarding Engines.  <b>NOTE:</b> In Junos OS Release 9.6 and later, the list of Packet Forwarding Engines with destination errors is displayed in the output.  In Junos OS Releases before 9.6, the output only indicates that there are destination errors. However, the list of Packet Forwarding Engines with destination errors is not displayed.</li> <li>• <b>Links ok</b>—Link between the spare SIB and FPC is eligible to carry traffic.</li> <li>• <b>Link error</b>—Link between the SIB and FPC has CRC errors. However, the link is still eligible to carry traffic.</li> <li>• <b>Plane disabled</b>—Fabric plane has been disabled for the following reasons: <ul style="list-style-type: none"> <li>• Destination errors have exceeded the thresholds.</li> <li>• Run-time link errors have exceeded the thresholds.</li> <li>• Initialization time link errors detected, and link training was unsuccessful.</li> <li>• <b>Plane Disabled, Links Error</b> (PTX Series Packet Transport Routers and QFX Series switches only)—The plane is disabled because of link errors detected at the FPC RX.</li> </ul> </li> <li>• <b>Plane Disabled, Links Down</b> (PTX Series Packet Transport Routers and QFX Series switches only)—The plane is disabled because of link errors detected at the SIB RX.</li> <li>• <b>Plane enabled</b>—Link between the active SIB and FPC is eligible to carry traffic.  <b>NOTE:</b> On the Enhanced MX SCB with MPC, a maximum of 4 planes are operational and running. On all the other SCBs with MPC, all the planes are operational and running.</li> <li>• <b>Plane Enabled, Links OK</b> (PTX Series Packet Transport Routers and QFX Series switches only)—The FPC CCL RX link is eligible to carry traffic.</li> <li>• <b>Plane Enabled, Links OK</b> (TX Matrix and TX Matrix Plus routers only)—The FPC HSL RX link is eligible to carry traffic.</li> </ul>

## Sample Output

### show chassis fabric fpcs (M320 Router)

```
user@host> show chassis fabric fpcs
```

```
Fabric management FPC state:
```

```
FPC #2
```

```
  PFE #1
```

```
    SIB #0
```

```
      Plane enabled
```

```
    SIB #1
```

```
      Plane enabled
```

```
    SIB #2
```

```
      Plane enabled
```

```
    SIB #3
```

```
      Plane enabled
```

### show chassis fabric fpcs (MX240 Router)

```
user@host> show chassis fabric fpcs
```

```
Fabric management FPC state:
```

```
FPC 2
```

```
  PFE #0
```

```
    Plane 0: Plane enabled
```

```
    Plane 1: Plane enabled
```

```
    Plane 2: Plane enabled
```

```
    Plane 3: Plane enabled
```

```
    Plane 4: Links ok
```

```
    Plane 5: Links ok
```

```
    Plane 6: Links ok
```

```
    Plane 7: Links ok
```

```
  PFE #1
```

```
    Plane 0: Plane enabled
```

```
    Plane 1: Plane enabled
```

```
    Plane 2: Plane enabled
```

```
    Plane 3: Plane enabled
```

```
    Plane 4: Links ok
```

```
    Plane 5: Links ok
```

```
    Plane 6: Links ok
```

```
    Plane 7: Links ok
```

```
  PFE #2
```

```
    Plane 0: Plane enabled
```

```
    Plane 1: Plane enabled
```

```
    Plane 2: Plane enabled
```

```
    Plane 3: Plane enabled
```

```
    Plane 4: Links ok
```

```
    Plane 5: Links ok
```

```
    Plane 6: Links ok
```

```
    Plane 7: Links ok
```

```
  PFE #3
```

```
    Plane 0: Plane enabled
```

```
    Plane 1: Plane enabled
```

```
    Plane 2: Plane enabled
```

```
    Plane 3: Plane enabled
```

```
    Plane 4: Links ok
```

```
    Plane 5: Links ok
```

```
    Plane 6: Links ok
```

```
    Plane 7: Links ok
```

## show chassis fabric fpcs (MX10008 Router)

```
user@host> show chassis fabric fpcs
```

```
Fabric management FPC state:
```

```
FPC 1
```

```
  PFE #0
```

```
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Unused
    Plane 5: Unused
```

```
  PFE #1
```

```
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Unused
    Plane 5: Unused
```

```
  PFE #2
```

```
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Unused
    Plane 5: Unused
```

```
  PFE #3
```

```
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Unused
    Plane 5: Unused
```

```
  PFE #4
```

```
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Unused
    Plane 5: Unused
```

```
  PFE #5
```

```
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Unused
    Plane 5: Unused
```

```
FPC 5
```

```
  PFE #0
```

```
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Unused
    Plane 5: Unused
```

```
  PFE #1
```

```
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
```

```
Plane 3: Plane enabled
Plane 4: Unused
Plane 5: Unused
PFE #2
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Unused
Plane 5: Unused
PFE #3
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Unused
Plane 5: Unused
PFE #4
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Unused
Plane 5: Unused
PFE #5
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Unused
Plane 5: Unused
```

### show chassis fabric fpcs (MX480 Router)

```
user@host> show chassis fabric fpcs
```

```
FPC 0
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Links ok
Plane 5: Links ok
Plane 6: Links ok
Plane 7: Links ok
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Links ok
Plane 5: Links ok
Plane 6: Links ok
Plane 7: Links ok
PFE #2
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
```

```

Plane 3: Plane enabled
Plane 4: Links ok
Plane 5: Links ok
Plane 6: Links ok
Plane 7: Links ok
PFE #3
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Links ok
Plane 5: Links ok
Plane 6: Links ok
Plane 7: Links ok
FPC 1
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled

```

### show chassis fabric fpcs (MX960 Router)

```
user@host> show chassis fabric fpcs
```

```

FPC 0
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Links ok
Plane 5: Links ok
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Links ok
Plane 5: Links ok
PFE #2
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Links ok
Plane 5: Links ok

```

```

PFE #3
  Plane 0: Plane enabled
  Plane 1: Plane enabled
  Plane 2: Plane enabled
  Plane 3: Plane enabled
  Plane 4: Links ok
  Plane 5: Links ok
FPC 1
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
FPC 2
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
  PFE #2
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
...

```

### show chassis fabric fpcs (MX240 with AS MLC Modular Carrier Card)

In the following output, FPC 1 is the AS MLC modular carrier card (AS MCC).

```
user@host>show chassis fabric fpcs
```

```

FPC 1
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Unused
    Plane 6: Plane enabled

```

```

        Plane 7: Unused
FPC 2
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled

```

### show chassis fabric fpcs (MX480 with AS MLC Modular Carrier Card)

In the following output, FPC 5 is the AS MLC modular carrier card (AS MCC).

```
user@host>show chassis fabric fpcs
```

```

FPC 2
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
FPC 4
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
    Plane 6: Links ok
    Plane 7: Links ok
  PFE #2
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
    Plane 6: Links ok
    Plane 7: Links ok
FPC 5
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Unused
    Plane 6: Plane enabled
    Plane 7: Unused

```

### show chassis fabric fpcs (MX480 Router with MPC4E)

In the following output, **FPC4** is the MPC4E (MPC4E-3D-32XGE-SFPP) card.

```
user@host > show chassis fabric fpcs
```

```
Fabric management FPC state:
```

```
FPC 0
```

```
  PFE #0
```

```
    Plane 0: Links ok
    Plane 1: Links ok
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Links ok
    Plane 6: Plane enabled
    Plane 7: Links ok
```

```
  PFE #1
```

```
    Plane 0: Links ok
    Plane 1: Links ok
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Links ok
    Plane 6: Plane enabled
    Plane 7: Links ok
```

```
FPC 1
```

```
  PFE #0
```

```
    Plane 0: Links ok
    Plane 1: Links ok
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Links ok
    Plane 6: Plane enabled
    Plane 7: Links ok
```

```
  PFE #1
```

```
    Plane 0: Links ok
    Plane 1: Links ok
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Links ok
    Plane 6: Plane enabled
    Plane 7: Links ok
```

```
  PFE #2
```

```
    Plane 0: Links ok
    Plane 1: Links ok
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Links ok
    Plane 6: Plane enabled
    Plane 7: Links ok
```

```
  PFE #3
```

```
    Plane 0: Links ok
    Plane 1: Links ok
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Links ok
```



```

        Plane 6: Plane enabled
FPC 3
  PFE #0
    Plane 0: Links ok
    Plane 1: Links ok
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Links ok
    Plane 6: Plane enabled
    Plane 7: Links ok
FPC 4
  PFE #0
    Plane 0: Links ok
    Plane 1: Links ok
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Unused
    Plane 6: Plane enabled
    Plane 7: Unused
  PFE #1
    Plane 0: Links ok
    Plane 1: Links ok
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Unused
    Plane 6: Plane enabled
    Plane 7: Unused

```

### show chassis fabric fpcs (MX960 with AS MLC Modular Carrier Card)

In the following output, FPC 5 is the AS MLC modular carrier card (AS MCC).

```
user@host>show chassis fabric fpcs
```

```

Fabric management FPC state:
FPC 0
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
FPC 1
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled

```

```
Plane 4: Links ok
Plane 5: Links ok
FPC 4
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
  PFE #2
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
  PFE #3
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
FPC 5
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
FPC 8
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
  PFE #2
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
```

```

    Plane 5: Links ok
PFE #3
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok

```

### show chassis fabric fpcs (MX2010 Router)

```
user@host> show chassis fabric fpcs
```

```
Fabric management FPC state:
```

```
FPC 0
```

```
  PFE #0
```

```

    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled

```

```
  PFE #1
```

```

    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled

```

```
FPC 1
```

```
  PFE #0
```

```

    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled

```

```
FPC 2
```

```
  PFE #0
```

```

    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled

```

```
  PFE #1
```

```

    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled

```

```
        Plane 6: Plane enabled
        Plane 7: Plane enabled
FPC 3
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #2
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #3
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
FPC 4
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
FPC 5
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #1
```

```

    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
FPC 6
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #2
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #3
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
FPC 7
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane disabled

```

```
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
FPC 8
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane disabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
FPC 9
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane disabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane disabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
```

### show chassis fabric fpcs (MX2020 Router)

```
user@host> show chassis fabric fpcs
```

```
Fabric management FPC state:
FPC 0
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #2
Plane 0: Plane enabled
```

```
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #3
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
FPC 1
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #2
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #3
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
FPC 2
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
```

```
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #2
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #3
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
FPC 3
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #2
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #3
Plane 0: Plane enabled
```



```

Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
FPC 4
...
```

### show chassis fabric fpcs (MX2020 Router with MPC4E)

```
user@host > show chassis fabric fpcs
```

```

Fabric management FPC state:
FPC 0
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
FPC 9
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
FPC 10
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
```

```
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
FPC 14
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
FPC 19
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #2
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
PFE #3
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
```

## show chassis fabric fpcs (MX2020 Router with SFB2)

```
user@host> show chassis fabric fpcs extended
```

```
Fabric management FPC state:
```

```
FPC 0
```

```
  PFE #0
```

```
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Destination error
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
    Plane 8: Destination error
    Plane 9: Destination error
    Plane 10: Destination error
    Plane 11: Destination error
    Plane 12: Plane enabled
    Plane 13: Plane enabled
    Plane 14: Plane enabled
    Plane 15: Plane enabled
    Plane 16: Plane enabled
    Plane 17: Plane enabled
    Plane 18: Plane disabled
    Plane 19: Plane disabled
    Plane 20: Plane disabled
    Plane 21: Destination error
    Plane 22: Plane enabled
    Plane 23: Plane enabled
```

```
FPC 1
```

```
  PFE #0
```

```
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane enabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane enabled
    Plane 8: Plane enabled
    Plane 9: Plane enabled
    Plane 10: Plane enabled
    Plane 11: Plane enabled
    Plane 12: Plane enabled
    Plane 13: Plane enabled
    Plane 14: Plane enabled
    Plane 15: Plane enabled
    Plane 16: Plane enabled
    Plane 17: Plane enabled
    Plane 18: Plane disabled
    Plane 19: Plane disabled
    Plane 20: Plane disabled
    Plane 21: Plane enabled
    Plane 22: Plane enabled
    Plane 23: Plane enabled
```

```
  PFE #1
```

```
    Plane 0: Plane enabled
    Plane 1: Plane enabled
```

```
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
Plane 12: Plane enabled
Plane 13: Plane enabled
Plane 14: Plane enabled
Plane 15: Plane enabled
Plane 16: Plane enabled
Plane 17: Plane enabled
Plane 18: Plane disabled
Plane 19: Plane disabled
Plane 20: Plane disabled
Plane 21: Plane enabled
Plane 22: Plane enabled
Plane 23: Plane enabled
```

PFE #2

```
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
Plane 12: Plane enabled
Plane 13: Plane enabled
Plane 14: Plane enabled
Plane 15: Plane enabled
Plane 16: Plane enabled
Plane 17: Plane enabled
Plane 18: Plane disabled
Plane 19: Plane disabled
Plane 20: Plane disabled
Plane 21: Plane enabled
Plane 22: Plane enabled
Plane 23: Plane enabled
```

PFE #3

```
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
```

```
Plane 12: Plane enabled
Plane 13: Plane enabled
Plane 14: Plane enabled
Plane 15: Plane enabled
Plane 16: Plane enabled
Plane 17: Plane enabled
Plane 18: Plane disabled
Plane 19: Plane disabled
Plane 20: Plane disabled
Plane 21: Plane enabled
Plane 22: Plane enabled
Plane 23: Plane enabled
```

...

#### FPC 19

##### PFE #0

```
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
Plane 12: Plane enabled
Plane 13: Plane enabled
Plane 14: Plane enabled
Plane 15: Plane enabled
Plane 16: Plane enabled
Plane 17: Plane enabled
Plane 18: Unused
Plane 19: Unused
Plane 20: Unused
Plane 21: Plane enabled
Plane 22: Plane enabled
Plane 23: Plane enabled
```

##### PFE #1

```
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
Plane 12: Plane enabled
Plane 13: Plane enabled
Plane 14: Plane enabled
Plane 15: Plane enabled
Plane 16: Plane enabled
Plane 17: Plane enabled
Plane 18: Unused
```

```
Plane 19: Unused
Plane 20: Unused
Plane 21: Plane enabled
Plane 22: Plane enabled
Plane 23: Plane enabled
PFE #2
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
Plane 12: Plane enabled
Plane 13: Plane enabled
Plane 14: Plane enabled
Plane 15: Plane enabled
Plane 16: Plane enabled
Plane 17: Plane enabled
Plane 18: Unused
Plane 19: Unused
Plane 20: Unused
Plane 21: Plane enabled
Plane 22: Plane enabled
Plane 23: Plane enabled
PFE #3
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
Plane 12: Plane enabled
Plane 13: Plane enabled
Plane 14: Plane enabled
Plane 15: Plane enabled
Plane 16: Plane enabled
Plane 17: Plane enabled
Plane 18: Unused
Plane 19: Unused
Plane 20: Unused
Plane 21: Plane enabled
Plane 22: Plane enabled
Plane 23: Plane enabled
```

### show chassis fabric fpcs (MX2008 Router)

```
user@host> show chassis fabric fpcs
```

```
Fabric management FPC state:
FPC 0
  PFE #0
    Plane 0: Plane disabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane disabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane disabled
  PFE #1
    Plane 0: Plane disabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane disabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane disabled
  PFE #2
    Plane 0: Plane disabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane disabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane disabled
  PFE #3
    Plane 0: Plane disabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane disabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane disabled
FPC 1
  PFE #0
    Plane 0: Plane disabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane disabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane disabled
  PFE #1
    Plane 0: Plane disabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Plane disabled
    Plane 5: Plane enabled
    Plane 6: Plane enabled
    Plane 7: Plane disabled
  PFE #2
    Plane 0: Plane disabled
    Plane 1: Plane enabled
```

```
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane disabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane disabled
PFE #3
Plane 0: Plane disabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane disabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane disabled
FPC 3
PFE #0
Plane 0: Plane disabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane disabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane disabled
FPC 5
PFE #0
Plane 0: Plane disabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane disabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane disabled
```

### show chassis fabric fpcs (MX10003 Router)

```
user@host> show chassis fabric fpcs
```

```
Fabric management FPC state:
FPC 1
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
Plane 12: Plane enabled
Plane 13: Plane enabled
Plane 14: Plane enabled
Plane 15: Plane enabled
```



```

Plane 16: Plane enabled
Plane 17: Plane enabled
Plane 18: Plane enabled
Plane 19: Plane enabled
Plane 20: Plane enabled
Plane 21: Plane enabled
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
Plane 12: Plane enabled
Plane 13: Plane enabled
Plane 14: Plane enabled
Plane 15: Plane enabled
Plane 16: Plane enabled
Plane 17: Plane enabled
Plane 18: Plane enabled
Plane 19: Plane enabled
Plane 20: Plane enabled
Plane 21: Plane enabled
PFE #2
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
Plane 12: Plane enabled
Plane 13: Plane enabled
Plane 14: Plane enabled
Plane 15: Plane enabled
Plane 16: Plane enabled
Plane 17: Plane enabled
Plane 18: Plane enabled
Plane 19: Plane enabled
Plane 20: Plane enabled
Plane 21: Plane enabled

```

### show chassis fabric fpcs (T320 Router)

```

user@host> show chassis fabric fpcs

FPC #3
  PFE #1
    SIB #0

```

```

        Links ok
    SIB #1
        Plane enabled
    SIB #2
        Plane enabled
FPC #5
    PFE #1
        SIB #0
            Links ok
        SIB #1
            Plane enabled
        SIB #2
            Plane enabled
FPC #7
    PFE #1
        SIB #0
            Links ok
        SIB #1
            Plane enabled
        SIB #2
            Plane enabled

```

#### show chassis fabric fpcs (T640 Router)

```
user@host> show chassis fabric fpcs
```

```
Fabric management FPC state:
```

```

FPC #2
  PFE #1
    SIB #0
        Links ok
    SIB #1
        Plane enabled
    SIB #2
        Plane enabled
    SIB #3
        Plane enabled
    SIB #4
        Plane enabled
FPC #3
  PFE #1
    SIB #2
        Plane enabled
    SIB #3
        Link error
        Destination error on PFes
        8   9  10  11  12  13  14  15  16  17  18  19  20  21
    SIB #4
        Destination error on PFes
        8   9  10  11  12  13  14  15  16  17  18  19  20  21
...

```

#### show chassis fabric fpcs (TX Matrix Router)

```
user@host> show chassis fabric fpcs
```

```
1cc0-re0:
```

```

Fabric management FPC state:
FPC #0
  PFE #1
    SIB #0
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
FPC #2
  PFE #1
    SIB #0
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
FPC #3
  PFE #1
    SIB #2
      Plane enabled
    SIB #3
      Link error
      Destination error on PFES
      8   9   10  11  12  13  14  15  16  17  18  19  20  21
    SIB #4
      Destination error on PFES
      8   9   10  11  12  13  14  15  16  17  18  19  20  21
...
FPC #4
  PFE #0
    SIB #4 Links ok
  PFE #1
    SIB #4 Links ok
FPC #5
  PFE #1
    SIB #4 Links ok
FPC #6
  PFE #1
    SIB #4 Links ok

lcc2-re0:
-----
Fabric management FPC state:
FPC #0
  PFE #1
    SIB #4 Links ok
FPC #1
  PFE #1
    SIB #4 Links ok
FPC #2
  PFE #0
    SIB #4 Links ok
  PFE #1
    SIB #4 Links ok
FPC #4
  PFE #0

```

```
SIB #4 Links ok
PFE #1
SIB #4 Links ok
FPC #5
PFE #1
SIB #4 Links ok
```

### show chassis fabric fpcs (TX Matrix Router with 3D SIBs)

```
user@host> show chassis fabric fpcs
```

```
1cc0-re0:
```

```
-----
Fabric management FPC state:
```

```
FPC #0
```

```
PFE #0
```

```
SIB #0
```

```
Links ok
```

```
SIB #1
```

```
Links ok
```

```
SIB #2
```

```
Links ok
```

```
SIB #3
```

```
Links ok
```

```
SIB #4
```

```
Links ok
```

```
PFE #1
```

```
SIB #0
```

```
Links ok
```

```
SIB #1
```

```
Links ok
```

```
SIB #2
```

```
Links ok
```

```
SIB #3
```

```
Links ok
```

```
SIB #4
```

```
Links ok
```

```
FPC #3
```

```
PFE #0
```

```
SIB #0
```

```
Links ok
```

```
SIB #1
```

```
Links ok
```

```
SIB #2
```

```
Links ok
```

```
SIB #3
```

```
Links ok
```

```
SIB #4
```

```
Links ok
```

```
PFE #1
```

```
SIB #0
```

```
Links ok
```

```
SIB #1
```

```
Links ok
```

```
SIB #2
```

```
Links ok
```

```
SIB #3
```

```
Links ok
```

```
SIB #4
```

```
Links ok
```

```
FPC #4
PFE #0
  SIB #0      Links ok
  SIB #1      Links ok
  SIB #2      Links ok
  SIB #3      Links ok
  SIB #4      Links ok
PFE #1
  SIB #0      Links ok
  SIB #1      Links ok
  SIB #2      Links ok
  SIB #3      Links ok
  SIB #4      Links ok
FPC #5
PFE #0
  SIB #0      Links ok
  SIB #1      Links ok
  SIB #2      Links ok
  SIB #3      Links ok
  SIB #4      Links ok
PFE #1
  SIB #0      Links ok
  SIB #1      Links ok
  SIB #2      Links ok
  SIB #3      Links ok
  SIB #4      Links ok
FPC #6
PFE #0
  SIB #0      Links ok
  SIB #1      Links ok
  SIB #2      Links ok
  SIB #3      Links ok
  SIB #4      Links ok
PFE #1
  SIB #0
```

```

        Links ok
    SIB #1
        Links ok
    SIB #2
        Links ok
    SIB #3
        Links ok
    SIB #4
        Links ok

lcc2-re0:
-----

lcc4-re0:
-----

Fabric management FPC state:
FPC #2
  PFE #0
    SIB #0
        Links ok
    SIB #1
        Links ok
    SIB #2
        Links ok
    SIB #3
        Links ok
    SIB #4
        Links ok
  PFE #1
    SIB #0
        Links ok
    SIB #1
        Links ok
    SIB #2
        Links ok
    SIB #3
        Links ok
    SIB #4
        Links ok
FPC #3
  PFE #0
    SIB #0
        Links ok
    SIB #1
        Links ok
    SIB #2
        Links ok
    SIB #3
        Links ok
    SIB #4
        Links ok
  PFE #1
    SIB #0
        Links ok
    SIB #1
        Links ok
    SIB #2
        Links ok
    SIB #3
        Links ok
```

```
SIB #4
    Links ok
```

```
lcc6-re0:
-----
```

### show chassis fabric fpcs lcc (TX Matrix Router with 3D SIBs)

```
user@host> show chassis fabric fpcs lcc 4
```

```
lcc4-re0:
-----
```

```
Fabric management FPC state:
```

```
FPC #2
```

```
PFE #0
```

```
SIB #0
    Links ok
```

```
SIB #1
    Links ok
```

```
SIB #2
    Links ok
```

```
SIB #3
    Links ok
```

```
SIB #4
    Links ok
```

```
PFE #1
```

```
SIB #0
    Links ok
```

```
SIB #1
    Links ok
```

```
SIB #2
    Links ok
```

```
SIB #3
    Links ok
```

```
SIB #4
    Links ok
```

```
FPC #3
```

```
PFE #0
```

```
SIB #0
    Links ok
```

```
SIB #1
    Links ok
```

```
SIB #2
    Links ok
```

```
SIB #3
    Links ok
```

```
SIB #4
    Links ok
```

```
PFE #1
```

```
SIB #0
    Links ok
```

```
SIB #1
    Links ok
```

```
SIB #2
    Links ok
```

```
SIB #3
    Links ok
```

```
SIB #4
    Links ok
```

**show chassis fabric fpcs (TI600 Router)**

```
user@host> show chassis fabric fpcs
```

```
Fabric management FPC state:
```

```
FPC #0
```

```
  PFE #0
```

```
    SIB #0
```

```
      Links ok
```

```
    SIB #1
```

```
      Plane enabled
```

```
    SIB #2
```

```
      Plane enabled
```

```
    SIB #3
```

```
      Plane enabled
```

```
    SIB #4
```

```
      Plane enabled
```

```
  PFE #1
```

```
    SIB #0
```

```
      Links ok
```

```
    SIB #1
```

```
      Plane enabled
```

```
    SIB #2
```

```
      Plane enabled
```

```
    SIB #3
```

```
      Plane enabled
```

```
    SIB #4
```

```
      Plane enabled
```

```
FPC #1
```

```
  PFE #0
```

```
    SIB #0
```

```
      Links ok
```

```
    SIB #1
```

```
      Plane enabled
```

```
    SIB #2
```

```
      Plane enabled
```

```
    SIB #3
```

```
      Plane enabled
```

```
    SIB #4
```

```
      Plane enabled
```

```
  PFE #1
```

```
    SIB #0
```

```
      Links ok
```

```
    SIB #1
```

```
      Plane enabled
```

```
    SIB #2
```

```
      Plane enabled
```

```
    SIB #3
```

```
      Plane enabled
```

```
    SIB #4
```

```
      Plane enabled
```

```
FPC #2
```

```
  PFE #0
```

```
    SIB #0
```

```
      Links ok
```

```
    SIB #1
```

```
      Plane enabled
```

```
    SIB #2
```

```
      Plane enabled
```

```
    SIB #3
```



```

        Plane enabled
      SIB #4
        Plane enabled
FPC #4
  PFE #0
    SIB #0
      Links ok
    SIB #1
      Plane enabled
    SIB #2
      Plane enabled
    SIB #3
      Plane enabled
    SIB #4
      Plane enabled
  PFE #1
    SIB #0
      Links ok
    SIB #1
      Plane enabled
    SIB #2
      Plane enabled
    SIB #3
      Plane enabled
    SIB #4
      Plane enabled
FPC #3
  PFE #1
    SIB #2
      Plane enabled
    SIB #3
      Link error
      Destination error on PFES      0   1   2   3   4   5   6   7
      8   9  10  11  12  13  14  15  16  17  18  19  20  21
    SIB #4
      Destination error on PFES      0   1   2   3   4   5   6   7
      8   9  10  11  12  13  14  15  16  17  18  19  20  21

```

#### show chassis fabric fpcs (T4000 Core Router)

```

Fabric management FPC state:
FPC #2
  PFE #0
    SIB #0
      Links ok
    SIB #1
      Plane enabled
    SIB #2
      Plane enabled
    SIB #3
      Plane enabled
    SIB #4
      Plane enabled
FPC #3
  PFE #0
    SIB #0
      Links ok
    SIB #1
      Plane enabled

```

```

    SIB #2      Plane enabled
    SIB #3      Plane enabled
    SIB #4      Plane enabled
FPC #5
  PFE #0
    SIB #0      Links ok
    SIB #1      Plane enabled
    SIB #2      Plane enabled
    SIB #3      Plane enabled
    SIB #4      Plane enabled
  PFE #1
    SIB #0      Links ok
    SIB #1      Plane enabled
    SIB #2      Plane enabled
    SIB #3      Plane enabled
    SIB #4      Plane enabled
FPC #6
  PFE #0
    SIB #0      Links ok
    SIB #1      Plane enabled
    SIB #2      Plane enabled
    SIB #3      Plane enabled
    SIB #4      Plane enabled
  PFE #1
    SIB #0      Links ok
    SIB #1      Plane enabled
    SIB #2      Plane enabled
    SIB #3      Plane enabled
    SIB #4      Plane enabled

```

### show chassis fabric fpcs (TX Matrix Plus Router)

```
user@host> show chassis fabric fpcs
```

```
lcc0-re0:
```

```
-----
Fabric management FPC state:
```

```

FPC #0
  PFE #1
    SIB #0
      Unused
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
FPC #2
  PFE #0
    SIB #0
      Unused
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
  PFE #1
    SIB #0
      Unused
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
FPC #3
  PFE #1
    SIB #2
      Plane enabled
    SIB #3
      Link error
      Destination error on PFES
      8   9  10  11  12  13  14  15  16  17  18  19  20  21
    SIB #4
      Destination error on PFES
      8   9  10  11  12  13  14  15  16  17  18  19  20  21
FPC #4
  PFE #0
    SIB #0
      Unused
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
  PFE #1
    SIB #0

```

```

        SIB #1      Unused
        SIB #2      Links ok
        SIB #3      Links ok
        SIB #4      Links ok
FPC #6
  PFE #0
    SIB #0      Unused
    SIB #1      Links ok
    SIB #2      Links ok
    SIB #3      Links ok
    SIB #4      Links ok
  PFE #1
    SIB #0      Unused
    SIB #1      Links ok
    SIB #2      Links ok
    SIB #3      Links ok
    SIB #4      Links ok
FPC #7
  PFE #0
    SIB #0      Unused
    SIB #1      Links ok
    SIB #2      Links ok
    SIB #3      Links ok
    SIB #4      Links ok
```

lcc1-re0:

-----  
Fabric management FPC state:

```
FPC #2
  PFE #0
    SIB #0      Links ok
    SIB #1      Links ok
    SIB #2      Links ok
    SIB #3      Links ok
    SIB #4      Links ok
```

```

PFE #1
  SIB #0
    Links ok
  SIB #1
    Links ok
  SIB #2
    Links ok
  SIB #3
    Links ok
  SIB #4
    Links ok
FPC #4
  PFE #0
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
  PFE #1
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Destination error on PFEs      1      8      9      29      40      65      72      73
                                     93 104
    SIB #4
      Links ok
FPC #6
  PFE #0
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
  PFE #1
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
FPC #7

```

```
PFE #0
  SIB #0      Links ok
  SIB #1      Links ok
  SIB #2      Links ok
  SIB #3      Links ok
  SIB #4      Links ok
```

lcc2-re0:

-----  
Fabric management FPC state:

FPC #0

```
PFE #0
  SIB #0      Links ok
  SIB #1      Links ok
  SIB #2      Links ok
  SIB #3      Links ok
  SIB #4      Links ok
```

PFE #1

```
  SIB #0      Links ok
  SIB #1      Links ok
  SIB #2      Links ok
  SIB #3      Links ok
  SIB #4      Links ok
```

FPC #2

```
PFE #0
  SIB #0      Links ok
  SIB #1      Links ok
  SIB #2      Links ok
  SIB #3      Links ok
  SIB #4      Links ok
```

PFE #1

```
  SIB #0      Links ok
  SIB #1      Links ok
  SIB #2      Links ok
  SIB #3      Links ok
  SIB #4
```

```
Links ok
FPC #4
  PFE #0
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
FPC #5
  PFE #0
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
  PFE #1
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
FPC #6
  PFE #0
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
  PFE #1
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
FPC #7
```

```
PFE #0
  SIB #0      Links ok
  SIB #1      Links ok
  SIB #2      Links ok
  SIB #3      Links ok
  SIB #4      Links ok

lcc3-re0:
-----
Fabric management FPC state:
FPC #0
  PFE #0
    SIB #0      Links ok
    SIB #1      Links ok
    SIB #2      Links ok
    SIB #3      Links ok
    SIB #4      Links ok
  PFE #1
    SIB #0      Links ok
    SIB #1      Links ok
    SIB #2      Links ok
    SIB #3      Links ok
    SIB #4      Links ok
FPC #2
  PFE #0
    SIB #0      Links ok
    SIB #1      Links ok
    SIB #2      Links ok
    SIB #3      Links ok
    SIB #4      Links ok
  PFE #1
    SIB #0      Links ok
    SIB #1      Links ok
    SIB #2      Links ok
    SIB #3      Links ok
    SIB #4
```



```
Links ok
FPC #4
  PFE #0
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
  PFE #1
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
FPC #5
  PFE #0
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
  PFE #1
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
FPC #6
  PFE #0
    SIB #0
      Links ok
    SIB #1
      Links ok
    SIB #2
      Links ok
    SIB #3
      Links ok
    SIB #4
      Links ok
  PFE #1
```

```

SIB #0
    Links ok
SIB #1
    Links ok
SIB #2
    Links ok
SIB #3
    Links ok
SIB #4
    Links ok
FPC #7
PFE #0
SIB #0
    Links ok
SIB #1
    Links ok
SIB #2
    Links ok
SIB #3
    Links ok
SIB #4
    Links ok

```

#### show chassis fabric fpcs lcc (TX Matrix Plus Router)

```
user@host> show chassis fabric fpcs lcc 0
```

```
lcc0-re1:
```

```
-----
Fabric management FPC state:
```

```
FPC #3
```

```
PFE #1
```

```
SIB #2
```

```
Plane enabled
```

```
SIB #3
```

```
Link error
```

Destination error on PFEs													
	0	1	2	3	4	5	6	7					
8	9	10	11	12	13	14	15	16	17	18	19	20	21

```
SIB #4
```

Destination error on PFEs													
	0	1	2	3	4	5	6	7					
8	9	10	11	12	13	14	15	16	17	18	19	20	21

```
FPC #4
```

```
PFE #0
```

```
SIB #0 Links ok
```

```
SIB #1 Links ok
```

```
SIB #2 Links ok
```

```
SIB #3 Links ok
```

```
SIB #4 Links ok
```

```
PFE #1
```

```
SIB #0 Links ok
```

```
SIB #1 Links ok
```

```
SIB #2 Links ok
```

```
SIB #3 Links ok
```

```
SIB #4 Links ok
```

```
FPC #6
```

```
PFE #0
```

```
SIB #0 Links ok
```

```
SIB #1 Links ok
```

```
SIB #2 Links ok
```

```
SIB #3 Links ok
```

```

    SIB #4 Links ok
PFE #1
    SIB #0 Links ok
    SIB #1 Links ok
    SIB #2 Links ok
    SIB #3 Links ok
    SIB #4 Links ok
FPC #7
PFE #0
    SIB #0 Links ok
    SIB #1 Links ok
    SIB #2 Links ok
    SIB #3 Links ok
    SIB #4 Links ok

```

### show chassis fabric fpcs (EX8200 Switch)

```
user@host> show chassis fabric fpcs
```

```

Fabric management FPC state
FPC 6
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
    Plane 6: Links ok
    Plane 7: Links ok
    Plane 8: Plane enabled
    Plane 9: Plane enabled
    Plane 10: Plane enabled
    Plane 11: Plane enabled
  PFE #1
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
    Plane 6: Links ok
    Plane 7: Links ok
    Plane 8: Plane enabled
    Plane 9: Plane enabled
    Plane 10: Plane enabled
    Plane 11: Plane enabled
FPC 7
  PFE #0
    Plane 0: Plane enabled
    Plane 1: Plane enabled
    Plane 2: Plane enabled
    Plane 3: Plane enabled
    Plane 4: Links ok
    Plane 5: Links ok
    Plane 6: Links ok
    Plane 7: Links ok
    Plane 8: Plane enabled
    Plane 9: Plane enabled
    Plane 10: Plane enabled

```

```
Plane 11: Plane enabled
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Links ok
Plane 5: Links ok
Plane 6: Links ok
Plane 7: Links ok
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
```

### show chassis fabric fpcs (EX9253 Switch)

```
user@switch> show chassis fabric fpcs
```

```
Fabric management FPC state:
```

```
FPC 0
```

```
PFE #0
```

```
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
Plane 12: Plane enabled
Plane 13: Plane enabled
Plane 14: Plane enabled
Plane 15: Plane enabled
Plane 16: Plane enabled
Plane 17: Plane enabled
Plane 18: Plane enabled
Plane 19: Plane enabled
Plane 20: Plane enabled
Plane 21: Plane enabled
```

```
PFE #1
```

```
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
Plane 12: Plane enabled
Plane 13: Plane enabled
Plane 14: Plane enabled
```

```
Plane 15: Plane enabled
Plane 16: Plane enabled
Plane 17: Plane enabled
Plane 18: Plane enabled
Plane 19: Plane enabled
Plane 20: Plane enabled
Plane 21: Plane enabled
PFE #2
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
Plane 12: Plane enabled
Plane 13: Plane enabled
Plane 14: Plane enabled
Plane 15: Plane enabled
Plane 16: Plane enabled
Plane 17: Plane enabled
Plane 18: Plane enabled
Plane 19: Plane enabled
Plane 20: Plane enabled
Plane 21: Plane enabled
FPC 1
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
Plane 12: Plane enabled
Plane 13: Plane enabled
Plane 14: Plane enabled
Plane 15: Plane enabled
Plane 16: Plane enabled
Plane 17: Plane enabled
Plane 18: Plane enabled
Plane 19: Plane enabled
Plane 20: Plane enabled
Plane 21: Plane enabled
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
```

```
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
Plane 12: Plane enabled
Plane 13: Plane enabled
Plane 14: Plane enabled
Plane 15: Plane enabled
Plane 16: Plane enabled
Plane 17: Plane enabled
Plane 18: Plane enabled
Plane 19: Plane enabled
Plane 20: Plane enabled
Plane 21: Plane enabled
PFE #2
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
Plane 12: Plane enabled
Plane 13: Plane enabled
Plane 14: Plane enabled
Plane 15: Plane enabled
Plane 16: Plane enabled
Plane 17: Plane enabled
Plane 18: Plane enabled
Plane 19: Plane enabled
Plane 20: Plane enabled
Plane 21: Plane enabled
```

### show chassis fabric fpcs (EX9253 Switch)

```
user@switch> show chassis fabric fpcs
```

```
Fabric management FPC state:
```

```
FPC 0
```

```
PFE #0
```

```
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
```

```
Plane 12: Plane enabled
Plane 13: Plane enabled
Plane 14: Plane enabled
Plane 15: Plane enabled
Plane 16: Plane enabled
Plane 17: Plane enabled
Plane 18: Plane enabled
Plane 19: Plane enabled
Plane 20: Plane enabled
Plane 21: Plane enabled
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
Plane 12: Plane enabled
Plane 13: Plane enabled
Plane 14: Plane enabled
Plane 15: Plane enabled
Plane 16: Plane enabled
Plane 17: Plane enabled
Plane 18: Plane enabled
Plane 19: Plane enabled
Plane 20: Plane enabled
Plane 21: Plane enabled
PFE #2
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
Plane 12: Plane enabled
Plane 13: Plane enabled
Plane 14: Plane enabled
Plane 15: Plane enabled
Plane 16: Plane enabled
Plane 17: Plane enabled
Plane 18: Plane enabled
Plane 19: Plane enabled
Plane 20: Plane enabled
Plane 21: Plane enabled
FPC 1
PFE #0
Plane 0: Plane enabled
Plane 1: Plane enabled
```

```
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
Plane 12: Plane enabled
Plane 13: Plane enabled
Plane 14: Plane enabled
Plane 15: Plane enabled
Plane 16: Plane enabled
Plane 17: Plane enabled
Plane 18: Plane enabled
Plane 19: Plane enabled
Plane 20: Plane enabled
Plane 21: Plane enabled
PFE #1
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
Plane 12: Plane enabled
Plane 13: Plane enabled
Plane 14: Plane enabled
Plane 15: Plane enabled
Plane 16: Plane enabled
Plane 17: Plane enabled
Plane 18: Plane enabled
Plane 19: Plane enabled
Plane 20: Plane enabled
Plane 21: Plane enabled
PFE #2
Plane 0: Plane enabled
Plane 1: Plane enabled
Plane 2: Plane enabled
Plane 3: Plane enabled
Plane 4: Plane enabled
Plane 5: Plane enabled
Plane 6: Plane enabled
Plane 7: Plane enabled
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
Plane 12: Plane enabled
Plane 13: Plane enabled
Plane 14: Plane enabled
Plane 15: Plane enabled
```



```

Plane 16: Plane enabled
Plane 17: Plane enabled
Plane 18: Plane enabled
Plane 19: Plane enabled
Plane 20: Plane enabled
Plane 21: Plane enabled

```

### show chassis fabric fpcs (PTX3000 Router)

```
user@host> show chassis fabric fpcs slot 8
```

```
Fabric management FPC state:
```

```
FPC #8
```

```
PFE #0
```

```

SIB0_Fcore0 (plane 0)  Plane Enabled, Links OK
SIB0_Fcore1 (plane 1)  Plane Enabled, Links OK
SIB1_Fcore0 (plane 2)  Plane Enabled, Links OK
SIB1_Fcore1 (plane 3)  Plane Enabled, Links OK
SIB2_Fcore0 (plane 4)  Plane Enabled, Links OK
SIB2_Fcore1 (plane 5)  Plane Enabled, Links OK
SIB3_Fcore0 (plane 6)  Plane Enabled, Links OK
SIB3_Fcore1 (plane 7)  Plane Enabled, Links OK
SIB4_Fcore0 (plane 8)  Plane Enabled, Links OK
SIB4_Fcore1 (plane 9)  Plane Enabled, Links OK
SIB5_Fcore0 (plane 10) Plane Enabled, Links OK
SIB5_Fcore1 (plane 11) Plane Enabled, Links OK
SIB6_Fcore0 (plane 12) Plane Enabled, Links OK
SIB6_Fcore1 (plane 13) Plane Enabled, Links OK
SIB7_Fcore0 (plane 14) Plane Enabled, Links OK
SIB7_Fcore1 (plane 15) Plane Enabled, Links OK
SIB8_Fcore0 (plane 16) Plane Enabled, Links OK
SIB8_Fcore1 (plane 17) Plane Enabled, Links OK

```

```
PFE #1
```

```

SIB0_Fcore0 (plane 0)  Plane Enabled, Links OK
SIB0_Fcore1 (plane 1)  Plane Enabled, Links OK
SIB1_Fcore0 (plane 2)  Plane Enabled, Links OK
SIB1_Fcore1 (plane 3)  Plane Enabled, Links OK
SIB2_Fcore0 (plane 4)  Plane Enabled, Links OK
SIB2_Fcore1 (plane 5)  Plane Enabled, Links OK
SIB3_Fcore0 (plane 6)  Plane Enabled, Links OK
SIB3_Fcore1 (plane 7)  Plane Enabled, Links OK
SIB4_Fcore0 (plane 8)  Plane Enabled, Links OK
SIB4_Fcore1 (plane 9)  Plane Enabled, Links OK
SIB5_Fcore0 (plane 10) Plane Enabled, Links OK
SIB5_Fcore1 (plane 11) Plane Enabled, Links OK
SIB6_Fcore0 (plane 12) Plane Enabled, Links OK
SIB6_Fcore1 (plane 13) Plane Enabled, Links OK
SIB7_Fcore0 (plane 14) Plane Enabled, Links OK
SIB7_Fcore1 (plane 15) Plane Enabled, Links OK
SIB8_Fcore0 (plane 16) Plane Enabled, Links OK
SIB8_Fcore1 (plane 17) Plane Enabled, Links OK

```

### show chassis fabric fpcs (PTX10008 Router)

```
user@host> show chassis fabric fpcs slot 8
```

```
Fabric management FPC state:
```

```
FPC #0
```

```
PFE #0
```

	SIB0_FASICO	(plane	0)	Plane Enabled, Links OK
	SIB0_FASIC1	(plane	1)	Plane Enabled, Links OK
	SIB1_FASICO	(plane	2)	Plane Enabled, Links OK
	SIB1_FASIC1	(plane	3)	Plane Enabled, Links OK
PFE #1				
	SIB0_FASICO	(plane	0)	Plane Enabled, Links OK
	SIB0_FASIC1	(plane	1)	Plane Enabled, Links OK
	SIB1_FASICO	(plane	2)	Plane Enabled, Links OK
	SIB1_FASIC1	(plane	3)	Plane Enabled, Links OK
PFE #2				
	SIB0_FASICO	(plane	0)	Plane Enabled, Links OK
	SIB0_FASIC1	(plane	1)	Plane Enabled, Links OK
	SIB1_FASICO	(plane	2)	Plane Enabled, Links OK
	SIB1_FASIC1	(plane	3)	Plane Enabled, Links OK
FPC #5				
PFE #0				
	SIB0_FASICO	(plane	0)	Plane Enabled, Links OK
	SIB0_FASIC1	(plane	1)	Plane Enabled, Links OK
	SIB1_FASICO	(plane	2)	Plane Enabled, Links OK
	SIB1_FASIC1	(plane	3)	Plane Enabled, Links OK
PFE #1				
	SIB0_FASICO	(plane	0)	Plane Enabled, Links OK
	SIB0_FASIC1	(plane	1)	Plane Enabled, Links OK
	SIB1_FASICO	(plane	2)	Plane Enabled, Links OK
	SIB1_FASIC1	(plane	3)	Plane Enabled, Links OK
PFE #2				
	SIB0_FASICO	(plane	0)	Plane Enabled, Links OK
	SIB0_FASIC1	(plane	1)	Plane Enabled, Links OK
	SIB1_FASICO	(plane	2)	Plane Enabled, Links OK
	SIB1_FASIC1	(plane	3)	Plane Enabled, Links OK
PFE #3				
	SIB0_FASICO	(plane	0)	Plane Enabled, Links OK
	SIB0_FASIC1	(plane	1)	Plane Enabled, Links OK
	SIB1_FASICO	(plane	2)	Plane Enabled, Links OK
	SIB1_FASIC1	(plane	3)	Plane Enabled, Links OK
PFE #4				
	SIB0_FASICO	(plane	0)	Plane Enabled, Links OK
	SIB0_FASIC1	(plane	1)	Plane Enabled, Links OK
	SIB1_FASICO	(plane	2)	Plane Enabled, Links OK
	SIB1_FASIC1	(plane	3)	Plane Enabled, Links OK
PFE #5				
	SIB0_FASICO	(plane	0)	Plane Enabled, Links OK
	SIB0_FASIC1	(plane	1)	Plane Enabled, Links OK
	SIB1_FASICO	(plane	2)	Plane Enabled, Links OK
	SIB1_FASIC1	(plane	3)	Plane Enabled, Links OK
FPC #6				
PFE #0				
	SIB0_FASICO	(plane	0)	Plane Enabled, Links OK
	SIB0_FASIC1	(plane	1)	Plane Enabled, Links OK
	SIB1_FASICO	(plane	2)	Plane Enabled, Links OK
	SIB1_FASIC1	(plane	3)	Plane Enabled, Links OK
PFE #1				
	SIB0_FASICO	(plane	0)	Plane Enabled, Links OK
	SIB0_FASIC1	(plane	1)	Plane Enabled, Links OK
	SIB1_FASICO	(plane	2)	Plane Enabled, Links OK
	SIB1_FASIC1	(plane	3)	Plane Enabled, Links OK
PFE #2				
	SIB0_FASICO	(plane	0)	Plane Enabled, Links OK
	SIB0_FASIC1	(plane	1)	Plane Enabled, Links OK
	SIB1_FASICO	(plane	2)	Plane Enabled, Links OK

```

SIB1_FASIC1 (plane 3) Plane Enabled, Links OK
PFE #3
SIB0_FASIC0 (plane 0) Plane Enabled, Links OK
SIB0_FASIC1 (plane 1) Plane Enabled, Links OK
SIB1_FASIC0 (plane 2) Plane Enabled, Links OK
SIB1_FASIC1 (plane 3) Plane Enabled, Links OK
PFE #4
SIB0_FASIC0 (plane 0) Plane Enabled, Links OK
SIB0_FASIC1 (plane 1) Plane Enabled, Links OK
SIB1_FASIC0 (plane 2) Plane Enabled, Links OK
SIB1_FASIC1 (plane 3) Plane Enabled, Links OK
PFE #5
SIB0_FASIC0 (plane 0) Plane Enabled, Links OK
SIB0_FASIC1 (plane 1) Plane Enabled, Links OK
SIB1_FASIC0 (plane 2) Plane Enabled, Links OK
SIB1_FASIC1 (plane 3) Plane Enabled, Links OK

```

### show chassis fabric fpcs (PTX10016 Router)

```
user@host> show chassis fabric fpcs slot 8
```

```
Fabric management FPC state:
```

```
FPC #8
```

```
PFE #0
```

```

SIB0_FASIC0 (plane 0) Plane Enabled, Links OK
SIB0_FASIC1 (plane 1) Plane Enabled, Links OK
SIB0_FASIC2 (plane 2) Plane Enabled, Links OK
SIB0_FASIC3 (plane 3) Plane Enabled, Links OK
SIB0_FASIC4 (plane 4) Plane Enabled, Links OK
SIB0_FASIC5 (plane 5) Plane Enabled, Links OK
SIB1_FASIC0 (plane 6) Plane Enabled, Links OK
SIB1_FASIC1 (plane 7) Plane Enabled, Links OK
SIB1_FASIC2 (plane 8) Plane Enabled, Links OK
SIB1_FASIC3 (plane 9) Plane Enabled, Links OK
SIB1_FASIC4 (plane 10) Plane Enabled, Links OK
SIB1_FASIC5 (plane 11) Plane Enabled, Links OK
SIB2_FASIC0 (plane 12) Plane Enabled, Links OK
SIB2_FASIC1 (plane 13) Plane Enabled, Links OK
SIB2_FASIC2 (plane 14) Plane Enabled, Links OK
SIB2_FASIC3 (plane 15) Plane Enabled, Links OK
SIB2_FASIC4 (plane 16) Plane Enabled, Links OK
SIB2_FASIC5 (plane 17) Plane Enabled, Links OK
SIB3_FASIC0 (plane 18) Plane Enabled, Links OK
SIB3_FASIC1 (plane 19) Plane Enabled, Links OK
SIB3_FASIC2 (plane 20) Plane Enabled, Links OK
SIB3_FASIC3 (plane 21) Plane Enabled, Links OK
SIB3_FASIC4 (plane 22) Plane Enabled, Links OK
SIB3_FASIC5 (plane 23) Plane Enabled, Links OK
SIB4_FASIC0 (plane 24) Plane Enabled, Links OK
SIB4_FASIC1 (plane 25) Plane Enabled, Links OK
SIB4_FASIC2 (plane 26) Plane Enabled, Links OK
SIB4_FASIC3 (plane 27) Plane Enabled, Links OK
SIB4_FASIC4 (plane 28) Plane Enabled, Links OK
SIB4_FASIC5 (plane 29) Plane Enabled, Links OK
SIB5_FASIC0 (plane 30) Plane Enabled, Links OK
SIB5_FASIC1 (plane 31) Plane Enabled, Links OK
SIB5_FASIC2 (plane 32) Plane Enabled, Links OK
SIB5_FASIC3 (plane 33) Plane Enabled, Links OK
SIB5_FASIC4 (plane 34) Plane Enabled, Links OK
SIB5_FASIC5 (plane 35) Plane Enabled, Links OK

```

## PFE #1

SIB0_FASIC0	(plane 0)	Plane Enabled, Links OK
SIB0_FASIC1	(plane 1)	Plane Enabled, Links OK
SIB0_FASIC2	(plane 2)	Plane Enabled, Links OK
SIB0_FASIC3	(plane 3)	Plane Enabled, Links OK
SIB0_FASIC4	(plane 4)	Plane Enabled, Links OK
SIB0_FASIC5	(plane 5)	Plane Enabled, Links OK
SIB1_FASIC0	(plane 6)	Plane Enabled, Links OK
SIB1_FASIC1	(plane 7)	Plane Enabled, Links OK
SIB1_FASIC2	(plane 8)	Plane Enabled, Links OK
SIB1_FASIC3	(plane 9)	Plane Enabled, Links OK
SIB1_FASIC4	(plane 10)	Plane Enabled, Links OK
SIB1_FASIC5	(plane 11)	Plane Enabled, Links OK
SIB2_FASIC0	(plane 12)	Plane Enabled, Links OK
SIB2_FASIC1	(plane 13)	Plane Enabled, Links OK
SIB2_FASIC2	(plane 14)	Plane Enabled, Links OK
SIB2_FASIC3	(plane 15)	Plane Enabled, Links OK
SIB2_FASIC4	(plane 16)	Plane Enabled, Links OK
SIB2_FASIC5	(plane 17)	Plane Enabled, Links OK
SIB3_FASIC0	(plane 18)	Plane Enabled, Links OK
SIB3_FASIC1	(plane 19)	Plane Enabled, Links OK
SIB3_FASIC2	(plane 20)	Plane Enabled, Links OK
SIB3_FASIC3	(plane 21)	Plane Enabled, Links OK
SIB3_FASIC4	(plane 22)	Plane Enabled, Links OK
SIB3_FASIC5	(plane 23)	Plane Enabled, Links OK
SIB4_FASIC0	(plane 24)	Plane Enabled, Links OK
SIB4_FASIC1	(plane 25)	Plane Enabled, Links OK
SIB4_FASIC2	(plane 26)	Plane Enabled, Links OK
SIB4_FASIC3	(plane 27)	Plane Enabled, Links OK
SIB4_FASIC4	(plane 28)	Plane Enabled, Links OK
SIB4_FASIC5	(plane 29)	Plane Enabled, Links OK
SIB5_FASIC0	(plane 30)	Plane Enabled, Links OK
SIB5_FASIC1	(plane 31)	Plane Enabled, Links OK
SIB5_FASIC2	(plane 32)	Plane Enabled, Links OK
SIB5_FASIC3	(plane 33)	Plane Enabled, Links OK
SIB5_FASIC4	(plane 34)	Plane Enabled, Links OK
SIB5_FASIC5	(plane 35)	Plane Enabled, Links OK

## PFE #2

SIB0_FASIC0	(plane 0)	Plane Enabled, Links OK
SIB0_FASIC1	(plane 1)	Plane Enabled, Links OK
SIB0_FASIC2	(plane 2)	Plane Enabled, Links OK
SIB0_FASIC3	(plane 3)	Plane Enabled, Links OK
SIB0_FASIC4	(plane 4)	Plane Enabled, Links OK
SIB0_FASIC5	(plane 5)	Plane Enabled, Links OK
SIB1_FASIC0	(plane 6)	Plane Enabled, Links OK
SIB1_FASIC1	(plane 7)	Plane Enabled, Links OK
SIB1_FASIC2	(plane 8)	Plane Enabled, Links OK
SIB1_FASIC3	(plane 9)	Plane Enabled, Links OK
SIB1_FASIC4	(plane 10)	Plane Enabled, Links OK
SIB1_FASIC5	(plane 11)	Plane Enabled, Links OK
SIB2_FASIC0	(plane 12)	Plane Enabled, Links OK
SIB2_FASIC1	(plane 13)	Plane Enabled, Links OK
SIB2_FASIC2	(plane 14)	Plane Enabled, Links OK
SIB2_FASIC3	(plane 15)	Plane Enabled, Links OK
SIB2_FASIC4	(plane 16)	Plane Enabled, Links OK
SIB2_FASIC5	(plane 17)	Plane Enabled, Links OK
SIB3_FASIC0	(plane 18)	Plane Enabled, Links OK
SIB3_FASIC1	(plane 19)	Plane Enabled, Links OK
SIB3_FASIC2	(plane 20)	Plane Enabled, Links OK
SIB3_FASIC3	(plane 21)	Plane Enabled, Links OK

```

SIB3_FASIC4 (plane 22)  Plane Enabled, Links OK
SIB3_FASIC5 (plane 23)  Plane Enabled, Links OK
SIB4_FASIC0 (plane 24)  Plane Enabled, Links OK
SIB4_FASIC1 (plane 25)  Plane Enabled, Links OK
SIB4_FASIC2 (plane 26)  Plane Enabled, Links OK
SIB4_FASIC3 (plane 27)  Plane Enabled, Links OK
SIB4_FASIC4 (plane 28)  Plane Enabled, Links OK
SIB4_FASIC5 (plane 29)  Plane Enabled, Links OK
SIB5_FASIC0 (plane 30)  Plane Enabled, Links OK
SIB5_FASIC1 (plane 31)  Plane Enabled, Links OK
SIB5_FASIC2 (plane 32)  Plane Enabled, Links OK
SIB5_FASIC3 (plane 33)  Plane Enabled, Links OK
SIB5_FASIC4 (plane 34)  Plane Enabled, Links OK
SIB5_FASIC5 (plane 35)  Plane Enabled, Links OK

```

### show chassis fabric fpcs (QFX10008 Switch)

```
user@host> show chassis fabric fpcs slot 0
```

```
Fabric management FPC state:
```

```
FPC #0
```

```
PFE #0
```

```

SIB0_PFO (plane 0)  Plane Enabled, Links OK
SIB0_PF1 (plane 1)  Plane Enabled, Links OK
SIB1_PFO (plane 2)  Plane Enabled, Links OK
SIB1_PF1 (plane 3)  Plane Enabled, Links OK
SIB2_PFO (plane 4)  Plane Enabled, Links OK
SIB2_PF1 (plane 5)  Plane Enabled, Links OK
SIB3_PFO (plane 6)  Plane Enabled, Links OK
SIB3_PF1 (plane 7)  Plane Enabled, Links OK
SIB4_PFO (plane 8)  Plane Enabled, Links OK
SIB4_PF1 (plane 9)  Plane Enabled, Links OK
SIB5_PFO (plane 10) Plane Enabled, Links OK
SIB5_PF1 (plane 11) Plane Enabled, Links OK

```

```
PFE #1
```

```

SIB0_PFO (plane 0)  Plane Enabled, Links OK
SIB0_PF1 (plane 1)  Plane Enabled, Links OK
SIB1_PFO (plane 2)  Plane Enabled, Links OK
SIB1_PF1 (plane 3)  Plane Enabled, Links OK
SIB2_PFO (plane 4)  Plane Enabled, Links OK
SIB2_PF1 (plane 5)  Plane Enabled, Links OK
SIB3_PFO (plane 6)  Plane Enabled, Links OK
SIB3_PF1 (plane 7)  Plane Enabled, Links OK
SIB4_PFO (plane 8)  Plane Enabled, Links OK
SIB4_PF1 (plane 9)  Plane Enabled, Links OK
SIB5_PFO (plane 10) Plane Enabled, Links OK
SIB5_PF1 (plane 11) Plane Enabled, Links OK

```

```
PFE #2
```

```

SIB0_PFO (plane 0)  Plane Enabled, Links OK
SIB0_PF1 (plane 1)  Plane Enabled, Links OK
SIB1_PFO (plane 2)  Plane Enabled, Links OK
SIB1_PF1 (plane 3)  Plane Enabled, Links OK
SIB2_PFO (plane 4)  Plane Enabled, Links OK
SIB2_PF1 (plane 5)  Plane Enabled, Links OK
SIB3_PFO (plane 6)  Plane Enabled, Links OK
SIB3_PF1 (plane 7)  Plane Enabled, Links OK
SIB4_PFO (plane 8)  Plane Enabled, Links OK
SIB4_PF1 (plane 9)  Plane Enabled, Links OK
SIB5_PFO (plane 10) Plane Enabled, Links OK
SIB5_PF1 (plane 11) Plane Enabled, Links OK

```

## PFE #3

SIB0_PFO	(plane 0)	Plane Enabled, Links OK
SIB0_PFI	(plane 1)	Plane Enabled, Links OK
SIB1_PFO	(plane 2)	Plane Enabled, Links OK
SIB1_PFI	(plane 3)	Plane Enabled, Links OK
SIB2_PFO	(plane 4)	Plane Enabled, Links OK
SIB2_PFI	(plane 5)	Plane Enabled, Links OK
SIB3_PFO	(plane 6)	Plane Enabled, Links OK
SIB3_PFI	(plane 7)	Plane Enabled, Links OK
SIB4_PFO	(plane 8)	Plane Enabled, Links OK
SIB4_PFI	(plane 9)	Plane Enabled, Links OK
SIB5_PFO	(plane 10)	Plane Enabled, Links OK
SIB5_PFI	(plane 11)	Plane Enabled, Links OK

## show chassis fabric map

**List of Syntax**    [Syntax on page 1469](#)  
[Syntax \(MX Series Router\) on page 1469](#)

**Syntax**    show chassis fabric map  
 plane <plane-number>

**Syntax (MX Series Router)**    show chassis fabric map  
 <all-members>  
 <local>  
 <member *member-id*>  
 <plane *plane-number*>

**Release Information**    Command introduced in Junos OS Release 8.0.  
 Command introduced in Junos OS Release 9.4 for EX Series switches.

**Description**    (M120 and MX Series routers and EX8200 switches only) On the M120 router, display the state of the switching fabric map for connections from the Forwarding Engine Boards (FEBs) to the ports on the fabric planes, as interpreted by the fabric plane. On the MX Series router and the EX8200 switch, display the state of the switching fabric map for connections from each Packet Forwarding Engine on the Dense Port Concentrators (DPCs) to the ports on the fabric planes, as interpreted by the fabric plane. For information about the meaning of “fabric plane”, “DPCs”, and “SIBs” on the switches, see the hardware documentation for your switch.

**Options**    **none**—Display the switching fabric map state for the M120 or MX Series router or EX8200 switch.

**all-members**—(MX Series routers only) (Optional) Display the switching fabric map state for all the members of the Virtual Chassis configuration.

**local**—(MX Series routers only) (Optional) Display the switching fabric map state for the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Display the switching fabric map state for the specified member of the Virtual Chassis configuration. Replace the *member-id* with a value of 0 or 1.

**plane *plane-number***—(Optional) Display the state of the fabric link for the specified plane number.

- For the M120 router, replace *plane-number* with a value from 0 through 3.
- For the MX480 and MX240 routers, replace *plane-number* with a value from 0 through 7.
- For the MX960 router, replace *plane-number* with a value from 0 through 5.

- For the EX8208 switch, replace *plane-number* with a value from 0 through 11.
- For the EX8216 switch, replace *plane-number* with a value from 0 through 7.

**Required Privilege Level** view

**List of Sample Output** [show chassis fabric map \(M120 Router\) on page 1470](#)  
[show chassis fabric map \(MX Series Routers\) on page 1471](#)  
[show chassis fabric map plane 1 \(EX8200 Switch\) on page 1474](#)

**Output Fields** [Table 125 on page 1470](#) lists the output fields for the **show chassis fabric map** command. Output fields are listed in the approximate order in which they appear.

*Table 125: show chassis fabric map Output Fields*

Field Name	Field Description
in-links	Fabric map for receive side links.
out-links	Fabric map for transmit side links.
state	<p>State of the fabric link:</p> <ul style="list-style-type: none"> <li>• <b>RESET</b>—Link between SIB and FPC/DPC is powered down on purpose. This is done in all non-dual PFE based boards.</li> <li>• <b>UP</b>—Link between SIB and FPC/DPC is up and running.</li> <li>• <b>DOWN</b>—Link between SIB and FPC/DPC is powered down.</li> <li>• <b>FAULT</b>—SIB is in alarmed state where the SIB's plane is not operational for the following reasons: <ul style="list-style-type: none"> <li>• On-board F-chip is not operational.</li> <li>• Fiber optic connector faults.</li> <li>• FPC connector faults.</li> <li>• SIB midplane connector faults.</li> </ul> </li> </ul>

## Sample Output

### show chassis fabric map (M120 Router)

```
user@host> show chassis fabric map
FEB0->CB0F0_00 up CB0F0_08->FEB7 Down
FEB1->CB0F0_01 Down CB0F0_09->FEB6 Down
FEB6->CB0F0_02 Down CB0F0_10->FEB1 Down
FEB2->CB0F0_03 Down CB0F0_11->FEB0 up
FEB3->CB0F0_04 Down CB0F0_12->FEB3 Down
```



```

FEB4->CB0F0_05 up CB0F0_13->FEB2 Down

FEB7->CB0F0_06 Down CB0F0_14->FEB5 Down

FEB5->CB0F0_07 Down CB0F0_15->FEB4 up:

```

### show chassis fabric map (MX Series Routers)

```
user@host> show chassis fabric map
```

DPC4PFE0->CB0F0_00_0	up	CB0F0_00_0->DPC4PFE0	up
DPC4PFE1->CB0F0_00_1	up	CB0F0_00_1->DPC4PFE1	up
DPC4PFE2->CB0F0_00_2	up	CB0F0_00_2->DPC4PFE2	up
DPC4PFE3->CB0F0_00_3	up	CB0F0_00_3->DPC4PFE3	up
DPC7PFE0->CB0F0_01_0	Down	CB0F0_01_0->DPC7PFE0	Down
DPC7PFE1->CB0F0_01_1	Down	CB0F0_01_1->DPC7PFE1	Down
DPC7PFE2->CB0F0_01_2	Down	CB0F0_01_2->DPC7PFE2	Down
DPC7PFE3->CB0F0_01_3	Down	CB0F0_01_3->DPC7PFE3	Down
DPC3PFE0->CB0F0_03_0	Down	CB0F0_03_0->DPC3PFE0	Down
DPC3PFE1->CB0F0_03_1	Down	CB0F0_03_1->DPC3PFE1	Down
DPC3PFE2->CB0F0_03_2	Down	CB0F0_03_2->DPC3PFE2	Down
DPC3PFE3->CB0F0_03_3	Down	CB0F0_03_3->DPC3PFE3	Down
DPC8PFE0->CB0F0_05_0	Down	CB0F0_05_0->DPC8PFE0	Down
DPC8PFE1->CB0F0_05_1	Down	CB0F0_05_1->DPC8PFE1	Down
DPC8PFE2->CB0F0_05_2	Down	CB0F0_05_2->DPC8PFE2	Down
DPC8PFE3->CB0F0_05_3	Down	CB0F0_05_3->DPC8PFE3	Down
DPC1PFE0->CB0F0_06_0	Down	CB0F0_06_0->DPC1PFE0	Down
DPC1PFE1->CB0F0_06_1	Down	CB0F0_06_1->DPC1PFE1	Down
DPC1PFE2->CB0F0_06_2	Down	CB0F0_06_2->DPC1PFE2	Down
DPC1PFE3->CB0F0_06_3	Down	CB0F0_06_3->DPC1PFE3	Down
DPC10PFE0->CB0F0_07_0	Down	CB0F0_07_0->DPC10PFE0	Down
DPC10PFE1->CB0F0_07_1	Down	CB0F0_07_1->DPC10PFE1	Down
DPC10PFE2->CB0F0_07_2	Down	CB0F0_07_2->DPC10PFE2	Down
DPC10PFE3->CB0F0_07_3	Down	CB0F0_07_3->DPC10PFE3	Down
DPC11PFE0->CB0F0_08_0	Down	CB0F0_08_0->DPC11PFE0	Down
DPC11PFE1->CB0F0_08_1	Down	CB0F0_08_1->DPC11PFE1	Down
DPC11PFE2->CB0F0_08_2	Down	CB0F0_08_2->DPC11PFE2	Down
DPC11PFE3->CB0F0_08_3	Down	CB0F0_08_3->DPC11PFE3	Down
DPC0PFE0->CB0F0_09_0	Down	CB0F0_09_0->DPC0PFE0	Down
DPC0PFE1->CB0F0_09_1	Down	CB0F0_09_1->DPC0PFE1	Down
DPC0PFE2->CB0F0_09_2	Down	CB0F0_09_2->DPC0PFE2	Down
DPC0PFE3->CB0F0_09_3	Down	CB0F0_09_3->DPC0PFE3	Down
DPC9PFE0->CB0F0_11_0	Down	CB0F0_11_0->DPC9PFE0	Down
DPC9PFE1->CB0F0_11_1	Down	CB0F0_11_1->DPC9PFE1	Down
DPC9PFE2->CB0F0_11_2	Down	CB0F0_11_2->DPC9PFE2	Down
DPC9PFE3->CB0F0_11_3	Down	CB0F0_11_3->DPC9PFE3	Down
DPC2PFE0->CB0F0_13_0	up	CB0F0_13_0->DPC2PFE0	up
DPC2PFE1->CB0F0_13_1	up	CB0F0_13_1->DPC2PFE1	up
DPC2PFE2->CB0F0_13_2	up	CB0F0_13_2->DPC2PFE2	up
DPC2PFE3->CB0F0_13_3	up	CB0F0_13_3->DPC2PFE3	up
DPC6PFE0->CB0F0_14_0	Down	CB0F0_14_0->DPC6PFE0	Down
DPC6PFE1->CB0F0_14_1	Down	CB0F0_14_1->DPC6PFE1	Down
DPC6PFE2->CB0F0_14_2	Down	CB0F0_14_2->DPC6PFE2	Down
DPC6PFE3->CB0F0_14_3	Down	CB0F0_14_3->DPC6PFE3	Down
DPC5PFE0->CB0F0_15_0	Down	CB0F0_15_0->DPC5PFE0	Down
DPC5PFE1->CB0F0_15_1	Down	CB0F0_15_1->DPC5PFE1	Down
DPC5PFE2->CB0F0_15_2	Down	CB0F0_15_2->DPC5PFE2	Down
DPC5PFE3->CB0F0_15_3	Down	CB0F0_15_3->DPC5PFE3	Down
DPC4PFE0->CB0F1_00_0	up	CB0F1_00_0->DPC4PFE0	up
DPC4PFE1->CB0F1_00_1	up	CB0F1_00_1->DPC4PFE1	up

DPC4PFE2->CB0F1_00_2	up	CB0F1_00_2->DPC4PFE2	up
DPC4PFE3->CB0F1_00_3	up	CB0F1_00_3->DPC4PFE3	up
DPC7PFE0->CB0F1_01_0	Down	CB0F1_01_0->DPC7PFE0	Down
DPC7PFE1->CB0F1_01_1	Down	CB0F1_01_1->DPC7PFE1	Down
DPC7PFE2->CB0F1_01_2	Down	CB0F1_01_2->DPC7PFE2	Down
DPC7PFE3->CB0F1_01_3	Down	CB0F1_01_3->DPC7PFE3	Down
DPC3PFE0->CB0F1_03_0	Down	CB0F1_03_0->DPC3PFE0	Down
DPC3PFE1->CB0F1_03_1	Down	CB0F1_03_1->DPC3PFE1	Down
DPC3PFE2->CB0F1_03_2	Down	CB0F1_03_2->DPC3PFE2	Down
DPC3PFE3->CB0F1_03_3	Down	CB0F1_03_3->DPC3PFE3	Down
DPC8PFE0->CB0F1_05_0	Down	CB0F1_05_0->DPC8PFE0	Down
DPC8PFE1->CB0F1_05_1	Down	CB0F1_05_1->DPC8PFE1	Down
DPC8PFE2->CB0F1_05_2	Down	CB0F1_05_2->DPC8PFE2	Down
DPC8PFE3->CB0F1_05_3	Down	CB0F1_05_3->DPC8PFE3	Down
DPC1PFE0->CB0F1_06_0	Down	CB0F1_06_0->DPC1PFE0	Down
DPC1PFE1->CB0F1_06_1	Down	CB0F1_06_1->DPC1PFE1	Down
DPC1PFE2->CB0F1_06_2	Down	CB0F1_06_2->DPC1PFE2	Down
DPC1PFE3->CB0F1_06_3	Down	CB0F1_06_3->DPC1PFE3	Down
DPC10PFE0->CB0F1_07_0	Down	CB0F1_07_0->DPC10PFE0	Down
DPC10PFE1->CB0F1_07_1	Down	CB0F1_07_1->DPC10PFE1	Down
DPC10PFE2->CB0F1_07_2	Down	CB0F1_07_2->DPC10PFE2	Down
DPC10PFE3->CB0F1_07_3	Down	CB0F1_07_3->DPC10PFE3	Down
DPC11PFE0->CB0F1_08_0	Down	CB0F1_08_0->DPC11PFE0	Down
DPC11PFE1->CB0F1_08_1	Down	CB0F1_08_1->DPC11PFE1	Down
DPC11PFE2->CB0F1_08_2	Down	CB0F1_08_2->DPC11PFE2	Down
DPC11PFE3->CB0F1_08_3	Down	CB0F1_08_3->DPC11PFE3	Down
DPC0PFE0->CB0F1_09_0	Down	CB0F1_09_0->DPC0PFE0	Down
DPC0PFE1->CB0F1_09_1	Down	CB0F1_09_1->DPC0PFE1	Down
DPC0PFE2->CB0F1_09_2	Down	CB0F1_09_2->DPC0PFE2	Down
DPC0PFE3->CB0F1_09_3	Down	CB0F1_09_3->DPC0PFE3	Down
DPC9PFE0->CB0F1_11_0	Down	CB0F1_11_0->DPC9PFE0	Down
DPC9PFE1->CB0F1_11_1	Down	CB0F1_11_1->DPC9PFE1	Down
DPC9PFE2->CB0F1_11_2	Down	CB0F1_11_2->DPC9PFE2	Down
DPC9PFE3->CB0F1_11_3	Down	CB0F1_11_3->DPC9PFE3	Down
DPC2PFE0->CB0F1_13_0	up	CB0F1_13_0->DPC2PFE0	up
DPC2PFE1->CB0F1_13_1	up	CB0F1_13_1->DPC2PFE1	up
DPC2PFE2->CB0F1_13_2	up	CB0F1_13_2->DPC2PFE2	up
DPC2PFE3->CB0F1_13_3	up	CB0F1_13_3->DPC2PFE3	up
DPC6PFE0->CB0F1_14_0	Down	CB0F1_14_0->DPC6PFE0	Down
DPC6PFE1->CB0F1_14_1	Down	CB0F1_14_1->DPC6PFE1	Down
DPC6PFE2->CB0F1_14_2	Down	CB0F1_14_2->DPC6PFE2	Down
DPC6PFE3->CB0F1_14_3	Down	CB0F1_14_3->DPC6PFE3	Down
DPC5PFE0->CB0F1_15_0	Down	CB0F1_15_0->DPC5PFE0	Down
DPC5PFE1->CB0F1_15_1	Down	CB0F1_15_1->DPC5PFE1	Down
DPC5PFE2->CB0F1_15_2	Down	CB0F1_15_2->DPC5PFE2	Down
DPC5PFE3->CB0F1_15_3	Down	CB0F1_15_3->DPC5PFE3	Down
DPC4PFE0->CB1F0_00_0	up	CB1F0_00_0->DPC4PFE0	up
DPC4PFE1->CB1F0_00_1	up	CB1F0_00_1->DPC4PFE1	up
DPC4PFE2->CB1F0_00_2	up	CB1F0_00_2->DPC4PFE2	up
DPC4PFE3->CB1F0_00_3	up	CB1F0_00_3->DPC4PFE3	up
DPC7PFE0->CB1F0_01_0	Down	CB1F0_01_0->DPC7PFE0	Down
DPC7PFE1->CB1F0_01_1	Down	CB1F0_01_1->DPC7PFE1	Down
DPC7PFE2->CB1F0_01_2	Down	CB1F0_01_2->DPC7PFE2	Down
DPC7PFE3->CB1F0_01_3	Down	CB1F0_01_3->DPC7PFE3	Down
DPC3PFE0->CB1F0_03_0	Down	CB1F0_03_0->DPC3PFE0	Down
DPC3PFE1->CB1F0_03_1	Down	CB1F0_03_1->DPC3PFE1	Down
DPC3PFE2->CB1F0_03_2	Down	CB1F0_03_2->DPC3PFE2	Down
DPC3PFE3->CB1F0_03_3	Down	CB1F0_03_3->DPC3PFE3	Down
DPC8PFE0->CB1F0_05_0	Down	CB1F0_05_0->DPC8PFE0	Down
DPC8PFE1->CB1F0_05_1	Down	CB1F0_05_1->DPC8PFE1	Down

DPC8PFE2->CB1F0_05_2	Down	CB1F0_05_2->DPC8PFE2	Down
DPC8PFE3->CB1F0_05_3	Down	CB1F0_05_3->DPC8PFE3	Down
DPC1PFE0->CB1F0_06_0	Down	CB1F0_06_0->DPC1PFE0	Down
DPC1PFE1->CB1F0_06_1	Down	CB1F0_06_1->DPC1PFE1	Down
DPC1PFE2->CB1F0_06_2	Down	CB1F0_06_2->DPC1PFE2	Down
DPC1PFE3->CB1F0_06_3	Down	CB1F0_06_3->DPC1PFE3	Down
DPC10PFE0->CB1F0_07_0	Down	CB1F0_07_0->DPC10PFE0	Down
DPC10PFE1->CB1F0_07_1	Down	CB1F0_07_1->DPC10PFE1	Down
DPC10PFE2->CB1F0_07_2	Down	CB1F0_07_2->DPC10PFE2	Down
DPC10PFE3->CB1F0_07_3	Down	CB1F0_07_3->DPC10PFE3	Down
DPC11PFE0->CB1F0_08_0	Down	CB1F0_08_0->DPC11PFE0	Down
DPC11PFE1->CB1F0_08_1	Down	CB1F0_08_1->DPC11PFE1	Down
DPC11PFE2->CB1F0_08_2	Down	CB1F0_08_2->DPC11PFE2	Down
DPC11PFE3->CB1F0_08_3	Down	CB1F0_08_3->DPC11PFE3	Down
DPC0PFE0->CB1F0_09_0	Down	CB1F0_09_0->DPC0PFE0	Down
DPC0PFE1->CB1F0_09_1	Down	CB1F0_09_1->DPC0PFE1	Down
DPC0PFE2->CB1F0_09_2	Down	CB1F0_09_2->DPC0PFE2	Down
DPC0PFE3->CB1F0_09_3	Down	CB1F0_09_3->DPC0PFE3	Down
DPC9PFE0->CB1F0_11_0	Down	CB1F0_11_0->DPC9PFE0	Down
DPC9PFE1->CB1F0_11_1	Down	CB1F0_11_1->DPC9PFE1	Down
DPC9PFE2->CB1F0_11_2	Down	CB1F0_11_2->DPC9PFE2	Down
DPC9PFE3->CB1F0_11_3	Down	CB1F0_11_3->DPC9PFE3	Down
DPC2PFE0->CB1F0_13_0	up	CB1F0_13_0->DPC2PFE0	up
DPC2PFE1->CB1F0_13_1	up	CB1F0_13_1->DPC2PFE1	up
DPC2PFE2->CB1F0_13_2	up	CB1F0_13_2->DPC2PFE2	up
DPC2PFE3->CB1F0_13_3	up	CB1F0_13_3->DPC2PFE3	up
DPC6PFE0->CB1F0_14_0	Down	CB1F0_14_0->DPC6PFE0	Down
DPC6PFE1->CB1F0_14_1	Down	CB1F0_14_1->DPC6PFE1	Down
DPC6PFE2->CB1F0_14_2	Down	CB1F0_14_2->DPC6PFE2	Down
DPC6PFE3->CB1F0_14_3	Down	CB1F0_14_3->DPC6PFE3	Down
DPC5PFE0->CB1F0_15_0	Down	CB1F0_15_0->DPC5PFE0	Down
DPC5PFE1->CB1F0_15_1	Down	CB1F0_15_1->DPC5PFE1	Down
DPC5PFE2->CB1F0_15_2	Down	CB1F0_15_2->DPC5PFE2	Down
DPC5PFE3->CB1F0_15_3	Down	CB1F0_15_3->DPC5PFE3	Down
DPC4PFE0->CB1F1_00_0	up	CB1F1_00_0->DPC4PFE0	up
DPC4PFE1->CB1F1_00_1	up	CB1F1_00_1->DPC4PFE1	up
DPC4PFE2->CB1F1_00_2	up	CB1F1_00_2->DPC4PFE2	up
DPC4PFE3->CB1F1_00_3	up	CB1F1_00_3->DPC4PFE3	up
DPC7PFE0->CB1F1_01_0	Down	CB1F1_01_0->DPC7PFE0	Down
DPC7PFE1->CB1F1_01_1	Down	CB1F1_01_1->DPC7PFE1	Down
DPC7PFE2->CB1F1_01_2	Down	CB1F1_01_2->DPC7PFE2	Down
DPC7PFE3->CB1F1_01_3	Down	CB1F1_01_3->DPC7PFE3	Down
DPC3PFE0->CB1F1_03_0	Down	CB1F1_03_0->DPC3PFE0	Down
DPC3PFE1->CB1F1_03_1	Down	CB1F1_03_1->DPC3PFE1	Down
DPC3PFE2->CB1F1_03_2	Down	CB1F1_03_2->DPC3PFE2	Down
DPC3PFE3->CB1F1_03_3	Down	CB1F1_03_3->DPC3PFE3	Down
DPC8PFE0->CB1F1_05_0	Down	CB1F1_05_0->DPC8PFE0	Down
DPC8PFE1->CB1F1_05_1	Down	CB1F1_05_1->DPC8PFE1	Down
DPC8PFE2->CB1F1_05_2	Down	CB1F1_05_2->DPC8PFE2	Down
DPC8PFE3->CB1F1_05_3	Down	CB1F1_05_3->DPC8PFE3	Down
DPC1PFE0->CB1F1_06_0	Down	CB1F1_06_0->DPC1PFE0	Down
DPC1PFE1->CB1F1_06_1	Down	CB1F1_06_1->DPC1PFE1	Down
DPC1PFE2->CB1F1_06_2	Down	CB1F1_06_2->DPC1PFE2	Down
DPC1PFE3->CB1F1_06_3	Down	CB1F1_06_3->DPC1PFE3	Down
DPC10PFE0->CB1F1_07_0	Down	CB1F1_07_0->DPC10PFE0	Down
DPC10PFE1->CB1F1_07_1	Down	CB1F1_07_1->DPC10PFE1	Down
DPC10PFE2->CB1F1_07_2	Down	CB1F1_07_2->DPC10PFE2	Down
DPC10PFE3->CB1F1_07_3	Down	CB1F1_07_3->DPC10PFE3	Down
DPC11PFE0->CB1F1_08_0	Down	CB1F1_08_0->DPC11PFE0	Down
DPC11PFE1->CB1F1_08_1	Down	CB1F1_08_1->DPC11PFE1	Down

DPC11PFE2->CB1F1_08_2	Down	CB1F1_08_2->DPC11PFE2	Down
DPC11PFE3->CB1F1_08_3	Down	CB1F1_08_3->DPC11PFE3	Down
DPC0PFE0->CB1F1_09_0	Down	CB1F1_09_0->DPC0PFE0	Down
DPC0PFE1->CB1F1_09_1	Down	CB1F1_09_1->DPC0PFE1	Down
DPC0PFE2->CB1F1_09_2	Down	CB1F1_09_2->DPC0PFE2	Down
DPC0PFE3->CB1F1_09_3	Down	CB1F1_09_3->DPC0PFE3	Down
DPC9PFE0->CB1F1_11_0	Down	CB1F1_11_0->DPC9PFE0	Down
DPC9PFE1->CB1F1_11_1	Down	CB1F1_11_1->DPC9PFE1	Down
DPC9PFE2->CB1F1_11_2	Down	CB1F1_11_2->DPC9PFE2	Down
DPC9PFE3->CB1F1_11_3	Down	CB1F1_11_3->DPC9PFE3	Down
DPC2PFE0->CB1F1_13_0	up	CB1F1_13_0->DPC2PFE0	up
DPC2PFE1->CB1F1_13_1	up	CB1F1_13_1->DPC2PFE1	up
DPC2PFE2->CB1F1_13_2	up	CB1F1_13_2->DPC2PFE2	up
DPC2PFE3->CB1F1_13_3	up	CB1F1_13_3->DPC2PFE3	up
DPC6PFE0->CB1F1_14_0	Down	CB1F1_14_0->DPC6PFE0	Down
DPC6PFE1->CB1F1_14_1	Down	CB1F1_14_1->DPC6PFE1	Down
DPC6PFE2->CB1F1_14_2	Down	CB1F1_14_2->DPC6PFE2	Down
DPC6PFE3->CB1F1_14_3	Down	CB1F1_14_3->DPC6PFE3	Down
DPC5PFE0->CB1F1_15_0	Down	CB1F1_15_0->DPC5PFE0	Down
DPC5PFE1->CB1F1_15_1	Down	CB1F1_15_1->DPC5PFE1	Down
DPC5PFE2->CB1F1_15_2	Down	CB1F1_15_2->DPC5PFE2	Down
DPC5PFE3->CB1F1_15_3	Down	CB1F1_15_3->DPC5PFE3	Down
plane 4 is not up			
plane 5 is not up			

#### show chassis fabric map plane 1 (EX8200 Switch)

```
user@host> show chassis fabric map plane 1
```

```
user@host> show chassis fabric map plane 1
DPC6PFE0->CB0F0_00_0    Down    CB0F0_00_0->DPC6PFE0    Down
DPC6PFE1->CB0F0_00_1    Down    CB0F0_00_1->DPC6PFE1    Down
DPC6PFE2->CB0F0_00_2    Down    CB0F0_00_2->DPC6PFE2    Down
DPC6PFE3->CB0F0_00_3    Down    CB0F0_00_3->DPC6PFE3    Down
DPC0PFE0->CB0F0_01_0    Down    CB0F0_01_0->DPC0PFE0    Down
DPC0PFE1->CB0F0_01_1    Down    CB0F0_01_1->DPC0PFE1    Down
DPC0PFE2->CB0F0_01_2    Down    CB0F0_01_2->DPC0PFE2    Down
DPC0PFE3->CB0F0_01_3    Down    CB0F0_01_3->DPC0PFE3    Down
DPC5PFE0->CB0F0_02_0    Down    CB0F0_02_0->DPC5PFE0    Down
DPC5PFE1->CB0F0_02_1    Down    CB0F0_02_1->DPC5PFE1    Down
DPC5PFE2->CB0F0_02_2    Down    CB0F0_02_2->DPC5PFE2    Down
DPC5PFE3->CB0F0_02_3    Down    CB0F0_02_3->DPC5PFE3    Down
DPC3PFE0->CB0F0_03_0    Down    CB0F0_03_0->DPC3PFE0    Down
DPC3PFE1->CB0F0_03_1    Down    CB0F0_03_1->DPC3PFE1    Down
DPC3PFE2->CB0F0_03_2    Down    CB0F0_03_2->DPC3PFE2    Down
DPC3PFE3->CB0F0_03_3    Down    CB0F0_03_3->DPC3PFE3    Down
DPC4PFE0->CB0F0_04_0    Down    CB0F0_04_0->DPC4PFE0    Down
DPC4PFE1->CB0F0_04_1    Down    CB0F0_04_1->DPC4PFE1    Down
DPC4PFE2->CB0F0_04_2    Down    CB0F0_04_2->DPC4PFE2    Down
DPC4PFE3->CB0F0_04_3    Down    CB0F0_04_3->DPC4PFE3    Down
DPC2PFE0->CB0F0_05_0    Down    CB0F0_05_0->DPC2PFE0    Down
DPC2PFE1->CB0F0_05_1    Down    CB0F0_05_1->DPC2PFE1    Down
DPC2PFE2->CB0F0_05_2    Down    CB0F0_05_2->DPC2PFE2    Down
DPC2PFE3->CB0F0_05_3    Down    CB0F0_05_3->DPC2PFE3    Down
DPC7PFE0->CB0F0_06_0    Down    CB0F0_06_0->DPC7PFE0    Down
DPC7PFE1->CB0F0_06_1    Down    CB0F0_06_1->DPC7PFE1    Down
DPC7PFE2->CB0F0_06_2    Down    CB0F0_06_2->DPC7PFE2    Down
DPC7PFE3->CB0F0_06_3    Down    CB0F0_06_3->DPC7PFE3    Down
DPC1PFE0->CB0F0_07_0    Down    CB0F0_07_0->DPC1PFE0    Down
DPC1PFE1->CB0F0_07_1    Down    CB0F0_07_1->DPC1PFE1    Down
```

DPC1PFE2->CB0F0_07_2	Down	CB0F0_07_2->DPC1PFE2	Down
DPC1PFE3->CB0F0_07_3	Down	CB0F0_07_3->DPC1PFE3	Down
DPC0PFE0->CB0F0_08_0	Down	CB0F0_08_0->DPC0PFE0	Down
DPC0PFE1->CB0F0_08_1	Down	CB0F0_08_1->DPC0PFE1	Down
DPC0PFE2->CB0F0_08_2	Down	CB0F0_08_2->DPC0PFE2	Down
DPC0PFE3->CB0F0_08_3	Down	CB0F0_08_3->DPC0PFE3	Down
DPC7PFE0->CB0F0_09_0	Down	CB0F0_09_0->DPC7PFE0	Down
DPC7PFE1->CB0F0_09_1	Down	CB0F0_09_1->DPC7PFE1	Down
DPC7PFE2->CB0F0_09_2	Down	CB0F0_09_2->DPC7PFE2	Down
DPC7PFE3->CB0F0_09_3	Down	CB0F0_09_3->DPC7PFE3	Down
DPC1PFE0->CB0F0_10_0	Down	CB0F0_10_0->DPC1PFE0	Down
DPC1PFE1->CB0F0_10_1	Down	CB0F0_10_1->DPC1PFE1	Down
DPC1PFE2->CB0F0_10_2	Down	CB0F0_10_2->DPC1PFE2	Down
DPC1PFE3->CB0F0_10_3	Down	CB0F0_10_3->DPC1PFE3	Down
DPC4PFE0->CB0F0_11_0	Down	CB0F0_11_0->DPC4PFE0	Down
DPC4PFE1->CB0F0_11_1	Down	CB0F0_11_1->DPC4PFE1	Down
DPC4PFE2->CB0F0_11_2	Down	CB0F0_11_2->DPC4PFE2	Down
DPC4PFE3->CB0F0_11_3	Down	CB0F0_11_3->DPC4PFE3	Down
DPC2PFE0->CB0F0_12_0	Down	CB0F0_12_0->DPC2PFE0	Down
DPC2PFE1->CB0F0_12_1	Down	CB0F0_12_1->DPC2PFE1	Down
DPC2PFE2->CB0F0_12_2	Down	CB0F0_12_2->DPC2PFE2	Down
DPC2PFE3->CB0F0_12_3	Down	CB0F0_12_3->DPC2PFE3	Down
DPC5PFE0->CB0F0_13_0	Down	CB0F0_13_0->DPC5PFE0	Down
DPC5PFE1->CB0F0_13_1	Down	CB0F0_13_1->DPC5PFE1	Down
DPC5PFE2->CB0F0_13_2	Down	CB0F0_13_2->DPC5PFE2	Down
DPC5PFE3->CB0F0_13_3	Down	CB0F0_13_3->DPC5PFE3	Down
DPC3PFE0->CB0F0_14_0	Down	CB0F0_14_0->DPC3PFE0	Down
DPC3PFE1->CB0F0_14_1	Down	CB0F0_14_1->DPC3PFE1	Down
DPC3PFE2->CB0F0_14_2	Down	CB0F0_14_2->DPC3PFE2	Down
DPC3PFE3->CB0F0_14_3	Down	CB0F0_14_3->DPC3PFE3	Down
DPC6PFE0->CB0F0_15_0	Down	CB0F0_15_0->DPC6PFE0	Down
DPC6PFE1->CB0F0_15_1	Down	CB0F0_15_1->DPC6PFE1	Down
DPC6PFE2->CB0F0_15_2	Down	CB0F0_15_2->DPC6PFE2	Down
DPC6PFE3->CB0F0_15_3	Down	CB0F0_15_3->DPC6PFE3	Down

## show chassis fabric optics

<b>Syntax (TX Matrix Plus Router with 3D SIBs)</b>	<pre>show chassis fabric optics &lt;sib-slot&gt; &lt;lcc number   sfc number&gt; &lt;brief   detail&gt;</pre>
<b>Release Information</b>	Command introduced in Junos OS Release 13.1 for the TX Matrix Plus router with 3D SIBs.
<b>Description</b>	(TX Matrix Plus routers with 3D SIBs only) Display information about the optical ports on the TX Matrix Plus router (or the switch-fabric chassis (SFC)) and on the T1600 or T4000 line-card chassis (LCCs) connected to it in a routing matrix.
<b>Options</b>	<p><b>none</b>—Display brief information about the optical ports on the SFC and LCCs in the routing matrix.</p> <p><b>sib-number</b>—(Optional) Display information about the optical ports for the specified SIB number.</p> <p><b>lcc number</b>—(Optional) Display information about the optical ports for the specified T1600 or T4000 LCC that is connected to a TX Matrix Plus router with 3D SIBs. Replace <b>number</b> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> <li>From <b>0</b> through <b>7</b> on a T1600 router connected to a TX Matrix Plus router with 3D SIBs.</li> <li><b>0, 2, 4, or 6</b> on a T4000 router connected to a TX Matrix Plus router with 3D SIBs.</li> </ul> <p><b>sfc number</b>—(Optional) Display information about the optical ports for the specified SFC number. Replace <b>number</b> with <b>0</b>.</p> <p><b>brief</b>—(Optional) Display brief information about the optical ports.</p> <p><b>detail</b>—(Optional) Display detailed information about the optical ports.</p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><i>Overview of a Routing Matrix with a TX Matrix Plus Router</i></li> </ul>
<b>List of Sample Output</b>	<a href="#">show chassis fabric optics (TX Matrix Plus Router with 3D SIBs) on page 1477</a> <a href="#">show chassis fabric optics (TX Matrix Plus Router with 3D SIBs) on page 1482</a> <a href="#">show chassis fabric optics sfc (TX Matrix Plus Router with 3D SIBs) on page 1483</a> <a href="#">show chassis fabric optics lcc (TX Matrix Plus Router with 3D SIBs) on page 1485</a>
<b>Output Fields</b>	Table 126 on page 1477 lists the output fields for the <b>show chassis fabric optics</b> command. Output fields are listed in the approximate order in which they appear.

Table 126: show chassis fabric optics Output Fields

Field Name	Field Description
<b>Port</b>	Indicates port number.
<b>Cable state</b>	<p>Indicates the cable state:</p> <ul style="list-style-type: none"> <li>• <b>CABLE_CONNECTED</b>—Cable is connected properly and is in an operable state.</li> <li>• <b>CABLE_LOOPBACK</b>—A loopback cable is connected to the port.</li> <li>• <b>CABLE_NOT_CONNECTED</b>—The optical port is not connected with any cable or all the channels are powered off on the remote side.</li> <li>• <b>CABLE_MIS_CONNECTED</b>—Cable is connected to an incorrect optical port.</li> <li>• <b>CABLE_CONNECTED_WITH_ERROR</b>—Cable is connected to the optical port, but indicates a cable issue. Refer to the optical cable fault alarms to identify the cable issue.</li> <li>• <b>CABLE_NOT_SUPPORTED</b>—The connected optics module is not supported. Only optics modules having Juniper Networks part numbers are supported.</li> <li>• <b>CABLE_MODULE_ABSENT</b>—No optics module is connected.</li> <li>• <b>CABLE_MODULE_FAULT</b>—The connected optics module has an irrecoverable fault. The optics module must be replaced for the device to recover from this error. This state can be caused by a device failure during initialization, a device crossing the high-temperature threshold, or a voltage failure on the optics module during normal operation.</li> <li>• <b>CABLE_ELEC_LOOPBACK</b>—An electrical loopback module is connected to the optics port.</li> </ul> <p><b>NOTE:</b> Only electrical loopback modules from ELPEUS are supported.</p> <ul style="list-style-type: none"> <li>• <b>CABLE_ERROR</b>—Cable cannot be detected, probably because the SIB is not online yet.</li> </ul>
<b>Module Type</b>	Indicates module type.

## Sample Output

### show chassis fabric optics (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric optics
```

```
sfc0-re0:
```

```
-----
Port      Cable state      Module Type
sfc0-f13sib0:
0         MODULE_ABSENT    No Module
1         MODULE_ABSENT    No Module
2         CABLE_CONNECTED  CXP Module
3         CABLE_CONNECTED  CXP Module
4         MODULE_ABSENT    No Module
5         MODULE_ABSENT    No Module
6         MODULE_ABSENT    No Module
7         MODULE_ABSENT    No Module
8         CABLE_CONNECTED  CXP Module
9         MODULE_ABSENT    No Module
```

```

10      MODULE_ABSENT      No Module
11      MODULE_ABSENT      No Module
12      MODULE_ABSENT      No Module
13      MODULE_ABSENT      No Module
14      MODULE_ABSENT      No Module
15      MODULE_ABSENT      No Module
sfc0-f13sib1:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      MODULE_ABSENT      No Module
3      MODULE_ABSENT      No Module
4      CABLE_CONNECTED    CXP Module
5      CABLE_CONNECTED    CXP Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
8      MODULE_ABSENT      No Module
9      CABLE_CONNECTED    CXP Module
10     MODULE_ABSENT      No Module
11     MODULE_ABSENT      No Module
12     MODULE_ABSENT      No Module
13     MODULE_ABSENT      No Module
14     MODULE_ABSENT      No Module
15     CABLE_CONNECTED    CXP Module
sfc0-f13sib2: SIB slot invalid
sfc0-f13sib3:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      CABLE_CONNECTED    CXP Module
3      CABLE_CONNECTED    CXP Module
4      MODULE_ABSENT      No Module
5      MODULE_ABSENT      No Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
8      CABLE_CONNECTED    CXP Module
9      MODULE_ABSENT      No Module
10     MODULE_ABSENT      No Module
11     MODULE_ABSENT      No Module
12     MODULE_ABSENT      No Module
13     MODULE_ABSENT      No Module
14     MODULE_ABSENT      No Module
15     MODULE_ABSENT      No Module
sfc0-f13sib4:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      MODULE_ABSENT      No Module
3      MODULE_ABSENT      No Module
4      CABLE_CONNECTED    CXP Module
5      CABLE_CONNECTED    CXP Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
8      MODULE_ABSENT      No Module
9      CABLE_CONNECTED    CXP Module
10     MODULE_ABSENT      No Module
11     MODULE_ABSENT      No Module
12     MODULE_ABSENT      No Module
13     MODULE_ABSENT      No Module
14     MODULE_ABSENT      No Module
15     CABLE_CONNECTED    CXP Module
sfc0-f13sib5: SIB slot invalid
sfc0-f13sib6:

```



```

0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      CABLE_CONNECTED    CXP Module
3      CABLE_CONNECTED    CXP Module
4      MODULE_ABSENT      No Module
5      MODULE_ABSENT      No Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
8      CABLE_CONNECTED    CXP Module
9      MODULE_ABSENT      No Module
10     MODULE_ABSENT      No Module
11     MODULE_ABSENT      No Module
12     MODULE_ABSENT      No Module
13     MODULE_ABSENT      No Module
14     MODULE_ABSENT      No Module
15     MODULE_ABSENT      No Module
sfc0-f13sib7:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      MODULE_ABSENT      No Module
3      MODULE_ABSENT      No Module
4      CABLE_CONNECTED    CXP Module
5      CABLE_CONNECTED    CXP Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
8      MODULE_ABSENT      No Module
9      CABLE_CONNECTED    CXP Module
10     MODULE_ABSENT      No Module
11     MODULE_ABSENT      No Module
12     MODULE_ABSENT      No Module
13     MODULE_ABSENT      No Module
14     MODULE_ABSENT      No Module
15     CABLE_CONNECTED    CXP Module
sfc0-f13sib8:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      CABLE_CONNECTED    CXP Module
3      CABLE_CONNECTED    CXP Module
4      MODULE_ABSENT      No Module
5      MODULE_ABSENT      No Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
8      CABLE_CONNECTED    CXP Module
9      MODULE_ABSENT      No Module
10     MODULE_ABSENT      No Module
11     MODULE_ABSENT      No Module
12     MODULE_ABSENT      No Module
13     MODULE_ABSENT      No Module
14     MODULE_ABSENT      No Module
15     MODULE_ABSENT      No Module
sfc0-f13sib9:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      MODULE_ABSENT      No Module
3      MODULE_ABSENT      No Module
4      CABLE_CONNECTED    CXP Module
5      CABLE_CONNECTED    CXP Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
8      MODULE_ABSENT      No Module

```

```

9          CABLE_CONNECTED      CXP Module
10         MODULE_ABSENT        No Module
11         MODULE_ABSENT        No Module
12         MODULE_ABSENT        No Module
13         MODULE_ABSENT        No Module
14         MODULE_ABSENT        No Module
15         CABLE_CONNECTED      CXP Module
sfc0-f13sib10: SIB slot invalid
sfc0-f13sib11: SIB slot empty
sfc0-f13sib12: SIB slot empty
sfc0-f13sib13: SIB slot invalid
sfc0-f13sib14: SIB slot invalid
sfc0-f13sib15: SIB slot invalid

```

```
lcc0-re0:
```

```

-----
Port      Cable state      Module Type
lcc0-sib0:
0          MODULE_ABSENT    No Module
1          MODULE_ABSENT    No Module
2          CABLE_CONNECTED   CXP Module
3          CABLE_CONNECTED   CXP Module
4          MODULE_ABSENT    No Module
5          MODULE_ABSENT    No Module
6          MODULE_ABSENT    No Module
7          MODULE_ABSENT    No Module
lcc0-sib1:
0          MODULE_ABSENT    No Module
1          MODULE_ABSENT    No Module
2          CABLE_CONNECTED   CXP Module
3          CABLE_CONNECTED   CXP Module
4          MODULE_ABSENT    No Module
5          MODULE_ABSENT    No Module
6          MODULE_ABSENT    No Module
7          MODULE_ABSENT    No Module
lcc0-sib2:
0          MODULE_ABSENT    No Module
1          MODULE_ABSENT    No Module
2          CABLE_CONNECTED   CXP Module
3          CABLE_CONNECTED   CXP Module
4          MODULE_ABSENT    No Module
5          MODULE_ABSENT    No Module
6          MODULE_ABSENT    No Module
7          MODULE_ABSENT    No Module
lcc0-sib3:
0          MODULE_ABSENT    No Module
1          MODULE_ABSENT    No Module
2          CABLE_CONNECTED   CXP Module
3          CABLE_CONNECTED   CXP Module
4          MODULE_ABSENT    No Module
5          MODULE_ABSENT    No Module
6          MODULE_ABSENT    No Module
7          MODULE_ABSENT    No Module
lcc0-sib4: SIB slot empty

```

```
lcc4-re0:
```

```

-----
Port      Cable state      Module Type
lcc4-sib0:
0          MODULE_ABSENT    No Module

```

```

1      MODULE_ABSENT      No Module
2      MODULE_ABSENT      No Module
3      MODULE_ABSENT      No Module
4      CABLE_CONNECTED    CXP Module
5      CABLE_CONNECTED    CXP Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
lcc4-sib1:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      MODULE_ABSENT      No Module
3      MODULE_ABSENT      No Module
4      CABLE_CONNECTED    CXP Module
5      CABLE_CONNECTED    CXP Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
lcc4-sib2:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      MODULE_ABSENT      No Module
3      MODULE_ABSENT      No Module
4      CABLE_CONNECTED    CXP Module
5      CABLE_CONNECTED    CXP Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
lcc4-sib3:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      MODULE_ABSENT      No Module
3      MODULE_ABSENT      No Module
4      CABLE_CONNECTED    CXP Module
5      CABLE_CONNECTED    CXP Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
lcc4-sib4: SIB slot empty

lcc7-re0:
-----
Port    Cable state      Module Type
lcc7-sib0:
0      CABLE_CONNECTED  CXP Module
1      MODULE_ABSENT    No Module
2      MODULE_ABSENT    No Module
3      MODULE_ABSENT    No Module
4      MODULE_ABSENT    No Module
5      MODULE_ABSENT    No Module
6      CABLE_CONNECTED  CXP Module
7      MODULE_ABSENT    No Module
lcc7-sib1:
0      CABLE_CONNECTED  CXP Module
1      MODULE_ABSENT    No Module
2      MODULE_ABSENT    No Module
3      MODULE_ABSENT    No Module
4      MODULE_ABSENT    No Module
5      MODULE_ABSENT    No Module
6      CABLE_CONNECTED  CXP Module
7      MODULE_ABSENT    No Module
lcc7-sib2:
0      CABLE_CONNECTED  CXP Module
1      MODULE_ABSENT    No Module

```

```

2      MODULE_ABSENT      No Module
3      MODULE_ABSENT      No Module
4      MODULE_ABSENT      No Module
5      MODULE_ABSENT      No Module
6      CABLE_CONNECTED    CXP Module
7      MODULE_ABSENT      No Module
lcc7-sib3:
0      CABLE_CONNECTED    CXP Module
1      MODULE_ABSENT      No Module
2      MODULE_ABSENT      No Module
3      MODULE_ABSENT      No Module
4      MODULE_ABSENT      No Module
5      MODULE_ABSENT      No Module
6      CABLE_CONNECTED    CXP Module
7      MODULE_ABSENT      No Module
lcc7-sib4: SIB slot empty

```

### show chassis fabric optics (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric optics 0
```

```
sfc0-re0:
```

```

-----
Port      Cable state      Module Type
sfc0-f13sib0:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      CABLE_CONNECTED    CXP Module
3      CABLE_CONNECTED    CXP Module
4      MODULE_ABSENT      No Module
5      MODULE_ABSENT      No Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
8      CABLE_CONNECTED    CXP Module
9      MODULE_ABSENT      No Module
10     MODULE_ABSENT      No Module
11     MODULE_ABSENT      No Module
12     MODULE_ABSENT      No Module
13     MODULE_ABSENT      No Module
14     MODULE_ABSENT      No Module
15     MODULE_ABSENT      No Module

```

```
lcc0-re0:
```

```

-----
Port      Cable state      Module Type
lcc0-sib0:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      CABLE_CONNECTED    CXP Module
3      CABLE_CONNECTED    CXP Module
4      MODULE_ABSENT      No Module
5      MODULE_ABSENT      No Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module

```

```
lcc4-re0:
```

```

-----
Port      Cable state      Module Type
lcc4-sib0:
0      MODULE_ABSENT      No Module

```

```

1      MODULE_ABSENT      No Module
2      MODULE_ABSENT      No Module
3      MODULE_ABSENT      No Module
4      CABLE_CONNECTED    CXP Module
5      CABLE_CONNECTED    CXP Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module

```

```
lcc7-re0:
```

```

-----
Port      Cable state      Module Type
lcc7-sib0:
0          CABLE_CONNECTED  CXP Module
1          MODULE_ABSENT    No Module
2          MODULE_ABSENT    No Module
3          MODULE_ABSENT    No Module
4          MODULE_ABSENT    No Module
5          MODULE_ABSENT    No Module
6          CABLE_CONNECTED  CXP Module
7          MODULE_ABSENT    No Module

```

#### show chassis fabric optics sfc (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric optics sfc 0
```

```
sfc0-re0:
```

```

-----
Port      Cable state      Module Type
sfc0-f13sib0:
0          MODULE_ABSENT    No Module
1          MODULE_ABSENT    No Module
2          CABLE_CONNECTED  CXP Module
3          CABLE_CONNECTED  CXP Module
4          MODULE_ABSENT    No Module
5          MODULE_ABSENT    No Module
6          MODULE_ABSENT    No Module
7          MODULE_ABSENT    No Module
8          CABLE_CONNECTED  CXP Module
9          MODULE_ABSENT    No Module
10         MODULE_ABSENT    No Module
11         MODULE_ABSENT    No Module
12         MODULE_ABSENT    No Module
13         MODULE_ABSENT    No Module
14         MODULE_ABSENT    No Module
15         MODULE_ABSENT    No Module
sfc0-f13sib1:
0          MODULE_ABSENT    No Module
1          MODULE_ABSENT    No Module
2          MODULE_ABSENT    No Module
3          MODULE_ABSENT    No Module
4          CABLE_CONNECTED  CXP Module
5          CABLE_CONNECTED  CXP Module
6          MODULE_ABSENT    No Module
7          MODULE_ABSENT    No Module
8          MODULE_ABSENT    No Module
9          CABLE_CONNECTED  CXP Module
10         MODULE_ABSENT    No Module
11         MODULE_ABSENT    No Module
12         MODULE_ABSENT    No Module
13         MODULE_ABSENT    No Module

```

```

14      MODULE_ABSENT      No Module
15      CABLE_CONNECTED    CXP Module
sfc0-f13sib2: SIB slot invalid
sfc0-f13sib3:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      CABLE_CONNECTED    CXP Module
3      CABLE_CONNECTED    CXP Module
4      MODULE_ABSENT      No Module
5      MODULE_ABSENT      No Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
8      CABLE_CONNECTED    CXP Module
9      MODULE_ABSENT      No Module
10     MODULE_ABSENT      No Module
11     MODULE_ABSENT      No Module
12     MODULE_ABSENT      No Module
13     MODULE_ABSENT      No Module
14     MODULE_ABSENT      No Module
15     MODULE_ABSENT      No Module
sfc0-f13sib4:
sfc0-f13sib4:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      MODULE_ABSENT      No Module
3      MODULE_ABSENT      No Module
4      CABLE_CONNECTED    CXP Module
5      CABLE_CONNECTED    CXP Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
8      MODULE_ABSENT      No Module
9      CABLE_CONNECTED    CXP Module
10     MODULE_ABSENT      No Module
11     MODULE_ABSENT      No Module
12     MODULE_ABSENT      No Module
13     MODULE_ABSENT      No Module
14     MODULE_ABSENT      No Module
15     CABLE_CONNECTED    CXP Module
sfc0-f13sib5: SIB slot invalid
sfc0-f13sib6:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      CABLE_CONNECTED    CXP Module
3      CABLE_CONNECTED    CXP Module
4      MODULE_ABSENT      No Module
5      MODULE_ABSENT      No Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
8      CABLE_CONNECTED    CXP Module
9      MODULE_ABSENT      No Module
10     MODULE_ABSENT      No Module
11     MODULE_ABSENT      No Module
12     MODULE_ABSENT      No Module
13     MODULE_ABSENT      No Module
14     MODULE_ABSENT      No Module
15     MODULE_ABSENT      No Module
sfc0-f13sib7:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      MODULE_ABSENT      No Module

```

```

3      MODULE_ABSENT      No Module
4      CABLE_CONNECTED    CXP Module
5      CABLE_CONNECTED    CXP Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
8      MODULE_ABSENT      No Module
9      CABLE_CONNECTED    CXP Module
10     MODULE_ABSENT      No Module
11     MODULE_ABSENT      No Module
12     MODULE_ABSENT      No Module
13     MODULE_ABSENT      No Module
14     MODULE_ABSENT      No Module
15     CABLE_CONNECTED    CXP Module
sfc0-f13sib8:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      CABLE_CONNECTED    CXP Module
3      CABLE_CONNECTED    CXP Module
4      MODULE_ABSENT      No Module
5      MODULE_ABSENT      No Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
8      CABLE_CONNECTED    CXP Module
9      MODULE_ABSENT      No Module
10     MODULE_ABSENT      No Module
11     MODULE_ABSENT      No Module
12     MODULE_ABSENT      No Module
13     MODULE_ABSENT      No Module
14     MODULE_ABSENT      No Module
15     MODULE_ABSENT      No Module
sfc0-f13sib9:
0      MODULE_ABSENT      No Module
1      MODULE_ABSENT      No Module
2      MODULE_ABSENT      No Module
3      MODULE_ABSENT      No Module
4      CABLE_CONNECTED    CXP Module
5      CABLE_CONNECTED    CXP Module
6      MODULE_ABSENT      No Module
7      MODULE_ABSENT      No Module
8      MODULE_ABSENT      No Module
9      CABLE_CONNECTED    CXP Module
10     MODULE_ABSENT      No Module
11     MODULE_ABSENT      No Module
12     MODULE_ABSENT      No Module
13     MODULE_ABSENT      No Module
14     MODULE_ABSENT      No Module
15     CABLE_CONNECTED    CXP Module
sfc0-f13sib10: SIB slot invalid
sfc0-f13sib11: SIB slot empty
sfc0-f13sib12: SIB slot empty
sfc0-f13sib13: SIB slot invalid
sfc0-f13sib14: SIB slot invalid
sfc0-f13sib15: SIB slot invalid

```

### show chassis fabric optics lcc (TX Matrix Plus Router with 3D SIBs)

```

user@host> show chassis fabric topology lcc 7

lcc7-re0:
-----

```

Port	Cable state	Module Type
lcc7-sib0:		
0	CABLE_CONNECTED	CXP Module
1	MODULE_ABSENT	No Module
2	MODULE_ABSENT	No Module
3	MODULE_ABSENT	No Module
4	MODULE_ABSENT	No Module
5	MODULE_ABSENT	No Module
6	CABLE_CONNECTED	CXP Module
7	MODULE_ABSENT	No Module
lcc7-sib1:		
0	CABLE_CONNECTED	CXP Module
1	MODULE_ABSENT	No Module
2	MODULE_ABSENT	No Module
3	MODULE_ABSENT	No Module
4	MODULE_ABSENT	No Module
5	MODULE_ABSENT	No Module
6	CABLE_CONNECTED	CXP Module
7	MODULE_ABSENT	No Module
lcc7-sib2:		
0	CABLE_CONNECTED	CXP Module
1	MODULE_ABSENT	No Module
2	MODULE_ABSENT	No Module
3	MODULE_ABSENT	No Module
4	MODULE_ABSENT	No Module
5	MODULE_ABSENT	No Module
6	CABLE_CONNECTED	CXP Module
7	MODULE_ABSENT	No Module
lcc7-sib3:		
0	CABLE_CONNECTED	CXP Module
1	MODULE_ABSENT	No Module
2	MODULE_ABSENT	No Module
3	MODULE_ABSENT	No Module
4	MODULE_ABSENT	No Module
5	MODULE_ABSENT	No Module
6	CABLE_CONNECTED	CXP Module
7	MODULE_ABSENT	No Module
lcc7-sib4: SIB slot empty		



## show chassis fabric plane

<b>List of Syntax</b>	<a href="#">Syntax on page 1487</a> <a href="#">Syntax (TX Matrix Plus Router) on page 1487</a> <a href="#">Syntax (MX Series Routers) on page 1487</a> <a href="#">Syntax (MX2010, MX2020, MX10008, and MX2008 Universal Routing Platforms) on page 1487</a> <a href="#">Syntax (EX9253 Switches) on page 1487</a>
<b>Syntax</b>	show chassis fabric plane
<b>Syntax (TX Matrix Plus Router)</b>	show chassis fabric plane <detail   extensive   terse> <lcc <i>number</i>   sfc <i>number</i> >
<b>Syntax (MX Series Routers)</b>	show chassis fabric plane <extended> <detail   extensive   terse> <all-members> <local> <member <i>member-id</i> >
<b>Syntax (MX2010, MX2020, MX10008, and MX2008 Universal Routing Platforms)</b>	show chassis fabric plane
<b>Syntax (EX9253 Switches)</b>	show chassis fabric plane
<b>Release Information</b>	<p>Command introduced in Junos OS Release 8.0.</p> <p>Command introduced in Junos OS Release 9.4 for EX Series switches.</p> <p>detail, extensive, lcc, sfc, and terse options introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.</p> <p><b>extended</b> option introduced in Junos OS Release 16.1 for MX2020 and MX2010 Routers.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 18.2 for MX10008 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 18.2 for EX9253 Switches.</p>
<b>Description</b>	<p>(TX Matrix Plus router, T4000, T1600, M120, and MX Series routers and EX8200 switches only) On the M120 router, display the state of all fabric plane connections to the Forwarding Engine Boards (FEBs). On MX Series routers, display the state of all fabric plane connections to the Dense Port Concentrators (DPCs) and Packet Forwarding</p>

Engines (PFEs) on the Flexible PIC Concentrators (FPCs). On the TX Matrix Plus router, and on T1600 or T4000 routers in a routing matrix, display the state of the fabric management plane and the logical planes on the switch-fabric chassis (SFC) and line-card chassis (LCC). On EX8200 switches, display the state of all fabric planes. This command can be used on the master Routing Engine only.

**Options**    **none**—(MX2010, MX2020, and MX2008 Routers only) (Optional) Display the state of the fabric management plane.

**extended**—(MX2020, MX2010, and MX2008 Routers only) (Optional) Display the state of the fabric management planes (all 24 fabric planes).

**detail**—(TX Matrix Plus routers, T1600 or T4000 routers in a routing matrix, and MX Series routers only) (Optional) Display detailed output for the fabric management plane. Show Switch Interface Board (SIB) states for the TXP-F13 SIB and the TXP-F2S SIB.

**extensive**—(TX Matrix Plus routers, T1600 or T4000 routers in a routing matrix, and MX Series routers only) (Optional) Display extensive output for the fabric management plane.

**terse**—(TX Matrix Plus routers and MX Series routers only) (Optional) Display terse output for the fabric management plane.

**all-members**—(MX Series routers only) (Optional) Display the state of all fabric plane connections on all members of the Virtual Chassis configuration.

**lcc *number***—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers only) (Optional) Display the state of all fabric plane connections on the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Display the state of all fabric plane connections on the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

**sfc number**—(TX Matrix Plus router only) (Optional) Show information about the TX Matrix Plus router (SFC). Replace *number* with 0.

**Required Privilege Level** view

**Related Documentation**

- [request chassis fabric plane on page 852](#)
- [show chassis fabric plane-location on page 1542](#)
- [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

**List of Sample Output**

- [show chassis fabric plane \(M120 Router\) on page 1496](#)
- [show chassis fabric plane \(MX240 Router\) on page 1497](#)
- [show chassis fabric plane \(MX10008 Router\) on page 1498](#)
- [show chassis fabric plane \(MX480 Router\) on page 1500](#)
- [show chassis fabric plane \(MX960 Router\) on page 1501](#)
- [show chassis fabric plane \(MX240 with AS MLC Modular Carrier Card\) on page 1501](#)
- [show chassis fabric plane \(MX480 with AS MLC Modular Carrier Card\) on page 1502](#)
- [show chassis fabric plane \(MX480 Router with MPC4E\) on page 1503](#)
- [show chassis fabric plane \(MX960 with AS-MLC Modular Carrier Card\) on page 1506](#)
- [show chassis fabric plane \(MX2010 Router\) on page 1508](#)
- [show chassis fabric plane \(MX2020 Router\) on page 1512](#)
- [show chassis fabric plane \(MX2020 Router with MPC4E\) on page 1517](#)
- [show chassis fabric plane \(MX2020 Routers with SFB2\) on page 1519](#)
- [show chassis fabric plane \(MX2008\) on page 1523](#)
- [show chassis fabric plane \(TX Matrix Plus Router\) on page 1525](#)
- [show chassis fabric plane \(TX Matrix Plus Router with 3D SIBs\) on page 1525](#)
- [show chassis fabric plane detail \(TX Matrix Plus Router\) on page 1526](#)
- [show chassis fabric plane extensive \(TX Matrix Plus Router \) on page 1527](#)
- [show chassis fabric plane extensive \(TX Matrix Plus Router with 3D SIBs\) on page 1529](#)
- [show chassis fabric plane terse \(TX Matrix Plus Router\) on page 1531](#)
- [show chassis fabric plane terse \(TX Matrix Plus Router with 3D SIBs\) on page 1532](#)
- [show chassis fabric plane lcc \(TX Matrix Plus Router\) on page 1532](#)
- [show chassis fabric plane lcc \(TX Matrix Plus Router with 3D SIBs\) on page 1533](#)
- [show chassis fabric plane sfc \(TX Matrix Plus Router\) on page 1533](#)
- [show chassis fabric plane sfc \(TX Matrix Plus Router with 3D SIBs\) on page 1533](#)
- [show chassis fabric plane \(T1600 Router\) on page 1533](#)
- [show chassis fabric plane extensive \(T1600 Router\) on page 1534](#)
- [show chassis fabric plane detail \(T1600 Router\) on page 1536](#)
- [show chassis fabric plane \(EX8200 Switch\) on page 1537](#)
- [show chassis fabric plane \(EX9253 Switch\) on page 1537](#)

**Output Fields** [Table 127 on page 1490](#) lists the output fields for the **show chassis fabric plane** command. Output fields are listed in the approximate order in which they appear.

Table 127: show chassis fabric plane Output Fields

Field Name	Field Description	Level of output
Plane	(TX Matrix Plus, MX Series routers, M120 routers, and EX8200 switches only) Number of the plane.	none
Plane state	<p>(MX Series and M120 routers and EX8200 switches only) State of each plane:</p> <ul style="list-style-type: none"> <li>ACTIVE—SIB is operational and running.</li> </ul> <p><b>NOTE:</b> On the Enhanced MX SCB with MPCs, a maximum of 4 planes are operational and running. On all the other SCBs with MPCs, all the planes are operational and running.</p> <ul style="list-style-type: none"> <li>FAULTY— SIB is in alarmed state where the SIB's plane is not operational for the following reasons: <ul style="list-style-type: none"> <li>On-board fabric ASIC is not operational.</li> <li>Fiber optic connector faults.</li> <li>FPC connector faults.</li> <li>SIB midplane connector faults.</li> </ul> </li> </ul> <p>(MX2010, MX2020, MX10003, and MX2008 Routers only) State of each plane:</p> <ul style="list-style-type: none"> <li>ACTIVE—SFB is operational and running.</li> <li>OFFLINE— SFB is in offline.</li> </ul>	none
FEB	<p>(M120 routers only) FEB number and state of links to each FEB:</p> <ul style="list-style-type: none"> <li>Link error—Link between SIB and FPC is not operational.</li> <li>Links ok—Link between SIB and FPC is active.</li> <li>Unused—No FPC is present.</li> </ul>	none
FPC	(MX Series routers only) Slot number of each Dense Port Concentrator (DPC) or Flexible PIC Concentrator (FPC). An FPC occupies two DPC slots on an MX Series router. The interface corresponds to the lowest numbered DPC slot for which the FPC is installed.	none

Table 127: show chassis fabric plane Output Fields (continued)

Field Name	Field Description	Level of output
PFE	<p>(MX Series and M120 routers only) Slot number of each Packet Forwarding Engine and the state of the links to the DCP: <b>Links ok</b>, <b>Link error</b>, or <b>Unused</b>. Each DPC includes four Packet Forwarding Engines.</p> <ul style="list-style-type: none"> <li>• <b>Links ok</b>: Link between SIB and FPC is active.</li> <li>• <b>Link error</b>: Link between SIB and FPC is not operational.</li> <li>• <b>Unused</b>: No FPC is present.</li> </ul> <p>(On MX240 and MX480 routers with AS MLC modular carrier card and MPC4E only) Indicates that the link between the fabric plane and the hardware link on the modular carrier card or MPC4E is not operational.</p> <p>(MX2010, MX2020, and MX2008 routers only) Slot number of each Packet Forwarding Engine and the state of the links to the DPC: <b>Links ok</b>, <b>Link error</b>, or <b>Unused</b>. Each DPC includes four Packet Forwarding Engines.</p> <ul style="list-style-type: none"> <li>• <b>Links ok</b>: Link between SFB and FPC is active.</li> <li>• <b>Link error</b>: Link between SFB and FPC is not operational.</li> <li>• <b>Unused</b>: No FPC is present.</li> </ul>	none
State	<p>(TX Matrix Plus, and T1600 or T4000 routers in a routing matrix only)—State of the fabric plane:</p> <ul style="list-style-type: none"> <li>• <b>Online</b>: Fabric plane is operational and running and links on the SIB are operational.</li> <li>• <b>Offline</b>: Fabric plane state is <b>Offline</b> because the plane does not have four or more F2S and one F13 online.</li> <li>• <b>Empty</b>: Fabric plane state is <b>Empty</b> if all SIBs in the plane are absent.</li> <li>• <b>Spare</b>: Fabric plane is redundant and can be operational if the operational fabric plane encounters an error.</li> <li>• <b>Check</b>: Fabric plane is in alarmed state due to the following reason and the cause of the error must be resolved: <ul style="list-style-type: none"> <li>• One or more SIBs (belonging to the fabric plane) in the <b>Online</b> or <b>Spare</b> states has transitioned to the <b>Check</b> state. <b>Check</b> state of the SIB can be caused by link errors or destination errors.</li> </ul> </li> <li>• <b>Fault</b>: Fabric plane is in alarmed state if one or more SIBs belonging to the plane are in the <b>Fault</b> state. A SIB can be in the <b>Fault</b> state because of the following reasons: <ul style="list-style-type: none"> <li>• On-board fabric ASIC is not operational.</li> <li>• Fiber optic connector faults.</li> <li>• FPC connector faults.</li> <li>• SIB midplane connector faults.</li> <li>• Link errors have exceeded the threshold.</li> </ul> </li> </ul>	none
Link Errors	<p>(TX Matrix Plus routers with 3D SIBs only) indicate the number of links which are marked faulty because the errors on them have crossed threshold.</p>	none

Table 127: show chassis fabric plane Output Fields (continued)

Field Name	Field Description	Level of output
<b>Cable Errors</b>	(TX Matrix Plus routers with 3D SIBs only) Indicate the number of mandatory cables that are not connected, or in up state for that plane	none
<b>Destination Errors</b>	(TX Matrix Plus routers with 3D SIBs only) Indicates the number of destinations that are not reachable on this plane.	none
<b>Uptime</b>	(TX Matrix Plus, and T1600 or T4000 routers in a routing matrix only)—Time the fabric plane has been up and running.	none

#### Fabric Management Plane State Output Fields for the show chassis fabric plane extensive Command on a TX Matrix Plus Router

<b>PLANE <i>number</i></b>	<p>State of the fabric plane:</p> <ul style="list-style-type: none"> <li>• <b>Online:</b> Fabric plane is operational and running and links on the SIB are operational.</li> <li>• <b>Offline:</b> Fabric plane state is <b>Offline</b> because the plane does not have 4 or more F2S and 1 F13 online.</li> <li>• <b>Empty:</b> Fabric plane state is <b>Empty</b> if all SIBs in the plane are absent.</li> <li>• <b>Spare:</b> Fabric plane is redundant and can be operational if the operational fabric plane encounters an error.</li> <li>• <b>Check:</b> Fabric plane is in alarmed state due to the following reasons and the cause of the error must be resolved: <ul style="list-style-type: none"> <li>• One or more SIBs (belonging to the fabric plane) in the <b>Online</b> or <b>Spare</b> states has transitioned to the <b>Check</b> state. <b>Check</b> state of the SIB can be caused because of link errors or destination errors.</li> </ul> </li> <li>• <b>Fault:</b> Fabric plane is in alarmed state if one or more SIBs belonging to the plane are in the <b>Fault</b> state. A SIB can be in the <b>Fault</b> state because of the following reasons: <ul style="list-style-type: none"> <li>• On-board fabric ASIC is not operational.</li> <li>• Fiber optic connector faults.</li> <li>• FPC connector faults.</li> <li>• SIB midplane connector faults.</li> <li>• Link errors have exceeded the threshold.</li> </ul> </li> </ul>	<b>extensive</b>
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Table 127: show chassis fabric plane Output Fields (continued)

Field Name	Field Description	Level of output
<b>SIB F13/F2S slot-number</b>	<p>State of the TXP-F13 SIB or TXP-F2S SIB:</p> <ul style="list-style-type: none"> <li>• <b>Activating</b>—Transitional state when the SIB is transitioning to the <b>Online</b> or <b>Spare</b> state.</li> <li>• <b>Deactivating</b>—Transitional state when the SIB is going offline.</li> <li>• <b>Online</b>—SIB is operational and running.</li> <li>• <b>Offline</b>—SIB is powered down.</li> <li>• <b>Spare</b>—SIB is redundant and will move to active state if one of the working SIBs fails to pass traffic.</li> <li>• <b>Empty</b>—No SIB is present.</li> <li>• <b>Fault</b>—SIB is in alarmed state because of the following reasons and the cause of the error must be resolved: <ul style="list-style-type: none"> <li>• On-board fabric ASIC is not operational.</li> <li>• Fiber optic connector faults.</li> <li>• FPC connector faults.</li> <li>• SIB midplane connector faults.</li> <li>• Link errors have exceeded the threshold</li> </ul> </li> <li>• <b>Check</b>—SIB is in alarmed state where the SIB is partially operational because of link or destination errors. Only a SIB that is <b>Online</b> or <b>Spare</b> can transition to the <b>Check</b> state.</li> </ul> <p><b>NOTE:</b> If a SIB is not inserted properly, the SIB cannot transition to the <b>Online</b> or <b>Spare</b> state, and therefore cannot transition to the <b>Check</b> state.</p>	<b>extensive</b>
<b>SIB F13 slot-number Odd/Even</b>	<p>State of the TXP-F13 SIB even and odd port connection optical links from the TX Matrix Plus router (SFC) to the router (LCC) in the routing matrix. The left four ports on the SFC are labeled <b>Even</b> and provide connections to one even-numbered LCC—LCC0 or LCC2. The right four ports on the SFC are labeled <b>Odd</b> and provide connections to one odd-numbered LCC—LCC1 or LCC3.</p>	<b>extensive</b>
<b>LCC number, SIB slot-number</b>	<p>State of the SIB on the LCC that is connected to the <b>Even</b> or <b>Odd</b> port on the TXP-F13 SIB faceplate:</p> <ul style="list-style-type: none"> <li>• <b>Links ok</b>—Links between the TXP-F13 SIB on the SFC and the LCC are active.</li> <li>• <b>Links error</b>—One or more links between the TXP-F13 SIB on the SFC and the LCC, have experienced an error, but the affected links remain operational.</li> <li>• <b>Unused</b>—No SIB is present.</li> </ul>	<b>extensive</b>

Table 127: show chassis fabric plane Output Fields (continued)

Field Name	Field Description	Level of output
<b>SG number Port number</b>	State of the SG chip ports on the LCC: <ul style="list-style-type: none"> <li>• <b>Links ok</b>—Link is active.</li> <li>• <b>Link error</b>—Link is operational with errors.</li> <li>• <b>Link error crc saturated</b>—CRC has exceeded the rate threshold and reached saturation without optical issues—that is, a cable has not been cut, removed, or otherwise experienced an error.</li> <li>• <b>Link error crc saturated with optical errors</b>—CRC has exceeded the rate threshold and reached saturation with optical issues—that is, a cable has been cut, removed, or otherwise experienced an error.</li> <li>• <b>Unused</b>—Port is not in use.</li> </ul>	<b>extensive</b>
<b>SIB F2S slot-number</b>	State of the intra-chassis links between the TXP-F2S and TXP-F13 SIBs.	<b>extensive</b>

Fabric Management SIB State Output Fields for the show chassis fabric plane extensive Command on a TX Matrix Plus Router



Table 127: show chassis fabric plane Output Fields (continued)

Field Name	Field Description	Level of output
<b>SIB slot-number</b>	<p>State of the SIBs on the T1600/T4000 router (LCC) in the routing matrix:</p> <ul style="list-style-type: none"> <li>• <b>Activating</b>—Transitional state when the SIB is coming online.</li> <li>• <b>Deactivating</b>—Transitional state when the SIB is going offline.</li> <li>• <b>Connected</b>—SIBs on an LCC are connected and trained, but are either not online or are spare, because the plane on the the TX Matrix Plus router (SFC) is still offline. The LCC SIB transitions to the <b>Connected</b> state when the F13 SIB to which it connects is online but the SFC plane (to which the LCC SIB connects) is offline for some reason; for instance, when there are insufficient number of F2 SIBs in the plane.</li> <li>• <b>Disconnected</b>—If an F13 SIB on the TX Matrix Plus router (SFC) goes offline, then the SIBs on the LCCs connected to the F13 SIB get disconnected. On the TX Matrix Plus router with 3D SIBs, the LCC SIB is also disconnected if the F13 SIB is online, but none of the cables are connected or trained. The <b>Disconnected</b> state is valid only for SIBs on an LCC. An LCC SIB transitions to the <b>Disconnected</b> state when the F13 SIB to which it connects goes <b>Offline</b>, irrespective of the state of the SFC plane. <b>SFC Error</b>—If an F13 SIB on the TX Matrix Plus router (SFC) transitions to the <b>Fault</b> state (because of link errors, for instance), and if an LCC SIB connected to the F13 SIB comes online, the LCC SIB transitions to the <b>SFC Error</b> state. This state indicates that the F13 SIB to which the LCC SIB is connected has errors. <b>NOTE:</b> The <b>Connected</b>, <b>Disconnected</b>, and <b>SFC Error</b> states are applicable only to the SIBs on an LCC.</li> <li>• <b>Online</b>—SIB is operational and running.</li> <li>• <b>Offline</b>—SIB is powered down.</li> <li>• <b>Spare</b>—SIB is redundant and will move to active state if one of the working SIBs fails to pass traffic.</li> <li>• <b>Empty</b>—No SIB is present.</li> <li>• <b>Fault</b>—SIB is in alarmed state where the SIB's plane is not operational for the following reasons: <ul style="list-style-type: none"> <li>• On-board fabric ASIC is not operational.</li> <li>• Fiber optic connector faults.</li> <li>• FPC connector faults.</li> <li>• SIB midplane connector faults.</li> <li>• Link errors have exceeded the threshold</li> </ul> </li> <li>• <b>Check</b>—SIB is in alarmed state where the SIB is partially operational because of link or destination errors. Only a SIB that is <b>Online</b> or <b>Spare</b> can transition to the <b>Check</b> state. <b>NOTE:</b> If a SIB is not inserted properly, the SIB cannot transition to the <b>Online</b> or <b>Spare</b> state, and therefore cannot transition to the <b>Check</b> state.</li> </ul>	<b>extensive</b>

Table 127: show chassis fabric plane Output Fields (continued)

Field Name	Field Description	Level of output
<b>LCC SIB Link State</b>	State of the LCC SIB link: <ul style="list-style-type: none"> <li>• <b>Links ok</b>—Link is active.</li> <li>• <b>Links error</b>—A link error has occurred, but the link remains operational.</li> <li>• <b>Unused</b>—SIB is not in use.</li> </ul>	<b>extensive</b>
<b>SG number Port number</b>	State of the SG chip ports on the LCC: <ul style="list-style-type: none"> <li>• <b>Links ok</b>—Link is active.</li> <li>• <b>Link error</b>—Link is operational with errors.</li> <li>• <b>Link error crc saturated</b>—CRC has exceeded the rate threshold and reached saturation without optical issues—that is, a cable has not been cut, removed, or otherwise experienced an error.</li> <li>• <b>Link error crc saturated with optical errors</b>—CRC has exceeded the rate threshold and reached saturation with optical issues—that is, a cable has been cut, removed, or otherwise experienced an error.</li> <li>• <b>Unused</b>—Port is not in use.</li> </ul>	<b>extensive</b>

## Sample Output

### show chassis fabric plane (M120 Router)

```
user@host> show chassis fabric plane
```

```
Fabric management PLANE state
```

```
Plane 0
```

```
Plane state: ACTIVE
```

```
FEB 0: Links ok
```

```
FEB 1: Links ok
```

```
FEB 2: Links ok
```

```
FEB 3: Links ok
```

```
FEB 4: Links ok
```

```
FEB 5: Links ok
```

```
Plane 1
```

```
Plane state: ACTIVE
```

```
FEB 0: Links ok
```

```
FEB 1: Links ok
```

```
FEB 2: Links ok
```

```
FEB 3: Links ok
```

```
FEB 4: Links ok
```

```
FEB 5: Links ok
```

```
Plane 2
```

```
Plane state: ACTIVE
```

```
FEB 0: Links ok
```

```
FEB 1: Links ok
```

```
FEB 2: Links ok
```

```
FEB 3: Links ok
```

```
FEB 4: Links ok
```

```
FEB 5: Links ok
```

```
Plane 3
```

```
Plane state: ACTIVE
```

```

FEB 0: Links ok
FEB 1: Links ok
FEB 2: Links ok
FEB 3: Links ok
FEB 4: Links ok
FEB 5: Links ok

```

### show chassis fabric plane (MX240 Router)

```
user@host> show chassis fabric plane
```

```

Plane 0
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 1
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 2
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 3
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 4

```

```
Plane state: SPARE
  FPC 1
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
  FPC 2
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
Plane 5
  Plane state: SPARE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 6
  Plane state: SPARE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 7
  Plane state: SPARE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
```

### show chassis fabric plane (MX10008 Router)

```
user@host> show chassis fabric plane
```

```
Fabric management PLANE state
Plane 0
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
```

```
        PFE 3 :Links ok
        PFE 4 :Links ok
        PFE 5 :Links ok
    FPC 5
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
        PFE 4 :Links ok
        PFE 5 :Links ok
Plane 1
  Plane state: ACTIVE
  FPC 1
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
    PFE 4 :Links ok
    PFE 5 :Links ok
  FPC 5
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
    PFE 4 :Links ok
    PFE 5 :Links ok
Plane 2
  Plane state: ACTIVE
  FPC 1
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
    PFE 4 :Links ok
    PFE 5 :Links ok
  FPC 5
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
    PFE 4 :Links ok
    PFE 5 :Links ok
Plane 3
  Plane state: ACTIVE
  FPC 1
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
    PFE 4 :Links ok
    PFE 5 :Links ok
  FPC 5
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
    PFE 4 :Links ok
    PFE 5 :Links ok
```

### show chassis fabric plane (MX480 Router)

```
user@host> show chassis fabric plane
```

```
Fabric management PLANE state
```

```
Plane 0
```

```
Plane state: ACTIVE
```

```
FPC 1
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
PFE 2 :Links ok
```

```
PFE 3 :Links ok
```

```
Plane 1
```

```
Plane state: ACTIVE
```

```
FPC 1
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
PFE 2 :Links ok
```

```
PFE 3 :Links ok
```

```
Plane 2
```

```
Plane state: ACTIVE
```

```
FPC 1
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
PFE 2 :Links ok
```

```
PFE 3 :Links ok
```

```
Plane 3
```

```
Plane state: ACTIVE
```

```
FPC 1
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
PFE 2 :Links ok
```

```
PFE 3 :Links ok
```

```
Plane 4
```

```
Plane state: SPARE
```

```
FPC 1
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
PFE 2 :Links ok
```

```
PFE 3 :Links ok
```

```
Plane 5
```

```
Plane state: SPARE
```

```
FPC 1
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
PFE 2 :Links ok
```

```
PFE 3 :Links ok
```

```
Plane 6
```

```
Plane state: SPARE
```

```
FPC 1
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
PFE 2 :Links ok
```

```
PFE 3 :Links ok
```

```
Plane 7
```

```
Plane state: SPARE
```

```
FPC 1
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
PFE 2 :Links ok
```

```
PFE 3 :Links ok
```

**show chassis fabric plane (MX960 Router)**

```
user@host> show chassis fabric plane
```

```
Plane 0
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
Plane 1
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
Plane 2
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
Plane 3
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
```

**show chassis fabric plane (MX240 with AS MLC Modular Carrier Card)**

In the following output, FPC 1 is the AS MLC modular carrier card (AS MCC).

```
user@host>show chassis fabric plane
```

```
Fabric management PLANE state
Plane 0
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
    FPC 2
      PFE 0 :Links ok
Plane 1
  Plane state: ACTIVE
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
    FPC 2
      PFE 0 :Links ok
Plane 2
  Plane state: ACTIVE
    FPC 2
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 2 :Links ok
```

```

        FPC 5
          PFE 0 :Links ok
Plane 3
  Plane state: ACTIVE
    Plane state: ACTIVE
      FPC 1
        PFE 0 :Links ok
      FPC 2
        PFE 0 :Links ok
Plane 4
  Plane state: ACTIVE
    Plane state: ACTIVE
      FPC 1
        PFE 0 :Links ok
      FPC 2
        PFE 0 :Links ok
Plane 5
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Unused
    FPC 2
      PFE 0 :Links ok
Plane 6
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Links ok
    FPC 2
      PFE 0 :Links ok
Plane 7
  Plane state: ACTIVE
    FPC 1
      PFE 0 :Unused
    FPC 2
      PFE 0 :Links ok

```

### show chassis fabric plane (MX480 with AS MLC Modular Carrier Card)

In the following output, FPC 5 is the AS MLC modular carrier card (AS MCC).

```
user@host>show chassis fabric plane
```

```

Fabric management PLANE state
Plane 0
  Plane state: ACTIVE
    FPC 2
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 2 :Links ok
    FPC 5
      PFE 0 :Links ok
Plane 1
  Plane state: ACTIVE
    FPC 2
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 2 :Links ok
    FPC 5

```



```

        PFE 0 :Links ok
Plane 2
  Plane state: ACTIVE
    FPC 2
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 2 :Links ok
    FPC 5
      PFE 0 :Links ok
Plane 3
  Plane state: ACTIVE
    FPC 2
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 2 :Links ok
    FPC 5
      PFE 0 :Links ok
Plane 4
  Plane state: ACTIVE
    FPC 2
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 2 :Links ok
    FPC 5
      PFE 0 :Links ok
Plane 5
  Plane state: ACTIVE
    FPC 2
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 2 :Links ok
    FPC 5
      PFE 0 :Unused
Plane 6
  Plane state: ACTIVE
    FPC 2
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 2 :Links ok
    FPC 5
      PFE 0 :Links ok
Plane 7
  Plane state: ACTIVE
    FPC 2
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 2 :Links ok
    FPC 5
      PFE 0 :Unused

```

#### show chassis fabric plane (MX480 Router with MPC4E)

```
user@host > show chassis fabric plane
```

## Fabric management PLANE state

## Plane 0

Plane state: ACTIVE

## FPC 0

PFE 0 :Links ok

PFE 1 :Links ok

## FPC 1

PFE 0 :Links ok

PFE 1 :Links ok

PFE 2 :Links ok

PFE 3 :Links ok

## FPC 3

PFE 0 :Links ok

## FPC 4

PFE 0 :Links ok

PFE 1 :Links ok

## Plane 1

Plane state: ACTIVE

## FPC 0

PFE 0 :Links ok

PFE 1 :Links ok

## FPC 1

PFE 0 :Links ok

PFE 1 :Links ok

PFE 2 :Links ok

PFE 3 :Links ok

## FPC 3

PFE 0 :Links ok

## FPC 4

PFE 0 :Links ok

PFE 1 :Links ok

## Plane 2

Plane state: ACTIVE

## FPC 0

PFE 0 :Links ok

PFE 1 :Links ok

## FPC 1

PFE 0 :Links ok

PFE 1 :Links ok

PFE 2 :Links ok

PFE 3 :Links ok

## FPC 3

PFE 0 :Links ok

## FPC 4

PFE 0 :Links ok

PFE 1 :Links ok

## Plane 3

Plane state: ACTIVE

## FPC 0

PFE 0 :Links ok

PFE 1 :Links ok

## FPC 1

PFE 0 :Links ok

PFE 1 :Links ok

PFE 2 :Links ok

PFE 3 :Links ok

## FPC 3

PFE 0 :Links ok

## FPC 4

PFE 0 :Links ok

```
        PFE 1 :Links ok
Plane 4
  Plane state: SPARE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 3
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 1 :Links ok
Plane 5
  Plane state: SPARE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 3
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 1 :Links ok
Plane 6
  Plane state: SPARE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 3
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 1 :Links ok
Plane 7
  Plane state: SPARE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 3
      PFE 0 :Links ok
    FPC 4
```

```
PFE 0 :Links ok
PFE 1 :Links ok
```

### show chassis fabric plane (MX960 with AS-MLC Modular Carrier Card)

In the following output, FPC 1 is a modular carrier card.

```
user@host>show chassis fabric plane
```

Fabric management PLANE state

Plane 0

Plane state: ACTIVE

FPC 0

PFE 0 :Links ok

PFE 1 :Links ok

FPC 1

PFE 0 :Links ok

FPC 4

PFE 0 :Links ok

PFE 1 :Links ok

PFE 2 :Links ok

PFE 3 :Links ok

FPC 5

PFE 0 :Links ok

FPC 8

PFE 0 :Links ok

PFE 1 :Links ok

PFE 2 :Links ok

PFE 3 :Links ok

Plane 1

Plane state: ACTIVE

FPC 0

PFE 0 :Links ok

PFE 1 :Links ok

FPC 1

PFE 0 :Links ok

FPC 4

PFE 0 :Links ok

PFE 1 :Links ok

PFE 2 :Links ok

PFE 3 :Links ok

FPC 5

PFE 0 :Links ok

FPC 8

PFE 0 :Links ok

PFE 1 :Links ok

PFE 2 :Links ok

PFE 3 :Links ok

Plane 2

Plane state: ACTIVE

FPC 0

PFE 0 :Links ok

PFE 1 :Links ok

FPC 1

PFE 0 :Links ok

FPC 4

PFE 0 :Links ok

PFE 1 :Links ok

PFE 2 :Links ok

PFE 3 :Links ok

```
FPC 5
  PFE 0 :Links ok
FPC 8
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
Plane 3
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 1
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 5
      PFE 0 :Links ok
    FPC 8
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 4
  Plane state: SPARE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 1
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 5
      PFE 0 :Links ok
    FPC 8
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 5
  Plane state: SPARE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 1
      PFE 0 :Links ok
    FPC 4
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 5
      PFE 0 :Links ok
    FPC 8
```

```
PFE 0 :Links ok
PFE 1 :Links ok
PFE 2 :Links ok
PFE 3 :Links ok
```

### show chassis fabric plane (MX2010 Router)

```
user@host>show chassis fabric plane
```

```
Fabric management PLANE state
```

```
Plane 0
```

```
Plane state: ACTIVE
```

```
FPC 0
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
FPC 1
```

```
PFE 0 :Links ok
```

```
FPC 2
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
FPC 3
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
PFE 2 :Links ok
```

```
PFE 3 :Links ok
```

```
FPC 4
```

```
PFE 0 :Links ok
```

```
FPC 5
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
FPC 6
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
PFE 2 :Links ok
```

```
PFE 3 :Links ok
```

```
FPC 7
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
FPC 8
```

```
PFE 0 :Links ok
```

```
FPC 9
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
Plane 1
```

```
Plane state: ACTIVE
```

```
FPC 0
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
FPC 1
```

```
PFE 0 :Links ok
```

```
FPC 2
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
FPC 3
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
PFE 2 :Links ok
```

```
PFE 3 :Links ok
```

```
FPC 4
```

```
PFE 0 :Links ok
```

```
FPC 5
  PFE 0 :Links ok
  PFE 1 :Links ok
FPC 6
PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 7
  PFE 0 :Links ok
  PFE 1 :Links ok
FPC 8
  PFE 0 :Links ok
FPC 9
  PFE 0 :Links ok
  PFE 1 :Links ok
Plane 2
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 1
      PFE 0 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 3
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 4
      PFE 0 :Links ok
    FPC 5
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 6
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 7
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 8
      PFE 0 :Links ok
    FPC 9
      PFE 0 :Links ok
      PFE 1 :Links ok
Plane 3
  Plane state: OFFLINE
Plane 4
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 1
      PFE 0 :Links ok
    FPC 2
      PFE 0 :Links ok
```

```
PFE 1 :Links ok
  FPC 3
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
  FPC 4
    PFE 0 :Links ok
  FPC 5
    PFE 0 :Links ok
    PFE 1 :Links ok
  FPC 6
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
  FPC 7
    PFE 0 :Links ok
    PFE 1 :Links ok
  FPC 8
    PFE 0 :Links ok
  FPC 9
    PFE 0 :Links ok
    PFE 1 :Links ok
Plane 5
  Plane state: ACTIVE
  FPC 0
    PFE 0 :Links ok
    PFE 1 :Links ok
  FPC 1
    PFE 0 :Links ok
  FPC 2
    PFE 0 :Links ok
    PFE 1 :Links ok
  FPC 3
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
  FPC 4
    PFE 0 :Links ok
  FPC 5
    PFE 0 :Links ok
    PFE 1 :Links ok
  FPC 6
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
  FPC 7
    PFE 0 :Links ok
    PFE 1 :Links ok
  FPC 8
    PFE 0 :Links ok
  FPC 9
    PFE 0 :Links ok
  PFE 1 :Links ok
Plane 6
  Plane state: ACTIVE
  FPC 0
```



```
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 1
        PFE 0 :Links ok
    FPC 2
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 3
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 4
        PFE 0 :Links ok
    FPC 5
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 6
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 7
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 8
        PFE 0 :Links ok
    FPC 9
        PFE 0 :Links ok
        PFE 1 :Links ok
Plane 7
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 1
        PFE 0 :Links ok
    FPC 2
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 3
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 4
        PFE 0 :Links ok
    FPC 5
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 6
        PFE 0 :Links ok
    PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 7
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 8
        PFE 0 :Links ok
```

```
FPC 9
  PFE 0 :Links ok
  PFE 1 :Links ok
```

### show chassis fabric plane (MX2020 Router)

```
user@host>show chassis fabric plane
```

```
Fabric management PLANE state
```

```
Plane 0
```

```
Plane state: ACTIVE
```

```
FPC 0
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
```

```
FPC 1
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
```

```
FPC 2
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
```

```
FPC 3
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
```

```
FPC 4
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
```

```
FPC 5
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
```

```
FPC 6
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
```

```
FPC 7
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
```

```
FPC 8
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
```

```
FPC 9
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
```

```
    PFE 3 :Links ok
FPC 10
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 11
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 12
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 13
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 14
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 15
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 16
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 17
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 18
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
FPC 19
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
Plane 1
  Plane state: ACTIVE
  FPC 0
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
  FPC 1
    PFE 0 :Links ok
```

```
PFE 1 :Links ok
PFE 2 :Links ok
PFE 3 :Links ok
FPC 2
PFE 0 :Links ok
PFE 1 :Links ok
PFE 2 :Links ok
PFE 3 :Links ok
FPC 3
PFE 0 :Links ok
PFE 1 :Links ok
PFE 2 :Links ok
PFE 3 :Links ok
FPC 4
PFE 0 :Links ok
PFE 1 :Links ok
PFE 2 :Links ok
PFE 3 :Links ok
FPC 5
PFE 0 :Links ok
PFE 1 :Links ok
PFE 2 :Links ok
PFE 3 :Links ok
FPC 6
PFE 0 :Links ok
PFE 1 :Links ok
PFE 2 :Links ok
PFE 3 :Links ok
FPC 7
PFE 0 :Links ok
PFE 1 :Links ok
PFE 2 :Links ok
PFE 3 :Links ok
FPC 8
PFE 0 :Links ok
PFE 1 :Links ok
PFE 2 :Links ok
PFE 3 :Links ok
FPC 9
PFE 0 :Links ok
PFE 1 :Links ok
PFE 2 :Links ok
PFE 3 :Links ok
FPC 10
PFE 0 :Links ok
PFE 1 :Links ok
PFE 2 :Links ok
PFE 3 :Links ok
FPC 11
PFE 0 :Links ok
PFE 1 :Links ok
PFE 2 :Links ok
PFE 3 :Links ok
FPC 12
PFE 0 :Links ok
PFE 1 :Links ok
PFE 2 :Links ok
PFE 3 :Links ok
FPC 13
PFE 0 :Links ok
```

```
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 14
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 15
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 16
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 17
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 18
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 19
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
Plane 2
Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 2
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 3
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 4
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
```

```
FPC 5
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 6
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 7
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 8
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 9
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 10
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 11
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 12
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 13
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 14
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 15
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 16
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
```

```

FPC 17
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 18
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
FPC 19
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
Plane 3
...
```

### show chassis fabric plane (MX2020 Router with MPC4E)

```
user@host > show chassis fabric plane
```

```
Fabric management PLANE state
```

```
Plane 0
```

```
Plane state: ACTIVE
```

```
FPC 0
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
FPC 9
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
FPC 10
```

```
PFE 0 :Links ok
```

```
FPC 14
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
FPC 19
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
PFE 2 :Links ok
```

```
PFE 3 :Links ok
```

```
Plane 1
```

```
Plane state: ACTIVE
```

```
FPC 0
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
FPC 9
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
FPC 10
```

```
PFE 0 :Links ok
```

```
FPC 14
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
FPC 19
```

```
PFE 0 :Links ok
```

```
PFE 1 :Links ok
```

```
PFE 2 :Links ok
```

```
PFE 3 :Links ok
```

```
Plane 2
```

```
Plane state: ACTIVE
  FPC 0
    PFE 0 :Links ok
    PFE 1 :Links ok
  FPC 9
    PFE 0 :Links ok
    PFE 1 :Links ok
  FPC 10
    PFE 0 :Links ok
  FPC 14
    PFE 0 :Links ok
    PFE 1 :Links ok
  FPC 19
    PFE 0 :Links ok
    PFE 1 :Links ok
    PFE 2 :Links ok
    PFE 3 :Links ok
Plane 3
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 9
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 10
      PFE 0 :Links ok
    FPC 14
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 19
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 4
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 9
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 10
      PFE 0 :Links ok
    FPC 14
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 19
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 5
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 9
      PFE 0 :Links ok
```



```

        PFE 1 :Links ok
    FPC 10
        PFE 0 :Links ok
    FPC 14
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 19
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
Plane 6
  Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 9
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 10
        PFE 0 :Links ok
    FPC 14
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 19
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
Plane 7
  Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 9
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 10
        PFE 0 :Links ok
    FPC 14
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 19
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok

```

### show chassis fabric plane (MX2020 Routers with SFB2)

```

user@host> show chassis fabric plane

Fabric management PLANE state
Plane 0
  Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok

```

```
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 2
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 3
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 6
        PFE 0 :Links ok
    FPC 7
        PFE 0 :Links ok
    FPC 11
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 12
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 13
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 18
        PFE 0 :Links ok
    FPC 19
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
Plane 1
  Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
    PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 2
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 3
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 6
        PFE 0 :Links ok
    FPC 7
        PFE 0 :Links ok
    FPC 11
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 12
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 13
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 18
        PFE 0 :Links ok
    FPC 19
        PFE 0 :Links ok
```

```
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
Plane 2
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 3
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 6
      PFE 0 :Links ok
    FPC 7
      PFE 0 :Links ok
    FPC 11
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 12
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 13
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 18
      PFE 0 :Links ok
    FPC 19
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    ...
Plane 18
  Plane state: OFFLINE
Plane 19
  Plane state: OFFLINE
Plane 20
  Plane state: OFFLINE
Plane 21
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 3
      PFE 0 :Links ok
      PFE 1 :Links ok
```

```
FPC 6
  PFE 0 :Links ok
FPC 7
  PFE 0 :Links ok
FPC 11
  PFE 0 :Links ok
  PFE 1 :Links ok
FPC 12
  PFE 0 :Links ok
  PFE 1 :Links ok
FPC 13
  PFE 0 :Links ok
  PFE 1 :Links ok
FPC 18
  PFE 0 :Links ok
FPC 19
  PFE 0 :Links ok
  PFE 1 :Links ok
  PFE 2 :Links ok
  PFE 3 :Links ok
Plane 22
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
    FPC 2
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 3
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 6
      PFE 0 :Links ok
    FPC 7
      PFE 0 :Links ok
    FPC 11
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 12
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 13
      PFE 0 :Links ok
      PFE 1 :Links ok
    FPC 18
      PFE 0 :Links ok
    FPC 19
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
      PFE 3 :Links ok
Plane 23
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
    FPC 1
```

```

        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 2
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 3
        PFE 0 :Links ok
PFE 1 :Links ok
    FPC 6
        PFE 0 :Links ok
    FPC 7
        PFE 0 :Links ok
    FPC 11
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 12
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 13
        PFE 0 :Links ok
        PFE 1 :Links ok
    FPC 18
        PFE 0 :Links ok
    FPC 19
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok

```

### show chassis fabric plane (MX2008)

```
user@host> show chassis fabric plane
```

```

Fabric management PLANE state
Plane 0
    Plane state: OFFLINE
Plane 1
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 3
        PFE 0 :Links ok
    FPC 5
        PFE 0 :Links ok
Plane 2
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok

```

```
        PFE 3 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 3
        PFE 0 :Links ok
    FPC 5
        PFE 0 :Links ok
Plane 3
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 3
        PFE 0 :Links ok
    FPC 5
        PFE 0 :Links ok
Plane 4
    Plane state: OFFLINE
Plane 5
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 3
        PFE 0 :Links ok
    FPC 5
        PFE 0 :Links ok
Plane 6
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
        PFE 3 :Links ok
    FPC 3
        PFE 0 :Links ok
    FPC 5
        PFE 0 :Links ok
```

```
Plane 7
Plane state: OFFLINE
```

### show chassis fabric plane (TX Matrix Plus Router)

```
user@host> show chassis fabric plane
```

```
sfc0-re0:
```

Plane	State	Link errors	Destination errors	Uptime
0	Spare	NONE	NONE	
1	Online	NONE	NONE	10 hours, 16 seconds
2	Online	NONE	NONE	10 hours, 13 seconds
3	Online	NONE	NONE	10 hours, 9 seconds
4	Online	NONE	NONE	10 hours, 7 seconds

```
lcc0-re0:
```

SIB	State	Link errors	Destination errors	Uptime
0	Spare	NONE	NONE	
1	Online	NONE	NONE	10 hours, 16 seconds
2	Online	NONE	NONE	10 hours, 13 seconds
3	Online	NONE	NONE	10 hours, 9 seconds
4	Online	NONE	NONE	10 hours, 7 seconds

```
lcc2-re0:
```

SIB	State	Link errors	Destination errors	Uptime
0	Spare	NONE	NONE	
1	Online	NONE	NONE	10 hours, 16 seconds
2	Online	NONE	NONE	10 hours, 12 seconds
3	Online	NONE	NONE	10 hours, 9 seconds
4	Online	NONE	NONE	10 hours, 7 seconds

### show chassis fabric plane (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric plane
```

```
sfc0-re0:
```

Plane	State	Cable errors	Link errors	Destination errors	Uptime
0	Spare	NONE	NONE	NONE	
1	Online	NONE	NONE	NONE	5 hours, 11 minutes, 3 seconds
2	Online	NONE	NONE	NONE	8 hours, 4 minutes, 24 seconds
3	Online	NONE	NONE	NONE	8 hours, 3 minutes, 16 seconds
4	Online	NONE	NONE	NONE	8 hours, 2 minutes, 12 seconds

```
lcc2-re0:
```

SIB	State	Cable errors	Link errors	Destination errors	Uptime
0	Spare	NONE	NONE	NONE	
1	Online	NONE	NONE	NONE	5 hours, 11 minutes, 3 seconds
2	Online	NONE	NONE	NONE	8 hours, 4 minutes, 57 seconds
3	Online	NONE	NONE	NONE	8 hours, 3 minutes

```

minutes, 53 seconds
4    Online      NONE      NONE      NONE      8 hours, 2
minutes, 45 seconds

lcc4-re0:
-----
SIB   State      Cable errors  Link errors  Destination errors  Uptime
0     Spare      NONE         NONE         NONE                5 hours, 11
1     Online     NONE         NONE         NONE                minutes, 12 seconds
2     Online     NONE         NONE         NONE                8 hours, 4
minutes, 24 seconds
3     Online     NONE         NONE         NONE                8 hours, 3
minutes, 16 seconds
4     Online     NONE         NONE         NONE                8 hours, 2
minutes, 12 seconds

lcc5-re0:
-----
SIB   State      Cable errors  Link errors  Destination errors  Uptime
0     Spare      NONE         NONE         NONE                5 hours, 11
1     Online     NONE         NONE         NONE                minutes, 12 seconds
2     Online     NONE         NONE         NONE                8 hours, 4
minutes, 24 seconds
3     Online     NONE         NONE         NONE                8 hours, 3
minutes, 15 seconds
4     Online     NONE         NONE         NONE                8 hours, 2
minutes, 11 seconds

```

### show chassis fabric plane detail (TX Matrix Plus Router)

```
user@host> show chassis fabric plane detail
```

```

sfc0-re0:
-----
Fabric Management PLANE State:
PLANE 0:   Spare
  SIB F13 0 :   Spare
  SIB F13 1 :   Empty
  SIB F2S 0/0 :  Spare
  SIB F2S 0/2 :  Spare
  SIB F2S 0/4 :  Spare
  SIB F2S 0/6 :  Spare
PLANE 1:   Online
  SIB F13 3 :   Online
  SIB F13 4 :   Empty
  SIB F2S 1/0 :  Online
  SIB F2S 1/2 :  Online
  SIB F2S 1/4 :  Online
  SIB F2S 1/6 :  Online
PLANE 2:   Online
  SIB F13 6 :   Online
  SIB F13 7 :   Empty
  SIB F2S 2/0 :  Online
  SIB F2S 2/2 :  Online
  SIB F2S 2/4 :  Online
  SIB F2S 2/6 :  Online
PLANE 3:   Online
  SIB F13 8 :   Online

```



```

SIB F13 9 : Online
SIB F2S 3/0 : Online
SIB F2S 3/2 : Online
SIB F2S 3/4 : Online
SIB F2S 3/6 : Online
PLANE 4: Online
SIB F13 11 : Online
SIB F13 12 : Online
SIB F2S 4/0 : Online
SIB F2S 4/2 : Online
SIB F2S 4/4 : Online
SIB F2S 4/6 : Online

```

lcc0-re0:

-----  
Fabric Management SIB State:

```

SIB 0 : Spare
SIB 1 : Online
SIB 2 : Online
SIB 3 : Online
SIB 4 : Online

```

lcc1-re0:

-----  
Fabric Management SIB State:

```

SIB 0 : Spare
SIB 1 : Online
SIB 2 : Online
SIB 3 : Online
SIB 4 : Online

```

...

### show chassis fabric plane extensive (TX Matrix Plus Router )

user@host> show chassis fabric plane extensive

sfc0-re0:

-----  
Fabric Management PLANE State:

PLANE 0: Spare

```

SIB F13 0 : Spare
SIB F13 1 : Empty
SIB F2S 0/0 : Spare
SIB F2S 0/2 : Spare
SIB F2S 0/4 : Spare
SIB F2S 0/6 : Spare

```

SIB F13 0 Even:

LCC 0, SIB 0 : Links ok

SG 0

```

Port 0 : Links ok
Port 1 : Links ok
Port 2 : Links ok
Port 3 : Links ok

```

SG 1

```

Port 0 : Links ok
Port 1 : Links ok
Port 2 : Links ok
Port 3 : Links ok

```

SG 2

```

Port 0 : Links ok

```

```

        Port 1 : Links ok
        Port 2 : Links ok
        Port 3 : Links ok
    SG 3
        Port 0 : Links ok
        Port 1 : Links ok
        Port 2 : Links ok
        Port 3 : Links ok
SIB F13 0 Odd:
    LCC 1, SIB 0 : Links ok
    SG 0
        Port 0 : Links ok
        Port 1 : Links ok
        Port 2 : Links ok
        Port 3 : Links ok
    SG 1
        Port 0 : Links ok
        Port 1 : Links ok
        Port 2 : Links ok
        Port 3 : Links ok
    SG 2
        Port 0 : Links ok
        Port 1 : Links ok
        Port 2 : Links ok
        Port 3 : Links ok
    SG 3
        Port 0 : Links ok
        Port 1 : Links ok
        Port 2 : Links ok
        Port 3 : Links ok
    SIB F2S 0/0: Links ok
    SIB F2S 0/2: Links ok
    SIB F2S 0/4: Links ok
    SIB F2S 0/6: Links ok
SIB F13 1 Even:
    LCC 2, SIB 0 : Unused
    SG 0
        Port 0 : Unused
        Port 1 : Unused
        Port 2 : Unused
        Port 3 : Unused
    SG 1
        Port 0 : Unused
        Port 1 : Unused
        Port 2 : Unused
        Port 3 : Unused
    SG 2
        Port 0 : Unused
        Port 1 : Unused
        Port 2 : Unused
        Port 3 : Unused
    SG 3
        Port 0 : Unused
        Port 1 : Unused
        Port 2 : Unused
        Port 3 : Unused
SIB F13 1 Odd:
    LCC 3, SIB 0 : Unused
    SG 0
        Port 0 : Unused
```

```

Port 1 : Unused
Port 2 : Unused
Port 3 : Unused
SG 1
Port 0 : Unused
Port 1 : Unused
Port 2 : Unused
Port 3 : Unused
SG 2
Port 0 : Unused
Port 1 : Unused
Port 2 : Unused
Port 3 : Unused
SG 3
Port 0 : Unused
Port 1 : Unused
Port 2 : Unused
Port 3 : Unused
SIB F2S 0/0: Unused
SIB F2S 0/2: Unused
SIB F2S 0/4: Unused
SIB F2S 0/6: Unused
PLANE 1: Online
SIB F13 3 : Online
SIB F13 4 : Empty
SIB F2S 1/0 : Online
SIB F2S 1/2 : Online
SIB F2S 1/4 : Online
SIB F2S 1/6 : Online
SIB F13 3 Even:
...

```

### show chassis fabric plane extensive (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric plane extensive
```

```
sfc0-re0:
```

```
-----
Fabric Management PLANE State:
```

```

PLANE 0: Online
SIB F13 0 : Empty
SIB F13 1 : Online
SIB F2S 0/0 : Online
SIB F2S 0/2 : Online
SIB F2S 0/4 : Online
SIB F2S 0/6 : Online
SIB F13 0
LCC 0, SIB 0 : Unused
PFE 0 : Unused
PFE 1 : Unused
PFE 2 : Unused
PFE 3 : Unused
PFE 4 : Unused
PFE 5 : Unused
PFE 6 : Unused
PFE 7 : Unused
PFE 8 : Unused
PFE 9 : Unused
PFE 10 : Unused
PFE 11 : Unused

```

```

        PFE 12 : Unused
        PFE 13 : Unused
        PFE 14 : Unused
        PFE 15 : Unused
    LCC 1, SIB 0 : Unused
        PFE 0 : Unused
        PFE 1 : Unused
        PFE 2 : Unused
        PFE 3 : Unused
        PFE 4 : Unused
        PFE 5 : Unused
        PFE 6 : Unused
        PFE 7 : Unused
        PFE 8 : Unused
        PFE 9 : Unused
        PFE 10 : Unused
        PFE 11 : Unused
        PFE 12 : Unused
        PFE 13 : Unused
        PFE 14 : Unused
        PFE 15 : Unused
    LCC 2, SIB 0 : Unused
        PFE 0 : Unused
        PFE 1 : Unused
        PFE 2 : Unused
        PFE 3 : Unused
        PFE 4 : Unused
        PFE 5 : Unused
        PFE 6 : Unused
        PFE 7 : Unused
        PFE 8 : Unused
        PFE 9 : Unused
        PFE 10 : Unused
    ...
lcc5-re0:
-----
Fabric Management SIB State:
  SIB 0 : Online
    LCC SIB Link State : Links ok
      PFE 0 : Links ok
      PFE 1 : Links ok
      PFE 2 : Links ok
      PFE 3 : Links ok
      PFE 4 : Links ok
      PFE 5 : Links ok
      PFE 6 : Links ok
      PFE 7 : Links ok
      PFE 8 : Links ok
      PFE 9 : Links ok
      PFE 10 : Links ok
      PFE 11 : Links ok
      PFE 12 : Links ok
      PFE 13 : Links ok
      PFE 14 : Links ok
      PFE 15 : Links ok
    FPC 1
      PFE 0 : Links ok
    FPC 2
      PFE 0 : Links ok
    FPC 3
```

```

        PFE 0      : Links ok
        PFE 1      : Links ok
    FPC 4
        PFE 0      : Links ok
SIB    1      : Online
LCC SIB Link State : Links ok
    PFE 0      : Links ok
    PFE 1      : Links ok
    PFE 2      : Links ok
    PFE 3      : Links ok
    PFE 4      : Links ok
    PFE 5      : Links ok
    PFE 6      : Links ok
    PFE 7      : Links ok
    PFE 8      : Links ok
    PFE 9      : Links ok
    PFE 10     : Links ok
    PFE 11     : Links ok
    PFE 12     : Links ok
    PFE 13     : Links ok
    PFE 14     : Links ok
    PFE 15     : Links ok
    FPC 1
        PFE 0      : Links ok
    FPC 2
        PFE 0      : Links ok
    FPC 3
        PFE 0      : Links ok
        PFE 1      : Links ok
    FPC 4
        PFE 0      : Links ok

```

### show chassis fabric plane terse (TX Matrix Plus Router)

```
user@host> show chassis fabric plane terse
```

```
sfc0-re0:
```

Plane	State	Link errors	Destination errors	Uptime
0	Spare	NONE	NONE	
1	Online	NONE	NONE	18 minutes, 37 seconds
2	Online	NONE	NONE	18 minutes, 36 seconds
3	Online	NONE	NONE	18 minutes, 33 seconds
4	Online	NONE	NONE	18 minutes, 31 seconds

```
lcc1-re0:
```

SIB	State	Link errors	Destination errors	Uptime
0	Spare	NONE	NONE	
1	Online	NONE	NONE	18 minutes, 37 seconds
2	Online	NONE	NONE	
3	Online	NONE	NONE	
4	Empty	NONE	NONE	

```
lcc2-re0:
```

SIB	State	Link errors	Destination errors	Uptime
0	Spare	NONE	NONE	
1	Online	NONE	NONE	18 minutes, 37 seconds
2	Online	NONE	NONE	18 minutes, 36 seconds
3	Online	NONE	NONE	18 minutes, 32 seconds
4	Online	NONE	NONE	18 minutes, 31 seconds

### show chassis fabric plane terse (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric plane terse
```

```
sfc0-re0:
```

Plane	State	Cable errors	Link errors	Destination errors	Uptime
0	Offline	NONE	NONE	NONE	
1	Online	NONE	NONE	NONE	1 day, 18 hours, 14 minutes, 26 seconds
2	Offline	NONE	NONE	NONE	
3	Offline	NONE	NONE	NONE	
4	Offline	NONE	NONE	NONE	

```
lcc2-re0:
```

SIB	State	Cable errors	Link errors	Destination errors	Uptime
0	Offline	NONE	NONE	NONE	
1	Online	NONE	NONE	NONE	1 day, 18 hours, 17 minutes
2	Offline	NONE	NONE	NONE	
3	Offline	NONE	NONE	NONE	
4	Offline	NONE	NONE	NONE	

```
lcc4-re0:
```

SIB	State	Cable errors	Link errors	Destination errors	Uptime
0	Offline	NONE	NONE	NONE	
1	Online	NONE	NONE	NONE	1 day, 18 hours, 14 minutes, 38 seconds
2	Offline	NONE	NONE	NONE	
3	Offline	NONE	NONE	NONE	
4	Offline	NONE	NONE	NONE	

```
lcc5-re0:
```

SIB	State	Cable errors	Link errors	Destination errors	Uptime
0	Offline	NONE	NONE	NONE	
1	Online	NONE	NONE	NONE	1 day, 18 hours, 14 minutes, 34 seconds
2	Offline	NONE	NONE	NONE	
3	Offline	NONE	NONE	NONE	
4	Offline	NONE	NONE	NONE	

### show chassis fabric plane lcc (TX Matrix Plus Router)

```
user@host> show chassis fabric plane lcc 1
```

```
lcc1-re0:
```

SIB	State	Link errors	Destination errors	Uptime
0	Spare	NONE	NONE	
1	Online	NONE	NONE	25 minutes, 17 seconds
2	Disconnected	NONE	NONE	
3	Disconnected	NONE	NONE	
4	Empty	NONE	NONE	

### show chassis fabric plane lcc (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric plane lcc 2
```

```
lcc2-re0:
```

SIB	State	Cable errors	Link errors	Destination errors	Uptime
0	Offline	NONE	NONE	NONE	
1	Online	NONE	NONE	NONE	1 day, 18 hours, 16 minutes, 44 seconds
2	Offline	NONE	NONE	NONE	
3	Offline	NONE	NONE	NONE	
4	Offline	NONE	NONE	NONE	

### show chassis fabric plane sfc (TX Matrix Plus Router)

```
user@host> show chassis fabric plane sfc 0
```

```
sfc0-re0:
```

Plane	State	Link errors	Destination errors	Uptime
0	Spare	NONE	NONE	
1	Online	NONE	NONE	27 minutes, 7 seconds
2	Online	NONE	NONE	27 minutes, 6 seconds
3	Online	NONE	NONE	27 minutes, 3 seconds
4	Online	NONE	NONE	27 minutes, 1 second

### show chassis fabric plane sfc (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric plane sfc 0
```

```
sfc0-re0:
```

Plane	State	Cable errors	Link errors	Destination errors	Uptime
0	Offline	NONE	NONE	NONE	
1	Online	NONE	NONE	NONE	1 day, 18 hours, 14 minutes, 20 seconds
2	Offline	NONE	NONE	NONE	
3	Offline	NONE	NONE	NONE	
4	Offline	NONE	NONE	NONE	

### show chassis fabric plane (T1600 Router)

```
user@host> show chassis fabric plane
```

Plane	State	Uptime
0	Online	15 hours, 42 minutes, 9 seconds
1	Online	15 hours, 42 minutes, 9 seconds
2	Fault	
3	Online	15 hours, 42 minutes, 9 seconds
4	Online	15 hours, 42 minutes, 9 seconds

### show chassis fabric plane extensive (T1600 Router)

```
user@host> show chassis fabric plane extensive
```

```
Fabric Management PLANE State:
```

```
PLANE 0: Online
```

```
ST-SIB-L 0: Links ok
```

```
SG 0
```

```
Port 0 : Links ok
Port 1 : Links ok
Port 2 : Links ok
Port 3 : Links ok
```

```
SG 1
```

```
Port 0 : Links ok
Port 1 : Links ok
Port 2 : Links ok
Port 3 : Links ok
```

```
SG 2
```

```
Port 0 : Links ok
Port 1 : Links ok
Port 2 : Links ok
Port 3 : Links ok
```

```
SG 3
```

```
Port 0 : Links ok
Port 1 : Links ok
Port 2 : Links ok
Port 3 : Links ok
```

```
ST-SIB-L 0
```

```
FPC 4
```

```
PFE 0: Links ok
PFE 1: Links ok
```

```
FPC 6
```

```
PFE 0: Links ok
PFE 1: Links ok
```

```
FPC 7
```

```
PFE 0: Links ok
```

```
PLANE 1: Online
```

```
ST-SIB-L 1: Links ok
```

```
SG 0
```

```
Port 0 : Links ok
Port 1 : Links ok
Port 2 : Links ok
Port 3 : Links ok
```

```
SG 1
```

```
Port 0 : Links ok
Port 1 : Links ok
Port 2 : Links ok
Port 3 : Links ok
```

```
SG 2
```

```
Port 0 : Links ok
Port 1 : Links ok
Port 2 : Links ok
Port 3 : Links ok
```



```

SG 3
  Port 0    : Links ok
  Port 1    : Links ok
  Port 2    : Links ok
  Port 3    : Links ok
ST-SIB-L 1
  FPC 4
    PFE 0: Links ok
    PFE 1: Links ok
  FPC 6
    PFE 0: Links ok
    PFE 1: Links ok
  FPC 7
    PFE 0: Links ok
PLANE 2:    Online
ST-SIB-L 2: Links ok
SG 0
  Port 0    : Links ok
  Port 1    : Links ok
  Port 2    : Links ok
  Port 3    : Links ok
SG 1
  Port 0    : Links ok
  Port 1    : Links ok
  Port 2    : Links ok
  Port 3    : Links ok
SG 2
  Port 0    : Links ok
  Port 1    : Links ok
  Port 2    : Links ok
  Port 3    : Links ok
SG 3
  Port 0    : Links ok
  Port 1    : Links ok
  Port 2    : Links ok
  Port 3    : Links ok
ST-SIB-L 2
  FPC 4
    PFE 0: Links ok
    PFE 1: Links ok
  FPC 6
    PFE 0: Links ok
    PFE 1: Links ok
  FPC 7
    PFE 0: Links ok
PLANE 3:    Spare
ST-SIB-L 3: Links ok
SG 0
  Port 0    : Links ok
  Port 1    : Links ok
  Port 2    : Links ok
  Port 3    : Links ok
SG 1
  Port 0    : Links ok
  Port 1    : Links ok
  Port 2    : Links ok
  Port 3    : Links ok
SG 2
  Port 0    : Links ok
  Port 1    : Links ok

```

```

        Port 2      : Links ok
        Port 3      : Links ok
    SG 3
        Port 0      : Links ok
        Port 1      : Links ok
        Port 2      : Links ok
        Port 3      : Links ok
    ST-SIB-L 3
    FPC 4
        PFE 0: Links ok
        PFE 1: Links ok
    FPC 6
        PFE 0: Links ok
        PFE 1: Links ok
    FPC 7
        PFE 0: Links ok
    PLANE 4:    Online
    ST-SIB-L 4: Links ok
    SG 0
        Port 0      : Links ok
        Port 1      : Links ok
        Port 2      : Links ok
        Port 3      : Links ok
    SG 1
        Port 0      : Links ok
        Port 1      : Links ok
        Port 2      : Links ok
        Port 3      : Links ok
    SG 2
        Port 0      : Links ok
        Port 1      : Links ok
        Port 2      : Links ok
        Port 3      : Links ok
    SG 3
        Port 0      : Links ok
        Port 1      : Links ok
        Port 2      : Links ok
        Port 3      : Links ok
    ST-SIB-L 4
    FPC 4
        PFE 0: Links ok
        PFE 1: Links ok
    FPC 6
        PFE 0: Links ok
        PFE 1: Links ok
    FPC 7
        PFE 0: Links ok

```

#### show chassis fabric plane detail (T1600 Router)

```
user@host> show chassis fabric plane detail
```

```

Fabric Management PLANE State:
PLANE 0:    Online
PLANE 1:    Online
PLANE 2:    Online
PLANE 3:    Spare
PLANE 4:    Online

```

**show chassis fabric plane (EX8200 Switch)**

```
user@host> show chassis fabric plane
```

```
Fabric management PLANE state
Plane 0
  Plane state: ACTIVE
Plane 1
  Plane state: ACTIVE
Plane 2
  Plane state: ACTIVE
Plane 3
  Plane state: ACTIVE
Plane 4
  Plane state: SPARE
Plane 5
  Plane state: SPARE
Plane 6
  Plane state: SPARE
Plane 7
  Plane state: SPARE
Plane 8
  Plane state: ACTIVE
Plane 9
  Plane state: ACTIVE
Plane 10
  Plane state: ACTIVE
Plane 11
  Plane state: ACTIVE
```

**show chassis fabric plane (EX9253 Switch)**

```
user@switch> show chassis fabric plane
```

```
Fabric management PLANE state
Plane 0
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
Plane 1
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
    FPC 1
      PFE 0 :Links ok
      PFE 1 :Links ok
      PFE 2 :Links ok
Plane 2
  Plane state: ACTIVE
    FPC 0
      PFE 0 :Links ok
      PFE 1 :Links ok
```

```
        PFE 2 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
Plane 3
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
Plane 4
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
Plane 5
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
Plane 6
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
Plane 7
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
Plane 8
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
```

```
        PFE 2 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
Plane 9
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
Plane 10
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
Plane 11
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
Plane 12
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
Plane 13
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
Plane 14
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
```

```
        PFE 2 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
Plane 15
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
Plane 16
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
Plane 17
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
Plane 18
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
Plane 19
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
Plane 20
    Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
```

```
        PFE 2 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
Plane 21
  Plane state: ACTIVE
    FPC 0
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
    FPC 1
        PFE 0 :Links ok
        PFE 1 :Links ok
        PFE 2 :Links ok
```

## show chassis fabric plane-location

---

- List of Syntax**
- [Syntax on page 1542](#)
  - [Syntax \(MX Series Routers\) on page 1542](#)
  - [Syntax \(MX2010, MX2020, MX10003, and MX2008 Universal Routing Platforms\) on page 1542](#)
  - [Syntax \(TX Matrix Plus Router\) on page 1542](#)
  - [Syntax \(QFX Switches\) on page 1542](#)
  - [Syntax \(EX9253 Switches\) on page 1542](#)
  - [Syntax \(EX9253 Switches\) on page 1542](#)

<b>Syntax</b>	show chassis fabric plane-location
---------------	------------------------------------

<b>Syntax (MX Series Routers)</b>	show chassis fabric plane-location <all-members> <local> <member <i>member-id</i> >
-----------------------------------	--

<b>Syntax (MX2010, MX2020, MX10003, and MX2008 Universal Routing Platforms)</b>	show chassis fabric plane-location <extended>
---	--

<b>Syntax (TX Matrix Plus Router)</b>	show chassis fabric plane-location
---------------------------------------	------------------------------------

<b>Syntax (QFX Switches)</b>	show chassis fabric plane-location
------------------------------	------------------------------------

<b>Syntax (EX9253 Switches)</b>	show chassis fabric plane-location
---------------------------------	------------------------------------

<b>Syntax (EX9253 Switches)</b>	show chassis fabric plane-location
---------------------------------	------------------------------------

<b>Release Information</b>	<p>Command introduced in Junos OS Release 8.0.</p> <p>Command introduced in Junos OS Release 9.4 for EX Series switches.</p> <p>Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 15.1X53-D30 for QFX Series switches.</p> <p><b>extended</b> option introduced in Junos OS Release 16.1R1 for MX2020 and MX2010 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p>
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Command introduced in Junos OS Release 17.2 for PTX10008 Routers.

Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.

Command introduced in Junos OS Release 18.2 for MX10008 Universal Routing Platforms.

Command introduced in Junos OS Release 18.2 for EX9253 Switches.

**Description** (M120, MX Series routers, and EX8200 switches only) Display the Control Board (CB) location of each plane. This command can be used on the master Routing Engine or the backup Routing Engine. For information about the meaning of “CBs” and “fabric plane” on the switches, see the hardware documentation for your switch.

(TX Matrix Plus routers only) Display the SIB location of each fabric plane.

(PTX Series Packet Transport Routers and QFX Series switches only) Display the fabric plane location of each SIB.

(MX2010, MX2020, and MX2008 Routers only) Display the fabric plane location of each Switch Fabric Board (SFB).

**Options** **all-members**—(MX Series routers only) (Optional) Display the CB location of each fabric plane on the Routing Engines in all member routers in the Virtual Chassis configuration.

**local**—(MX Series routers only) (Optional) Display the CB location of each fabric plane on the Routing Engines in the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Display the CB location of each fabric plane on the Routing Engines in the specified member in the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

**extended**—(MX2020, MX2010, and MX2008 routers only) (Optional) Display the fabric plane location of all 3 planes of each Switch Fabric Board (SFB) or enhanced Switch Fabric Board (SFB2).

**Required Privilege Level** view

**List of Sample Output**

- [show chassis fabric plane-location \(M120 Router\) on page 1544](#)
- [show chassis fabric plane-location \(MX240 and MX480 Routers\) on page 1545](#)
- [show chassis fabric plane-location \(MX960 Router\) on page 1545](#)
- [show chassis fabric plane-location \(MX10008 Router\) on page 1545](#)
- [show chassis fabric plane-location \(MX2010 Router\) on page 1546](#)
- [show chassis fabric plane-location \(MX2020 Router\) on page 1546](#)
- [show chassis fabric plane-location \(MX2020 Router with SFB2\) on page 1546](#)
- [show chassis fabric plane-location \(MX2008 Router\) on page 1547](#)
- [show chassis fabric plane-location \(MX10003 Router\) on page 1547](#)
- [show chassis fabric plane-location \(TX Matrix Plus Router\) on page 1548](#)
- [show chassis fabric plane-location \(TX Matrix Plus Router with 3D SIBs\) on page 1548](#)
- [show chassis fabric plane-location \(EX8200 Switch\) on page 1548](#)
- [show chassis fabric plane-location \(EX9253 Switch\) on page 1549](#)
- [show chassis fabric plane-location \(EX9253 Switch\) on page 1550](#)

[show chassis fabric plane-location \(PTX Series Packet Transport Routers\) on page 1551](#)

[show chassis fabric plane-location \(PTX10008 Routers\) on page 1551](#)

[show chassis fabric plane-location \(QFX 10008 Switch\) on page 1552](#)

**Output Fields** Table 128 on page 1544 lists the output fields for the **show chassis fabric plane-location** command. Output fields are listed in the approximate order in which they appear.

*Table 128: show chassis fabric plane-location Output Fields*

Field Name	Field Description
Plane <i>n</i>	Plane number.  (PTX Series Packet Transport Routers and QFX Series switches) Plane numbers associated with the SIB.  (MX2010, MX2020, and MX2008 Routers only) Plane numbers associated with the SFB.
Control Board <i>n</i>	Control board number.
SFC ABS-SIB-F13	(TX Matrix Plus routers only) Switch Interface Board (SIB) slot number on the F13 SIB.
SFC ABS-SIB-F2S	(TX Matrix Plus routers only) SIB slot number on the F2S SIB.
LCC ST-SIB-L	(TX Matrix Plus routers only) Line-card chassis (LCC) SIB slot number.
SFC SIB F13	(TX Matrix Plus routers with 3D SIBs only) Switch Interface Board (SIB) slot number on the F13 SIB.
SFC SIB F2S	(TX Matrix Plus routers with 3D SIBs only) SIB slot number on the F2S SIB.
LCC SIB	(TX Matrix Plus routers with 3D SIBs only) Line-card chassis (LCC) SIB slot number.
SIB	(PTX Series Packet Transport Routers and QFX Series switches) SIB number.
Switch Fabric Board <i>n</i>	(MX2010, MX2020, and MX2008 Routers only) SFB number.

## Sample Output

### [show chassis fabric plane-location \(M120 Router\)](#)

```

user@host> show chassis fabric plane-location
-----Fabric Plane Locations-----
Plane 0          Control Board 0
Plane 1          Control Board 0
Plane 2          Control Board 1
Plane 3          Control Board 1

```

**show chassis fabric plane-location (MX240 and MX480 Routers)**

```
user@host> show chassis fabric plane-location

-----Fabric Plane Locations-----
Plane 0                Control Board 0
Plane 1                Control Board 0
Plane 2                Control Board 0
Plane 3                Control Board 0
Plane 4                Control Board 1
Plane 5                Control Board 1
Plane 6                Control Board 1
Plane 7                Control Board 1
```

**show chassis fabric plane-location (MX960 Router)**

```
user@host> show chassis fabric plane-location

-----Fabric Plane Locations-----
Plane 0                Control Board 0
Plane 1                Control Board 0
Plane 2                Control Board 1
Plane 3                Control Board 1
Plane 4                Control Board 2
Plane 5                Control Board 2
```

**show chassis fabric plane-location (MX10008 Router)**

```
user@host> show chassis fabric plane-location

-----Fabric Plane Locations-----
Plane 0                Switch Fabric Board 0
Plane 1                Switch Fabric Board 0
Plane 2                Switch Fabric Board 0
Plane 3                Switch Fabric Board 0
Plane 4                Switch Fabric Board 1
Plane 5                Switch Fabric Board 1
Plane 6                Switch Fabric Board 1
Plane 7                Switch Fabric Board 1
Plane 8                Switch Fabric Board 2
Plane 9                Switch Fabric Board 2
Plane 10               Switch Fabric Board 2
Plane 11               Switch Fabric Board 2
Plane 12               Switch Fabric Board 3
Plane 13               Switch Fabric Board 3
Plane 14               Switch Fabric Board 3
Plane 15               Switch Fabric Board 3
Plane 16               Switch Fabric Board 4
Plane 17               Switch Fabric Board 4
Plane 18               Switch Fabric Board 4
Plane 19               Switch Fabric Board 4
Plane 20               Switch Fabric Board 5
Plane 21               Switch Fabric Board 5
Plane 22               Switch Fabric Board 5
Plane 23               Switch Fabric Board 5
```

### show chassis fabric plane-location (MX2010 Router)

```
user@host> show chassis fabric plane-location

-----Fabric Plane Locations-----
Plane 0          Switch Fabric Board 0
Plane 1          Switch Fabric Board 1
Plane 2          Switch Fabric Board 2
Plane 3          Switch Fabric Board 3
Plane 4          Switch Fabric Board 4
Plane 5          Switch Fabric Board 5
Plane 6          Switch Fabric Board 6
Plane 7          Switch Fabric Board 7
```

### show chassis fabric plane-location (MX2020 Router)

```
user@host> show chassis fabric plane-location

-----Fabric Plane Locations-----
Plane 0          Switch Fabric Board 0
Plane 1          Switch Fabric Board 1
Plane 2          Switch Fabric Board 2
Plane 3          Switch Fabric Board 3
Plane 4          Switch Fabric Board 4
Plane 5          Switch Fabric Board 5
Plane 6          Switch Fabric Board 6
Plane 7          Switch Fabric Board 7
```

### show chassis fabric plane-location (MX2020 Router with SFB2)

```
user@host> show chassis fabric plane-location extended

-----Fabric Plane Locations-----
Plane 0          Switch Fabric Board 0
Plane 1          Switch Fabric Board 0
Plane 2          Switch Fabric Board 0
Plane 3          Switch Fabric Board 1
Plane 4          Switch Fabric Board 1
Plane 5          Switch Fabric Board 1
Plane 6          Switch Fabric Board 2
Plane 7          Switch Fabric Board 2
Plane 8          Switch Fabric Board 2
Plane 9          Switch Fabric Board 3
Plane 10         Switch Fabric Board 3
Plane 11         Switch Fabric Board 3
Plane 12         Switch Fabric Board 4
Plane 13         Switch Fabric Board 4
Plane 14         Switch Fabric Board 4
Plane 15         Switch Fabric Board 5
Plane 16         Switch Fabric Board 5
Plane 17         Switch Fabric Board 5
Plane 18         Switch Fabric Board 6
Plane 19         Switch Fabric Board 6
Plane 20         Switch Fabric Board 6
Plane 21         Switch Fabric Board 7
Plane 22         Switch Fabric Board 7
Plane 23         Switch Fabric Board 7
```

**show chassis fabric plane-location (MX2008 Router)**

```

user@host> show chassis fabric plane-location

-----Fabric Plane Locations-----
Plane 0          Switch Fabric Board 0
Plane 1          Switch Fabric Board 1
Plane 2          Switch Fabric Board 2
Plane 3          Switch Fabric Board 3
Plane 4          Switch Fabric Board 4
Plane 5          Switch Fabric Board 5
Plane 6          Switch Fabric Board 6
Plane 7          Switch Fabric Board 7

```

**show chassis fabric plane-location (MX10003 Router)**

```

user@host> show chassis fabric plane-location

-----Fabric Plane Locations-----
Plane 0
    FPC 0
    FPC 1
Plane 1
    FPC 0
    FPC 1
Plane 2
    FPC 0
    FPC 1
Plane 3
    FPC 0
    FPC 1
Plane 4
    FPC 0
    FPC 1
Plane 5
    FPC 0
    FPC 1
Plane 6
    FPC 0
    FPC 1
Plane 7
    FPC 0
    FPC 1
Plane 8
    FPC 0
    FPC 1
Plane 9
    FPC 0
    FPC 1
Plane 10
    FPC 0
    FPC 1
Plane 11
    FPC 0
    FPC 1
Plane 12
    FPC 0
    FPC 1
Plane 13

```

```

        FPC 0
        FPC 1
Plane 14
        FPC 0
        FPC 1
Plane 15
        FPC 0
        FPC 1
Plane 16
        FPC 0
        FPC 1
Plane 17
        FPC 0
        FPC 1
Plane 18
        FPC 0
        FPC 1
Plane 19
        FPC 0
        FPC 1
Plane 20
        FPC 0
        FPC 1
Plane 21
        FPC 0
        FPC 1

```

#### show chassis fabric plane-location (TX Matrix Plus Router)

```
user@host> show chassis fabric plane-location
```

```

Fabric Plane Locations :
Plane      SFC ABS-SIB-F13      SFC ABS-SIB-F2      LCC ST-SIB-L
0           0, 1                0/0, 0/2, 0/4, 0/6      0
1           3, 4                1/0, 1/2, 1/4, 1/6      1
2           6, 7                2/0, 2/2, 2/4, 2/6      2
3           8, 9                3/0, 3/2, 3/4, 3/6      3
4          11, 12              4/0, 4/2, 4/4, 4/6      4

```

#### show chassis fabric plane-location (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric plane-location
```

```
sfc0-re0
```

```

-----Fabric Plane Locations-----
Plane      SFC SIB F13      SFC SIB F2      LCC SIB
0           0, 1                0/0, 0/2, 0/4, 0/6      0
1           3, 4                1/0, 1/2, 1/4, 1/6      1
2           6, 7                2/0, 2/2, 2/4, 2/6      2
3           8, 9                3/0, 3/2, 3/4, 3/6      3
4          11, 12              4/0, 4/2, 4/4, 4/6      4

```

#### show chassis fabric plane-location (EX8200 Switch)

```
user@host> show chassis fabric plane-location
```

```

-----Fabric Plane Locations-----
Plane  0                      Control Board 0

```

Plane 1	Control Board 0
Plane 2	Control Board 0
Plane 3	Control Board 0
Plane 4	Control Board 1
Plane 5	Control Board 1
Plane 6	Control Board 1
Plane 7	Control Board 1
Plane 8	Control Board 2
Plane 9	Control Board 2
Plane 10	Control Board 2
Plane 11	Control Board 2

### show chassis fabric plane-location (EX9253 Switch)

```
user@switch> show chassis fabric plane-location
```

```
-----Fabric Plane Locations-----
Plane 0
    FPC 0
    FPC 1
Plane 1
    FPC 0
    FPC 1
Plane 2
    FPC 0
    FPC 1
Plane 3
    FPC 0
    FPC 1
Plane 4
    FPC 0
    FPC 1
Plane 5
    FPC 0
    FPC 1
Plane 6
    FPC 0
    FPC 1
Plane 7
    FPC 0
    FPC 1
Plane 8
    FPC 0
    FPC 1
Plane 9
    FPC 0
    FPC 1
Plane 10
    FPC 0
    FPC 1
Plane 11
    FPC 0
    FPC 1
Plane 12
    FPC 0
    FPC 1
Plane 13
    FPC 0
    FPC 1
Plane 14
```

```

        FPC 0
        FPC 1
Plane 15
        FPC 0
        FPC 1
Plane 16
        FPC 0
        FPC 1
Plane 17
        FPC 0
        FPC 1
Plane 18
        FPC 0
        FPC 1
Plane 19
        FPC 0
        FPC 1
Plane 20
        FPC 0
        FPC 1
Plane 21
        FPC 0
        FPC 1
```

#### show chassis fabric plane-location (EX9253 Switch)

```
user@switch> show chassis fabric plane-location
```

```

-----Fabric Plane Locations-----
Plane 0
        FPC 0
        FPC 1
Plane 1
        FPC 0
        FPC 1
Plane 2
        FPC 0
        FPC 1
Plane 3
        FPC 0
        FPC 1
Plane 4
        FPC 0
        FPC 1
Plane 5
        FPC 0
        FPC 1
Plane 6
        FPC 0
        FPC 1
Plane 7
        FPC 0
        FPC 1
Plane 8
        FPC 0
        FPC 1
Plane 9
        FPC 0
        FPC 1
Plane 10
```



```

        FPC 0
        FPC 1
Plane 11
        FPC 0
        FPC 1
Plane 12
        FPC 0
        FPC 1
Plane 13
        FPC 0
        FPC 1
Plane 14
        FPC 0
        FPC 1
Plane 15
        FPC 0
        FPC 1
Plane 16
        FPC 0
        FPC 1
Plane 17
        FPC 0
        FPC 1
Plane 18
        FPC 0
        FPC 1
Plane 19
        FPC 0
        FPC 1
Plane 20
        FPC 0
        FPC 1
Plane 21
        FPC 0
        FPC 1

```

### show chassis fabric plane-location (PTX Series Packet Transport Routers)

```
user@host> show chassis fabric plane-location
```

```

-----Fabric Plane Locations-----
SIB          Planes
0            0    1
1            2    3
2            4    5
3            6    7
4            8    9
5           10   11
6           12   13
7           14   15
8           16   17

```

### show chassis fabric plane-location (PTX10008 Routers)

```
user@host> show chassis fabric plane-location
```

```

-----Fabric Plane Locations-----
SIB          Planes
0            0    1

```

1	2	3
2	4	5
3	6	7
4	8	9
5	10	11

#### show chassis fabric plane-location (QFX 10008 Switch)

```
user@host> show chassis fabric plane-location
```

```
-----Fabric Plane Locations-----  
SIB      Planes  
0         0  1  
1         2  3  
2         4  5  
3         6  7  
4         8  9  
5        10 11
```

## show chassis fabric redundancy-mode

<b>Syntax</b>	show chassis fabric redundancy-mode
<b>Release Information</b>	Command introduced in Junos OS Release 12.2.
<b>Description</b>	(MX240, MX480, and MX960 routers only) Display whether redundancy mode is configured for active control boards to enable increased fabric bandwidth usage.
<b>Options</b>	This command has no options.
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Detection and Corrective Actions of Line Cards with Degraded Fabric on MX Series Routers on page 140</a></li> <li>• <a href="#">Detection and Recovery of Fabric-Related Failures Caused by Loss of Connectivity on MX Series Routers on page 135</a></li> <li>• <a href="#">MX Series Routers Fabric Resiliency on page 138</a></li> <li>• <a href="#">redundancy-mode on page 761</a></li> <li>• <a href="#">Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 145</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">show chassis fabric redundancy-mode on page 1553</a>
<b>Output Fields</b>	<a href="#">Table 129 on page 1553</a> lists the output fields for the <b>show chassis fabric redundancy-mode</b> command. Output fields are listed in the approximate order in which they appear.

*Table 129: show chassis fabric redundancy mode Output Fields*

Field name	Field Description
Fabric redundancy mode	Currently configured mode of the fabric

## Sample Output

### show chassis fabric redundancy-mode

```
user@host> show chassis fabric redundancy-mode
Fabric redundancy mode: Redundant Fabric
```

## show chassis fabric reachability

---

<b>Syntax</b>	<b>show chassis fabric reachability</b> <detail> <extended>
<b>Release Information</b>	<p>Command introduced before Junos OS Release 11.4.</p> <p>Command introduced in Junos OS Release 12.1 for MX240, MX480, and MX960 routers.</p> <p>Command introduced in Junos OS Release 18.2 for MX10008 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Switches.</p> <p>Command introduced in Junos OS Release 13.1R3 for TX Matrix routers.</p> <p><b>extended</b> option introduced in Junos OS Release 16.1R1 for MX2010 and MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.2 for PTX10008 Routers.</p>
<b>Description</b>	(M320, MX240, MX480, MX960, and T Series routers only) Display the current state of fabric destination reachability. Additionally, display the details of the automated actions taken by the system to stop blackholing and attempt healing, and the final resolution of the actions.
<b>Options</b>	<p><b>none</b>—Display the state of fabric destination reachability for M320, MX240, MX480, MX960, T640, T1600, and TX Matrix routers, based on periodic reachability checks. Display the system's action phase sequences to stop the black hole and attempt healing, and the final resolution.</p> <p><b>detail</b>—(Optional) Display the details of the actions carried out by the system in the different action phases and the final resolution.</p> <p><b>extended</b>—(MX2020 and MX2010 Routers only) (Optional) Display the state of fabric destination reachability for MX2010 and MX2020 routers.</p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">show chassis fabric unreachable-destinations on page 1622</a></li></ul>
<b>List of Sample Output</b>	<p><a href="#">show chassis fabric reachability (T640 and T1600 routers) on page 1558</a></p> <p><a href="#">show chassis fabric reachability detail (T640 and T1600 routers) on page 1558</a></p> <p><a href="#">show chassis fabric reachability (PTX5000 system) on page 1559</a></p> <p><a href="#">show chassis fabric reachability (PTX10008 Router) on page 1559</a></p> <p><a href="#">show chassis fabric reachability (MX2020 Router with SFB2) on page 1560</a></p> <p><a href="#">show chassis fabric reachability detail (MX10003 Router) on page 1560</a></p> <p><a href="#">show chassis fabric reachability (TX Matrix router) on page 1560</a></p> <p><a href="#">show chassis fabric reachability detail (TX Matrix router) on page 1560</a></p> <p><a href="#">show chassis fabric reachability detail (MX960 router) on page 1561</a></p>

**Output Fields** The table lists the output fields for the **show chassis fabric reachability** command. Output fields are listed in the approximate order in which they appear.

*Table 130: show chassis fabric reachability Output Fields*

Field Name	Field Description	Level of Output
Fabric reachability status	Display the reachability status of the fabric. <ul style="list-style-type: none"> <li>• <b>Enabled destinations transitioned to unreachable, Fabric down action in progress</b>—Some enabled destinations that were originally reachable have become unreachable. The system is trying to stop the fabric down condition and attempt healing.</li> <li>• <b>Enabled destinations reachable</b>—The enabled destinations are reachable.</li> <li>• <b>Unreachable destinations healed</b>—The unreachable destinations are healed and are reachable.</li> <li>• <b>Unreachable destinations removed</b>—The unreachable destinations are removed.</li> <li>• <b>Unreachable destinations present</b>—Unreachable destinations are present in the system.</li> <li>• <b>Unreachable destinations present due to FPC restart disable configuration</b>—Unreachable destinations are present as a result of user configuration set to disable FPC restart.</li> </ul>	All levels
Unreachable destinations	Number of FPCs that have unreachable destinations.	All levels
Detected on	Date and time when unreachable destinations are detected.	All levels
Reason	Reason for the destination turning unreachable. <ul style="list-style-type: none"> <li>• <b>Single FPC error</b>—A single bad FPC is not reachable over the fabric.</li> <li>• <b>Fabric plane error</b>—Multiple FPCs are not able to forward traffic over the fabric planes.</li> </ul>	All levels
Fabric reachability action	Action taken to handle the unreachable destination. <ul style="list-style-type: none"> <li>• <b>Plane Action</b>—The healing is attempted only for the fabric planes.</li> <li>• <b>SIB Action</b>—(PTX Series system only) The healing is attempted only for the SIBs.</li> <li>• <b>Plane and FPC Action</b>—The healing is attempted both for the fabric planes and the FPCs.</li> <li>• <b>SIB and FPC Action</b>—(PTX Series system only) The healing is attempted both for the SIBs and the FPCs.</li> <li>• <b>FPC Action</b>—The healing is attempted only for the bad FPCs.</li> </ul>	All levels
Acting on	Current action is being performed on: <ul style="list-style-type: none"> <li>• <b>Single FPC error</b>—The current operation is for healing the single bad FPC.</li> <li>• <b>Fabric Plane error</b>—The current operation is for healing the fabric planes.</li> </ul>	All levels

Table 130: show chassis fabric reachability Output Fields (continued)

Field Name	Field Description	Level of Output
Initial phase	Starting phase for the healing action. <ul style="list-style-type: none"> <li>• <b>Plane restart</b>—The fabric planes are restarted.</li> <li>• <b>SIB restart</b>—(PTX Series system only) The SIBs are restarted.</li> <li>• <b>Plane and FPC restart</b>—Both the fabric planes and affected FPCs are restarted.</li> <li>• <b>SIB and FPC restart</b>—(PTX Series system only) SIBs and affected FPCs are restarted.</li> </ul>	All levels
Current phase	Current phase for the healing action. <ul style="list-style-type: none"> <li>• <b>Plane restart</b>—The fabric planes are restarted.</li> <li>• <b>SIB restart</b>—(PTX Series system only) The SIBs are restarted.</li> <li>• <b>Plane and FPC restart</b>—Both the fabric planes and affected FPCs are restarted.</li> <li>• <b>SIB and FPC restart</b>—(PTX Series system only) Both the SIBs and affected FPCs are restarted.</li> <li>• <b>FPC offline</b>—The FPCs are turned offline because the previously mentioned healing processes have failed.</li> </ul>	All levels
Action started	Date and time when the system fabric down healing attempt is started.	All levels
Plane restart phase	The status of the plane restart phase. <ul style="list-style-type: none"> <li>• <b>Completed</b>—The plane restart phase is completed.</li> <li>• <b>In progress</b>—The plane restart phase is in progress.</li> </ul>	detail
Phase started	Date and time when the plane restart phase is started.	detail
Planes restarted	List of plane numbers restarted by the system.	detail
Planes timed out	List of plane numbers that have timed out waiting to be restarted by the system.	detail
Planes being offlined / onlined	Planes that are turned offline or turned online by the system, with date and time.	detail
Phase completed	Date and time when the plane restart phase is completed.	detail
Plane and FPC Restart Phase	Status of the plane and FPC restart phase. <ul style="list-style-type: none"> <li>• <b>Completed</b>—The plane and FPC restart phase is completed.</li> <li>• <b>In progress</b>—The plane and FPC restart phase is in progress.</li> </ul>	detail
Phase started	Date and time when the plane and FPC restart phase is started.	detail
FPC Offline Started	Date and time when the FPC offline action is started.	detail
Offlined FPCs	List of FPCs that are turned offline by the system.	detail

Table 130: show chassis fabric reachability Output Fields (continued)

Field Name	Field Description	Level of Output
FPCs timed out	List of FPCs that have timed out waiting to be turned offline by the system.	<b>detail</b>
FPC being offlined	FPC that is being turned offline by the system, with date and time.	<b>detail</b>
FPC Offline completed	Date and time when the FPC offline action is completed.	<b>detail</b>
Plane restarting started	Date and time when the plane restart action is started.	<b>detail</b>
Planes restarted	List of planes restarted by the system.	<b>detail</b>
Planes being offlined / onlined	Planes that are currently being turned offline or turned online by the system, with date and time.	<b>detail</b>
Plane restarting completed	Date and time when the plane restarting action is completed.	<b>detail</b>
FPC online started	Date and time when FPC online action is started.	<b>detail</b>
Onlined FPCs	List of FPCs that are turned online by the system.	<b>detail</b>
FPCs timed out	FPCs that have timed out waiting to be turned online by the system.	<b>detail</b>
FPC being onlined	FPC that is being turned online by the system, with date and time.	<b>detail</b>
FPC Online completed	Date and time when the action of turning the FPCs online is completed.	<b>detail</b>
Phase Completed	Date and time when the plane and FPC restart phase is completed.	<b>detail</b>
Phase started	Date and time when the plane and FPC restart phase is started.	<b>detail</b>
FPC restart time	Date and time when the FPC restart action is started.	<b>detail</b>
FPC restarted	FPC that is restarted by the system, with date and time.	<b>detail</b>
Phase Completed	Date and time when the plane and FPC restart phase is completed.	<b>detail</b>
FPC Offline Phase	Status of the FPC offline phase. <ul style="list-style-type: none"> <li>• <b>Completed</b>— The FPC offline phase is completed.</li> <li>• <b>In progress</b>—The FPC offline phase is currently in progress.</li> </ul>	<b>detail</b>
Phase started	Date and time when the FPC offline phase is started.	<b>detail</b>
FPC Offline started	Date and time when the FPC offline action is started.	<b>detail</b>
Offlined FPCs	List of FPCs turned offline by the system.	<b>detail</b>
FPCs timed out	List of FPCs that have timed out waiting to be turned offline by the system.	<b>detail</b>

Table 130: show chassis fabric reachability Output Fields (continued)

Field Name	Field Description	Level of Output
FPC being offlined	FPC that is being turned offline by the system, with date and time.	<b>detail</b>
FPC Offline completed	Date and time when the FPC offline action is completed.	<b>detail</b>
Phase Completed	Date and time when the FPC offline phase is completed.	<b>detail</b>
Action Completed	Date and time when the system fabric down healing attempt is completed.	All levels
Fabric reachability resolution	Status after the healing actions are performed. <ul style="list-style-type: none"> <li>• <b>Unreachable destinations healed after <i>phase name</i></b>—The unreachable destinations are healed after the healing actions are performed. The phase name indicates the last healing phase.</li> <li>• <b>Unreachable destinations removed by FPCs <i>FPC number</i> offline</b>—The unreachable destinations are removed by turning the FPCs offline.</li> <li>• <b>Unreachable destinations present on FPC/PFE <i>FPC/PFE number</i></b>—The unreachable destinations are present on the FPCs or Packet Forwarding Engines and need to be acted upon.</li> </ul>	All levels

## Sample Output

### show chassis fabric reachability (T640 and T1600 routers)

```

user@host> show chassis fabric reachability

Fabric reachability status: Unreachable destinations removed

Fabric reachability detection:
  Unreachable destinations      : Present on 3 FPCs
  Detected on                  : 2010-11-22 15:19:45 PST
  Reason                       : Fabric plane error

Fabric reachability action:
  Fabric reachability action    : FPC action
  Acting on                    : Fabric plane error
  Initial phase                 : Plane restart
  Current phase                 : FPC offline is completed
  Action started                : 2010-11-22 15:08:05 PST
  Action completed              : 2010-11-22 15:19:45 PST

Fabric reachability resolution: Unreachable destinations removed by FPCs 2, 3, 5
offline

```

### show chassis fabric reachability detail (T640 and T1600 routers)

```

user@host> show chassis fabric reachability detail

Fabric reachability status: Unreachable destinations removed
Fabric reachability detection:
  Unreachable destinations      : Present on 3 FPCs

```



```

Detected on          : 2010-11-15 15:50:32 PST
Reason               : Fabric plane error

Fabric reachability action:
Fabric reachability action : FPC action
Acting on               : Fabric plane error
Initial phase           : Plane restart
Current phase           : FPC offline is completed
Action started          : 2010-11-15 15:41:47 PST
  Plane restart phase    : Completed
    Phase started        : 2010-11-15 15:41:47 PST
      Planes restarted    : 0, 1, 2, 3, 4, 0
        Phase completed   : 2010-11-15 15:42:14 PST
  Plane and FPC Restart Phase : Completed
    Phase started         : 2010-11-15 15:45:52 PST
      FPC Offline Started  : 2010-11-15 15:45:52 PST
        Offlined FPCs     : 2, 3, 5, 7
          FPC Offline completed : 2010-11-15 15:45:52 PST
            Plane restarting started : 2010-11-15 15:45:52 PST
              Planes restarted : 0, 1, 2, 3, 4, 0
                Plane restarting completed : 2010-11-15 15:46:11 PST
                  FPC online started : 2010-11-15 15:46:11 PST
                    Onlined FPCs : 2, 3, 5, 7
                      FPC online completed : 2010-11-15 15:46:50 PST
                        Phase completed : 2010-11-15 15:46:50 PST
  FPC offline phase      : Completed
    Phase started        : 2010-11-15 15:50:32 PST
      FPC offline started : 2010-11-15 15:50:32 PST
        Offlined FPCs    : 2, 3, 5
          FPC offline completed : 2010-11-15 15:50:32 PST
            Phase completed : 2010-11-15 15:50:32 PST
  Action completed       : 2010-11-15 15:50:32 PST

Fabric reachability resolution: Unreachable destinations removed by FPCs 2, 3, 5
offline

```

### show chassis fabric reachability (PTX5000 system)

```

user@host> show chassis fabric reachability

Fabric reachability status: Enabled destinations transitioned to unreachable,
Fabric down action in progress

Fabric reachability detection:
Unreachable destinations      : Present on 5 FPCs
  Detected on                 : 2012-11-14 15:53:00 PST
  Reason                      : Fabric plane error

Fabric reachability action:
Fabric reachability action    : SIB action
Acting on                    : Fabric plane error
Initial phase                 : SIB restart
Current phase                 : SIB restart is in progress
Action started                : 2012-11-14 15:53:00 PST

```

### show chassis fabric reachability (PTX10008 Router)

```

user@host> show chassis fabric reachability

```

```
Fabric reachability status: Enabled destinations reachable
```

```
Fabric reachability detection:
  Unreachable destinations      : Present on 0 FPCs
  Detected on                  : 2017-05-10 01:54:09 PDT
```

### show chassis fabric reachability (MX2020 Router with SFB2)

```
user@host > show chassis fabric reachability
```

```
Fabric reachability status: No Fabric degradation detected now
```

### show chassis fabric reachability detail (MX10003 Router)

```
user@host > show chassis fabric reachability detail
```

```
May 23 23:52:27
```

```
Fabric reachability status: Fabric degradation condition healed
  Detected on                  : 2017-05-23 23:49:54 PDT
  Reason                      : Fabric Degradation due to Plane
faults (fabric error)
```

```
Fabric reachability action:
  Fabric reachability action   : Plane action
  Current phase                : Plane Restart Phase is completed
  Action started               : 2017-05-23 23:50:04 PDT
  Action completed             : 2017-05-23 23:52:22 PDT
    Plane restart phase        : Completed
      Phase started            : 2017-05-23 23:50:04 PDT
        Planes restarted       : 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10,
11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21
      Phase completed          : 2017-05-23 23:52:22 PDT
```

### show chassis fabric reachability (TX Matrix router)

```
user@host> show chassis fabric reachability
```

```
Fabric reachability status: Enabled destinations transitioned to unreachable,
Fabric down action in progress
```

```
Fabric reachability detection:
  Unreachable destinations      : Present on 14 FPCs
  Detected on                  : 2013-08-29 02:09:16 PDT
  Reason                      : Fabric plane error
```

```
Fabric reachability action:
  Fabric reachability action   : Plane action
  Acting on                   : Fabric plane error
  Initial phase                : Plane restart
  Current phase                : Plane restart is in progress
  Action started               : 2013-08-29 02:09:16 PDT
```

### show chassis fabric reachability detail (TX Matrix router)

```
user@host> show chassis fabric reachability detail
```

```
Fabric reachability status: Enabled destinations transitioned to unreachable,
Fabric down action in progress
```

```
Fabric reachability detection:
```

```
    Unreachable destinations      : Present on 14 FPCs
      Detected on                 : 2013-08-29 02:09:16 PDT
      Reason                     : Fabric plane error
```

```
Fabric reachability action:
```

```
    Fabric reachability action    : Plane action
      Acting on                  : Fabric plane error
      Initial phase               : Plane restart
      Current phase               : Plane restart is in progress
      Action started              : 2013-08-29 02:09:16 PDT
        Plane restart phase       : In progress
          Phase started           : 2013-08-29 02:09:16 PDT
            Planes restarted      : 0, 2, 3
            Planes being offlined : 4 : 2013-08-29 02:10:11 PDT
```

### show chassis fabric reachability detail (MX960 router)

After triggering a phase action from an MPC, the **show chassis fabric reachability** command includes output from DPCs, MPCs, or FPCs.

```
user@host> show chassis fabric reachability detail
```

```
Fabric reachability status: Fabric degradation condition healed
```

```
    Detected on      : 2018-03-14 22:28:03 PDT
    Reason           : Fabric Degradation due to grant
timeouts seen by DPCs, MPCs, or FPCs
```

```
Fabric reachability action:
```

```
    Fabric reachability action    : Plane action
      Current phase               : Plane Restart Phase is completed
      Action started              : 2018-03-14 22:28:17 PDT
      Action completed            : 2018-03-14 22:29:28 PDT
        Plane restart phase       : Completed
          Phase started           : 2018-03-14 22:28:17 PDT
            Planes restarted      : 0, 1, 2, 3
            Phase completed       : 2018-03-14 22:29:28 PDT
```

```
Fabric reachability resolution: Fabric degradation healed after phase Plane restart
```

## show chassis fabric sibs

---

<b>Syntax</b>	<pre>show chassis fabric sibs &lt;fcc number   scc&gt; &lt;slot slot-number&gt;</pre>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4. Command introduced on QFX Series switches in Junos OS Release 15.1X53-D30 Command introduced in Junos OS Release 17.2 for PTX10008 Routers.
<b>Description</b>	<p>(TX Matrix routers only) Display the state of the electrical and optical switch fabric link between the SIBs in the TX Matrix router (TX-SIBs) and the SIBs in the T640 routers (T640 LCC SIBs).</p> <p>(M320, T640, T1600, T4000 and PTX Series routers and QFX Series switches) Display the state of the electrical switch fabric link between the SIBs and the FPCs.</p>
<b>Options</b>	<p><b>none</b>—(TX Matrix routers only) Display the state of the electrical and optical switch fabric link between the SIBs in the TX Matrix router (TX-SIBs) and the SIBs in the T640 routers (T640 LCC SIBs).</p> <p>(M320, T640, T1600, T4000 and PTX Series routers and QFX Series switches) Display the state of the electrical switch fabric link between the SIBs and the FPCs.</p> <p><b>fcc number</b>—(Optional) Display the switching fabric link state for the T640 SIBs on a specified T640 router (line-card chassis) connected to a TX Matrix router.</p> <p><b>scc</b>—(Optional) Display the switching fabric link state for the TX-SIBs on the TX Matrix router (switch-card chassis).</p> <p><b>slot slot-number</b>—(Optional) Display the state of the electrical switch fabric link between the specified SIB slot and the FPCs.</p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">request chassis sib on page 898</a></li><li>• <a href="#">show chassis sibs on page 2124</a></li><li>• <i>Monitoring the SIBs</i></li><li>• <i>Redundant SIBs Overview</i></li></ul>
<b>List of Sample Output</b>	<p><a href="#">show chassis fabric sibs (M320 Router) on page 1565</a></p> <p><a href="#">show chassis fabric sibs (T640 Router) on page 1565</a></p> <p><a href="#">show chassis fabric sibs (T1600 Router) on page 1566</a></p> <p><a href="#">show chassis fabric sibs (T4000 Core Router) on page 1568</a></p>

[show chassis fabric sibs \(TX Matrix Router\) on page 1569](#)  
[show chassis fabric sibs lcc \(TX Matrix Router\) on page 1571](#)  
[show chassis fabric sibs scc \(TX Matrix Router\) on page 1572](#)  
[show chassis fabric sibs slot \(PTX3000 Router\) on page 1573](#)  
[show chassis fabric sibs \(PTX10008 Router\) on page 1573](#)  
[show chassis fabric sibs \(QFX10008 Switch\) on page 1574](#)

**Output Fields** [Table 131 on page 1563](#) lists the output fields for the **show chassis fabric sibs** command. Output fields are listed in the approximate order in which they appear.

*Table 131: show chassis fabric sibs Output Fields*

Field Name	Field Description
<b>Fabric management SIB state</b>	Switching fabric link (link from FPC to SIB) state for each SIB: <ul style="list-style-type: none"><li>• <b>Unused</b>—SIB is not present.</li><li>• <b>Links ok</b>—Link between the SIB and the FPC is active.</li><li>• <b>Link error</b>—Link between the SIB and the FPC is not operational.</li></ul>

Table 131: show chassis fabric sibs Output Fields (continued)

Field Name	Field Description
Plane state	<p>Possible plane state of the M320 SIB, TX-SIB or T640 SIB:</p> <ul style="list-style-type: none"> <li>• <b>S_ACTIVE</b>—Links on the SIB are operational, and the fabric plane (SIB) is operational and running.</li> <li>• <b>S_SPARE</b>—Links on the SIB are operational and the fabric plane (SIB) is redundant and can be operational if any of the fabric planes in the <b>S_ACTIVE</b> state encounters an error.</li> </ul> <p><b>NOTE:</b> If the plane is unusable by any of the Packet Forwarding Engines, the command output displays an additional string, <b>plane has link errors on # pfes</b>, where, # indicates the total number of links (both from SIB to FPC, and from FPC to SIB) having link errors (detected either during initialization time or runtime) in this particular plane. This does not count links having destination errors.</p> <ul style="list-style-type: none"> <li>• <b>S_EMPTY</b>—No links are present on the SIB, and the fabric plane (SIB) is powered down.</li> <li>• <b>S_ACTIVATING</b>—Links on the SIB are coming online; this is a transitional state.</li> <li>• <b>S_DEACTIVATING</b>—Links on the SIB are going offline; this is a transitional state.</li> <li>• <b>S_FAULTING</b>—Links on the SIB are being marked faulty, and the fabric plane (SIB) is not operational.</li> <li>• <b>S_FAULT</b>—Links on the SIB are in an alarmed state, and the fabric plane (SIB) is not operational for the following reasons: <ul style="list-style-type: none"> <li>• On-board F-chip is not operational.</li> <li>• Fiber optic connector faults.</li> <li>• FPC connector faults.</li> </ul> </li> </ul> <p>Possible plane state of the QFX Series SIB:</p> <ul style="list-style-type: none"> <li>• <b>Active</b>—Links on the SIB are operational, and the fabric plane (SIB) is operational and running.</li> <li>• <b>Spare</b>—Links on the SIB are operational and the fabric plane (SIB) is redundant and can be operational if any of the fabric planes in the <b>S_ACTIVE</b> state encounters an error.</li> <li>• <b>Empty</b>—No links are present on the SIB, and the fabric plane (SIB) is powered down.</li> <li>• <b>Activating</b>—Links on the SIB are coming online; this is a transitional state.</li> <li>• <b>Deactivating</b>—Links on the SIB are going offline; this is a transitional state.</li> <li>• <b>Faulting</b>—Links on the SIB are being marked faulty, and the fabric plane (SIB) is not operational.</li> <li>• <b>Fault</b>—Links on the SIB are in an alarmed state, and the fabric plane (SIB) is not operational for the following reasons: <ul style="list-style-type: none"> <li>• On-board F-chip is not operational.</li> <li>• Fiber optic connector faults.</li> <li>• FPC connector faults.</li> </ul> </li> </ul>

## Sample Output

### show chassis fabric sibs (M320 Router)

```
user@host> show chassis fabric sibs
```

```
Fabric management SIB state:
```

```
SIB #0
```

```
plane state: S_ACTIVE
```

```
FPC #0
```

```
PFE #1 : Links ok
```

```
FPC #1
```

```
PFE #1 : Links ok
```

```
FPC #2
```

```
PFE #1 : Links ok
```

```
FPC #3
```

```
PFE #1 : Links ok
```

```
SIB #1
```

```
plane state: S_ACTIVE
```

```
FPC #0
```

```
PFE #1 : Links ok
```

```
FPC #1
```

```
PFE #1 : Links ok
```

```
FPC #2
```

```
PFE #1 : Links ok
```

```
FPC #3
```

```
PFE #1 : Links ok
```

```
SIB #2
```

```
plane state: S_ACTIVE
```

```
FPC #0
```

```
PFE #1 : Links ok
```

```
FPC #1
```

```
PFE #1 : Links ok
```

```
FPC #2
```

```
PFE #1 : Links ok
```

```
FPC #3
```

```
PFE #1 : Links ok
```

```
SIB #3
```

```
plane state: S_ACTIVE
```

```
FPC #0
```

```
PFE #1 : Links ok
```

```
FPC #1
```

```
PFE #1 : Links ok
```

```
FPC #2
```

```
PFE #1 : Links ok
```

```
FPC #3
```

```
PFE #1 : Links ok
```

### show chassis fabric sibs (T640 Router)

```
user@host> show chassis fabric sibs
```

```
Fabric management SIB state:
```

```
SIB #0
```

```
plane state: S_SPARE
```

```
FPC #0
```

```
PFE #1 : Links ok
```

```
FPC #2
```

```
PFE #1 : Links ok
```

```
FPC #3
```

```
        PFE #0 : Links ok
        PFE #1 : Links ok
SIB #1
  plane state: S_ACTIVE
  FPC #0
    PFE #1 : Links ok
  FPC #2
    PFE #1 : Links ok
  FPC #3
    PFE #0 : Links ok
    PFE #1 : Links ok
SIB #2
  plane state: S_ACTIVE
  FPC #0
    PFE #1 : Links ok
  FPC #2
    PFE #1 : Links ok
  FPC #3
    PFE #0 : Links ok
    PFE #1 : Links ok
SIB #3
  plane state: S_ACTIVE
  FPC #0
    PFE #1 : Links ok
  FPC #2
    PFE #1 : Links ok
  FPC #3
    PFE #0 : Links ok
    PFE #1 : Links ok
SIB #4
  plane state: S_ACTIVE
  FPC #0
    PFE #1 : Links ok
  FPC #2
    PFE #1 : Links ok
  FPC #3
    PFE #0 : Links ok
    PFE #1 : Links ok
```

### show chassis fabric sibs (T1600 Router)

```
user@host> show chassis fabric sibs
```

```
SIB #0
  plane state: S_SPARE
  FPC #0
    PFE #0 : Links ok
    PFE #1 : Links ok
  FPC #1
    PFE #0 : Links ok
    PFE #1 : Links ok
  FPC #2
    PFE #0 : Links ok
  FPC #4
    PFE #0 : Links ok
    PFE #1 : Links ok
  FPC #5
    PFE #0 : Links ok
  FPC #6
    PFE #0 : Links ok
```



```

        PFE #1 : Links ok
FPC #7
        PFE #0 : Links ok
        PFE #1 : Links ok
SIB #1
plane state: S_ACTIVE , plane has link errors on 2 pfes
FPC #0
        PFE #0 : Links ok
        PFE #1 : Links ok
FPC #1
        PFE #0 : Links ok
        PFE #1 : Links ok
FPC #3
        PFE #0 : Links ok
        PFE #1 : Links ok
FPC #4
        PFE #0 : Links ok
        PFE #1 : Links ok
FPC #5
        PFE #0 : Links ok
        PFE #1 : Links ok
FPC #7
        PFE #0 : Links ok
        PFE #1 : Links okSIB #2
plane state: S_ACTIVE
SIB #2
plane state: S_ACTIVE
FPC #0
        PFE #0 : Links ok
        PFE #1 : Links ok
FPC #1
        PFE #0 : Links ok
        PFE #1 : Links ok
FPC #2
        PFE #0 : Links ok
FPC #4
        PFE #0 : Links ok
        PFE #1 : Links ok
FPC #5
        PFE #0 : Links ok
FPC #6
        PFE #0 : Links ok
        PFE #1 : Links ok
FPC #7
        PFE #0 : Links ok
        PFE #1 : Links ok
SIB #3
plane state: S_ACTIVE
FPC #0
        PFE #0 : Links ok
        PFE #1 : Links ok
FPC #1
        PFE #0 : Links ok
        PFE #1 : Links ok
FPC #2
        PFE #0 : Links ok
FPC #4
        PFE #0 : Links ok
        PFE #1 : Links ok
FPC #5

```

```

        PFE #0 : Links ok
    FPC #6
        PFE #0 : Links ok
        PFE #1 : Links ok
    FPC #7
        PFE #0 : Links ok
        PFE #1 : Links ok
SIB #4
    plane state: S_ACTIVE
    FPC #0
        PFE #0 : Links ok
        PFE #1 : Links ok
    FPC #1
        PFE #0 : Links ok
        PFE #1 : Links ok
    FPC #2
        PFE #0 : Links ok
    FPC #4
        PFE #0 : Links ok
        PFE #1 : Links ok
    FPC #5
        PFE #0 : Links ok
    FPC #6
        PFE #0 : Links ok
        PFE #1 : Links ok
    FPC #7
        PFE #0 : Links ok
        PFE #1 : Links ok

```

#### show chassis fabric sibs (T4000 Core Router)

```
user@host> show chassis fabric sibs
```

```
Fabric management SIB state:
```

```

SIB #0
    plane state: S_SPARE
    FPC #2
        PFE #0 : Links ok
    FPC #3
        PFE #0 : Links ok
    FPC #5
        PFE #0 : Links ok
        PFE #1 : Links ok
    FPC #6
        PFE #0 : Links ok
        PFE #1 : Links ok
SIB #1
    plane state: S_ACTIVE
    FPC #2
        PFE #0 : Links ok
    FPC #3
        PFE #0 : Links ok
    FPC #5
        PFE #0 : Links ok
        PFE #1 : Links ok
    FPC #6
        PFE #0 : Links ok
        PFE #1 : Links ok
SIB #2
    plane state: S_ACTIVE

```

```

FPC #2
  PFE #0 : Links ok
FPC #3
  PFE #0 : Links ok
FPC #5
  PFE #0 : Links ok
  PFE #1 : Links ok
FPC #6
  PFE #0 : Links ok
  PFE #1 : Links ok
SIB #3
  plane state: S_ACTIVE
  FPC #2
    PFE #0 : Links ok
  FPC #3
    PFE #0 : Links ok
  FPC #5
    PFE #0 : Links ok
    PFE #1 : Links ok
  FPC #6
    PFE #0 : Links ok
    PFE #1 : Links ok
SIB #4
  plane state: S_ACTIVE
  FPC #2
    PFE #0 : Links ok
  FPC #3
    PFE #0 : Links ok
  FPC #5
    PFE #0 : Links ok
    PFE #1 : Links ok
  FPC #6
    PFE #0 : Links ok
    PFE #1 : Links ok

```

### show chassis fabric sibs (TX Matrix Router)

```
user@host> show chassis fabric sibs
```

```
scc-re0:
```

```
-----
Fabric management SIB state:
```

```

SIB #1
  plane state: S_ACTIVE , plane has link errors on 2 pfes
  FPC #0
    PFE #0 : Links ok
    PFE #1 : Links ok
  FPC #1
    PFE #0 : Links ok
    PFE #1 : Links ok
  FPC #3
    PFE #0 : Links ok
    PFE #1 : Links ok
  FPC #4
    PFE #0 : Links ok
    PFE #1 : Links ok
  FPC #5
    PFE #0 : Links ok
    PFE #1 : Links ok
  FPC #7

```

```
        PFE #0 : Links ok
        PFE #1 : Links ok
SIB #2
  plane state: S_ACTIVE
  LCC #0      : Links ok
  LCC #1      : Links ok
SIB #3
  plane state: S_ACTIVE
  LCC #0      : Links ok
  LCC #1      : Links ok
SIB #4
  plane state: S_ACTIVE
  LCC #0      : Links ok
  LCC #1      : Links ok
```

lcc0-re0:

-----  
Fabric management SIB state:

```
SIB #1
  plane state: S_ACTIVE
  FPC #0
    PFE #0 : Links ok
    PFE #1 : Links ok
  FPC #1
    PFE #1 : Links ok
  FPC #2
    PFE #0 : Links ok
    PFE #1 : Links ok
  FPC #3
    PFE #1 : Links ok
  FPC #4
    PFE #1 : Links ok
  FPC #5
    PFE #0 : Links ok
  FPC #6
    PFE #1 : Links ok
  FPC #7
    PFE #1 : Links ok
  SCC      : Links ok
SIB #2
  plane state: S_ACTIVE
  FPC #0
    PFE #0 : Links ok
    PFE #1 : Links ok
  FPC #1
    PFE #1 : Links ok
  FPC #2
    PFE #0 : Links ok
    PFE #1 : Links ok
  FPC #3
    PFE #1 : Links ok
  FPC #4
    PFE #1 : Links ok
  FPC #5
    PFE #0 : Links ok
  FPC #6
    PFE #1 : Links ok
  FPC #7
    PFE #1 : Links ok
  SCC      : Links ok
```

```

SIB #3
  plane state: S_ACTIVE
  FPC #0
    PFE #0 : Links ok
    PFE #1 : Links ok
  FPC #1
    PFE #1 : Links ok
  FPC #2
    PFE #0 : Links ok
    PFE #1 : Links ok
  FPC #3
    PFE #1 : Links ok
  FPC #4
    PFE #1 : Links ok
  FPC #5
    PFE #0 : Links ok
  FPC #6
    PFE #1 : Links ok
  FPC #7
    PFE #1 : Links ok
  SCC      : Links ok
SIB #4
  plane state: S_ACTIVE
  FPC #0
    PFE #0 : Links ok
    PFE #1 : Links ok
  FPC #1
    PFE #1 : Links ok
  FPC #2
    PFE #0 : Links ok
    PFE #1 : Links ok
  FPC #3
    PFE #1 : Links ok
  FPC #4
    PFE #1 : Links ok
  FPC #5
    PFE #0 : Links ok
  FPC #6
    PFE #1 : Links ok
  FPC #7
    PFE #1 : Links ok
  SCC      : Links o

```

### show chassis fabric sibs lcc (TX Matrix Router)

```
user@host> show chassis fabric sibs lcc 0
```

```
lcc1-re0:
```

```
-----
Fabric management SIB state:
```

```

SIB #1
  plane state: S_ACTIVE
  FPC #0
    PFE #0 : Links ok
  FPC #2
    PFE #1 : Links ok
  FPC #4
    PFE #0 : Links ok
  FPC #5
    PFE #1 : Links ok

```

```

    FPC #7
      PFE #0 : Links ok
    SCC      : Links ok
SIB #2
  plane state: S_ACTIVE
  FPC #0
    PFE #0 : Links ok
  FPC #2
    PFE #1 : Links ok
  FPC #4
    PFE #0 : Links ok
  FPC #5
    PFE #1 : Links ok
  FPC #7
    PFE #0 : Links ok
  SCC      : Links ok
SIB #3
  plane state: S_ACTIVE
  FPC #0
    PFE #0 : Links ok
  FPC #2
    PFE #1 : Links ok
  FPC #4
    PFE #0 : Links ok
  FPC #5
    PFE #1 : Links ok
  FPC #7
    PFE #0 : Links ok
  SCC      : Links ok
SIB #4
  plane state: S_ACTIVE
  FPC #0
    PFE #0 : Links ok
  FPC #2
    PFE #1 : Links ok
  FPC #4
    PFE #0 : Links ok
  FPC #5
    PFE #1 : Links ok
  FPC #7
    PFE #0 : Links ok
  SCC      : Links ok

```

### show chassis fabric sibs scc (TX Matrix Router)

```
user@host> show chassis fabric sibs scc
```

```
scc-re0:
```

```
-----
Fabric management SIB state:
```

```

SIB #1
  plane state: S_ACTIVE
  LCC #0      : Links ok
  LCC #1      : Links ok
SIB #2
  plane state: S_ACTIVE
  LCC #0      : Links ok
  LCC #1      : Links ok
SIB #3
  plane state: S_ACTIVE

```

```

LCC #0      : Links ok
LCC #1      : Links ok
SIB #4
plane state: S_ACTIVE
LCC #0      : Links ok
LCC #1      : Links ok

```

### show chassis fabric sibs slot (PTX3000 Router)

```
user@host> show chassis fabric sibs slot 0
```

```

Fabric management SIB state:
SIB #0 Online
  Fcore #0 (plane 0) Active
    FPC #8
      PFE #0 : OK
      PFE #1 : OK
    FPC #12
      PFE #0 : OK
      PFE #1 : OK
  Fcore #1 (plane 1) Active
    FPC #8
      PFE #0 : OK
      PFE #1 : OK
    FPC #12
      PFE #0 : OK
      PFE #1 : OK

```

### show chassis fabric sibs (PTX10008 Router)

```
user@host> show chassis fabric sibs
```

```

Fabric management SIB state:
SIB #0 Online
  FASIC #0 (plane 0) Active
    FPC #0
      PFE #0 : OK
      PFE #1 : OK
      PFE #2 : OK
    FPC #5
      PFE #0 : OK
      PFE #1 : OK
      PFE #2 : OK
      PFE #3 : OK
      PFE #4 : OK
      PFE #5 : OK
    FPC #6
      PFE #0 : OK
      PFE #1 : OK
      PFE #2 : OK
      PFE #3 : OK
      PFE #4 : OK
      PFE #5 : OK
  FASIC #1 (plane 1) Active
    FPC #0
      PFE #0 : OK
      PFE #1 : OK
      PFE #2 : OK
    FPC #5

```

```

        PFE #0 : OK
        PFE #1 : OK
        PFE #2 : OK
        PFE #3 : OK
        PFE #4 : OK
        PFE #5 : OK
    FPC #6
        PFE #0 : OK
        PFE #1 : OK
        PFE #2 : OK
        PFE #3 : OK
        PFE #4 : OK
        PFE #5 : OK
SIB #1 Online
    FASIC #0 (plane 2) Active
        FPC #0
            PFE #0 : OK
            PFE #1 : OK
            PFE #2 : OK
        FPC #5
            PFE #0 : OK
            PFE #1 : OK
            PFE #2 : OK
            PFE #3 : OK
            PFE #4 : OK
            PFE #5 : OK
        FPC #6
            PFE #0 : OK
            PFE #1 : OK
            PFE #2 : OK
            PFE #3 : OK
            PFE #4 : OK
            PFE #5 : OK
    FASIC #1 (plane 3) Active
        FPC #0
            PFE #0 : OK
            PFE #1 : OK
            PFE #2 : OK
        FPC #5
            PFE #0 : OK
            PFE #1 : OK
            PFE #2 : OK
            PFE #3 : OK
            PFE #4 : OK
            PFE #5 : OK
        FPC #6
            PFE #0 : OK
            PFE #1 : OK
            PFE #2 : OK
            PFE #3 : OK
            PFE #4 : OK
            PFE #5 : OK
SIB #2 Empty
SIB #3 Empty
SIB #4 Empty
SIB #5 Empty

```

#### show chassis fabric sibs (QFX10008 Switch)

```
user@host> show chassis fabric sibs
```



```
Fabric management SIB state:
SIB #0 Online
  FASIC #0 (plane 0) Active
    FPC #0
      PFE #0 : OK
      PFE #1 : OK
      PFE #2 : OK
      PFE #3 : OK
    FPC #1
      PFE #0 : OK
      PFE #1 : OK
  FASIC #1 (plane 1) Active
    FPC #0
      PFE #0 : OK
      PFE #1 : OK
    FPC #12
      PFE #0 : OK
      PFE #1 : OK
SIB #1 Empty
SIB #2 Empty
SIB #3 Empty
SIB #4 Empty
SIB #5 Empty
```

## show chassis fabric summary

---

<b>List of Syntax</b>	<a href="#">Syntax on page 1576</a> <a href="#">Syntax (EX9253 Switches) on page 1576</a>
<b>Syntax</b>	<code>show chassis fabric summary &lt;extended&gt;</code>
<b>Syntax (EX9253 Switches)</b>	<code>show chassis fabric summary</code>
<b>Release Information</b>	<p>Command introduced in Junos OS Release 8.4.</p> <p>Command introduced in Junos OS Release 9.4 for EX Series switches.</p> <p>Command introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 15.1X53-D30 for QFX Series switches.</p> <p><b>extended</b> option added in Junos OS Release 14.1R2.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 18.2 for MX10008 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.2 for PTX10008 Routers.</p> <p>Command introduced in Junos OS Release 18.2 for EX9253 Switches.</p>
<b>Description</b>	<p>(MX Series routers and EX8200 switches only) Display the state of all fabric planes and the elapsed uptime.</p> <p>(QFX Series switches) Display the state of all fabric planes.</p>
<b>Options</b>	<b>extended</b> —(Optional) Display the extended summary of fabric planes.
<b>Required Privilege Level</b>	view
<b>List of Sample Output</b>	<a href="#">show chassis fabric summary (MX240 Router) on page 1579</a> <a href="#">show chassis fabric summary (MX480 Router) on page 1579</a> <a href="#">show chassis fabric summary (MX480 Router with MPC4E) on page 1580</a> <a href="#">show chassis fabric summary (MX960 Router) on page 1580</a> <a href="#">show chassis fabric summary (MX10008 Router) on page 1580</a> <a href="#">show chassis fabric summary (MX2010 Router) on page 1580</a> <a href="#">show chassis fabric summary (MX2020 Router) on page 1581</a> <a href="#">show chassis fabric summary (MX2020 Router with MPC4E) on page 1581</a> <a href="#">show chassis fabric summary (MX2008) on page 1581</a> <a href="#">show chassis fabric summary (EX8200 Switch) on page 1581</a> <a href="#">show chassis fabric summary (EX9253 Switch) on page 1582</a> <a href="#">show chassis fabric summary (PTX Series Packet Transport Router) on page 1582</a>

[show chassis fabric summary \(PTX10008 Router\) on page 1582](#)  
[show chassis fabric summary \(QFX 10008 Switch\) on page 1583](#)  
[show chassis fabric summary extended \(MX960 Router\) on page 1583](#)  
[show chassis fabric summary \(MX10003 Router\) on page 1584](#)  
[show chassis fabric summary extended \(MX10003 Router\) on page 1584](#)

**Output Fields** [Table 132 on page 1577](#) lists the output fields for the **show chassis fabric summary** command. Output fields are listed in the approximate order in which they appear.

*Table 132: show chassis fabric summary Output Fields*

Field Name	Field Description
Plane	(MX Series, MX2020, MX2010, and MX2008 Routers only) Plane number.

Table 132: show chassis fabric summary Output Fields (continued)

Field Name	Field Description
<b>State</b>	<p>(MX Series and QFX Series) State of the SIB or FPC:</p> <ul style="list-style-type: none"> <li>• <b>Online</b>—Switch Interface Board (SIB) is operational and running.</li> </ul> <p><b>NOTE:</b> On the Enhanced MX SCB with Trio MPC, a maximum of 4 planes are operational and running. On all the other SCBs with Trio MPC, all the planes are operational and running.</p> <ul style="list-style-type: none"> <li>• <b>Empty</b>—SIB is powered down.</li> <li>• <b>Check</b>—SIB is in the <b>Check</b> state because of the following reasons: <ul style="list-style-type: none"> <li>• SIB is not inserted properly.</li> <li>• Some destination errors are detected on the SIB. In this case, the Packet Forwarding Engine stops using the SIB to send traffic to the affected destination Packet Forwarding Engine.</li> <li>• Some link errors are detected on the channel between the SIB and a Packet Forwarding Engine. Link errors can be detected at initialization time or runtime: <ul style="list-style-type: none"> <li>• Link errors caused by a link training failure at initialization time—The Packet Forwarding Engine does not use the SIB to send traffic. The <b>show chassis fabric fpcs</b> command shows <b>Plane disabled</b> as status for this link.</li> <li>• Link errors caused by CRC errors detected at runtime—The Packet Forwarding Engine continues to use the SIB to send traffic. The <b>show chassis fabric fpcs</b> command shows <b>Link error</b> as the status for this link.</li> </ul> </li> </ul> </li> </ul> <p><b>NOTE:</b> The <b>Check</b> state does not apply to PTX Series Packet Transport Routers because there are no SIBs in the Check state.</p> <p>For information about link and destination errors, issue the <b>show chassis fabric fpcs</b> commands.</p> <ul style="list-style-type: none"> <li>• <b>Spare</b>—SIB is redundant and will move to active state if one of the working SIBs fails.</li> </ul> <p><b>NOTE:</b> <b>Spare</b> does not apply to PTX Series Packet Transport Routers because there are no spare SIBs in the device.</p> <p>(MX2010, MX2020, and MX2008 Routers) State of the SFB.</p> <ul style="list-style-type: none"> <li>• <b>Online</b>—Switch Fabric Board (SFB) is operational and running.</li> <li>• <b>Offline</b>—Switch Fabric Board (SFB) is powered down.</li> <li>• <b>Check</b>—Switch Fabric Board (SFB) is in the check state.</li> </ul>
<b>Errors</b>	<p>(PTX Series and QFX Series) Indicates whether there is any error on the SIB.</p> <ul style="list-style-type: none"> <li>• <b>None</b>—No errors</li> <li>• <b>Link Errors</b>—Fabric link errors were found on the SIB RX link.</li> <li>• <b>Cell drops</b>—Fabric cell drops were found on the SIB ASIC.</li> <li>• <b>Link, Cell drops</b>—Both Link errors and cell drops were detected on at least one of the FPC's fabric links.</li> </ul>

Table 132: show chassis fabric summary Output Fields (continued)

Field Name	Field Description
	<ul style="list-style-type: none"> <li>• <b>Asic Errors</b>—A fault affecting one of the ASICs on the SIB is detected. It can be an IO error or an internal error signaled by the ASIC.</li> </ul> <p><b>NOTE:</b> The <b>Errors</b> column is empty only when the FPC or SIB is offline.</p>
<b>Uptime</b>	(MX Series, MX2010, MX2020, and MX2008 Routers) Elapsed time the plane has been online.
<b>Link Error</b>	Fabric link errors were found on the SIB RX link.
<b>Link TF</b>	Fabric link training failure has occurred.
<b>Destination errors</b>	<ul style="list-style-type: none"> <li>• <b>Local</b>—Destination error detected on the FPC or PFE's own self-stream.</li> <li>• <b>Remote</b>—Destination error detected on the FPC or PFE's non-self-streams.</li> </ul>

## Sample Output

### show chassis fabric summary (MX240 Router)

```
user@host> show chassis fabric summary
```

```
Plane  State  Uptime
0      Online 23 hours, 26 minutes, 54 seconds
1      Online 23 hours, 26 minutes, 54 seconds
2      Check 18 hours, 33 minutes, 42 seconds
3      Online 23 hours, 26 minutes, 54 seconds
4      Spare 23 hours, 26 minutes, 54 seconds
5      Spare 23 hours, 26 minutes, 54 seconds
6      Spare 23 hours, 26 minutes, 54 seconds
7      Spare 23 hours, 26 minutes, 54 seconds
```

### show chassis fabric summary (MX480 Router)

```
user@host> show chassis fabric summary
```

```
Plane  State  Uptime
0      Online 8 hours, 45 minutes, 29 seconds
1      Online 8 hours, 45 minutes, 28 seconds
2      Online 8 hours, 45 minutes, 28 seconds
3      Online 8 hours, 45 minutes, 28 seconds
4      Spare 8 hours, 45 minutes, 28 seconds
5      Spare 8 hours, 45 minutes, 28 seconds
6      Spare 8 hours, 45 minutes, 28 seconds
7      Check 6 hours, 10 minutes, 12 seconds
```

**show chassis fabric summary (MX480 Router with MPC4E)**

```
user@host > show chassis fabric summary
```

Plane	State	Uptime
0	Online	6 hours, 57 minutes, 44 seconds
1	Online	6 hours, 57 minutes, 40 seconds
2	Online	6 hours, 57 minutes, 39 seconds
3	Online	6 hours, 57 minutes, 34 seconds
4	Spare	6 hours, 57 minutes, 34 seconds
5	Spare	6 hours, 57 minutes, 29 seconds
6	Spare	6 hours, 57 minutes, 29 seconds
7	Spare	6 hours, 57 minutes, 24 seconds

Note:  
For FPC slots with MPC Type 4 or MCC:  
Fabric planes 1 and 5, 3 and 7 use shared physical links.  
Those slots may run in a reduced bandwidth in case both  
plane 1 and 5, or both 3 and 7 are active.

**show chassis fabric summary (MX960 Router)**

```
user@host> show chassis fabric summary
```

Plane	State	Uptime
0	Online	3 hours, 7 minutes, 9 seconds
1	Online	3 hours, 7 minutes, 4 seconds
2	Online	3 hours, 6 minutes, 59 seconds
3	Online	3 hours, 6 minutes, 54 seconds
4	Empty	
5	Empty	

**show chassis fabric summary (MX10008 Router)**

```
user@host> show chassis fabric summary
```

Plane	State	Uptime
0	Online	19 hours, 27 minutes, 33 seconds
1	Online	19 hours, 27 minutes, 7 seconds
2	Online	19 hours, 26 minutes, 39 seconds
3	Online	19 hours, 26 minutes, 11 seconds
4	Online	19 hours, 26 minutes, 13 seconds
5	Online	19 hours, 26 minutes, 22 seconds

**show chassis fabric summary (MX2010 Router)**

```
user@host> show chassis fabric summary
```

Plane	State	Uptime
0	Online	1 day, 13 hours, 20 minutes, 10 seconds
1	Online	1 day, 13 hours, 19 minutes, 59 seconds
2	Online	1 day, 13 hours, 19 minutes, 49 seconds
3	Offline	
4	Online	1 day, 13 hours, 19 minutes, 28 seconds
5	Check	1 day, 13 hours, 19 minutes, 17 seconds
6	Online	1 day, 13 hours, 19 minutes, 6 seconds
7	Online	1 hour, 43 minutes, 5 seconds

**show chassis fabric summary (MX2020 Router)**

```
user@host> show chassis fabric summary
```

Plane	State	Uptime
0	Online	8 hours, 24 minutes, 1 second
1	Online	8 hours, 47 minutes, 54 seconds
2	Online	8 hours, 47 minutes, 44 seconds
3	Online	8 hours, 47 minutes, 33 seconds
4	Online	8 hours, 47 minutes, 22 seconds
5	Online	8 hours, 47 minutes, 12 seconds
6	Online	8 hours, 47 minutes, 1 second
7	Online	8 hours, 46 minutes, 50 seconds

**show chassis fabric summary (MX2020 Router with MPC4E)**

```
user@host > show chassis fabric summary
```

Plane	State	Uptime
0	Online	3 days, 6 hours, 58 minutes, 29 seconds
1	Online	3 days, 6 hours, 58 minutes, 18 seconds
2	Online	3 days, 6 hours, 58 minutes, 8 seconds
3	Online	3 days, 6 hours, 57 minutes, 57 seconds
4	Online	3 days, 6 hours, 57 minutes, 46 seconds
5	Online	3 days, 6 hours, 57 minutes, 36 seconds
6	Online	3 days, 6 hours, 57 minutes, 25 seconds
7	Online	3 days, 6 hours, 57 minutes, 14 seconds

**show chassis fabric summary (MX2008)**

```
user@host > show chassis fabric summary
```

Plane	State	Uptime
0	Offline	
1	Online	16 hours, 38 minutes, 34 seconds
2	Online	16 hours, 38 minutes, 29 seconds
3	Online	16 hours, 38 minutes, 24 seconds
4	Offline	
5	Online	16 hours, 38 minutes, 13 seconds
6	Online	16 hours, 38 minutes, 8 seconds
7	Offline	

**show chassis fabric summary (EX8200 Switch)**

```
user@host> show chassis fabric summary
```

Plane	State	Uptime
0	Online	12 days, 50 minutes, 54 seconds
1	Online	12 days, 50 minutes, 53 seconds
2	Online	12 days, 50 minutes, 53 seconds
3	Online	12 days, 50 minutes, 52 seconds
4	Spare	12 days, 50 minutes, 49 seconds
5	Spare	12 days, 50 minutes, 47 seconds
6	Spare	12 days, 50 minutes, 47 seconds
7	Spare	12 days, 50 minutes, 46 seconds
8	Online	12 days, 50 minutes, 52 seconds
9	Online	12 days, 50 minutes, 50 seconds
10	Online	12 days, 50 minutes, 50 seconds
11	Online	12 days, 50 minutes, 49 seconds

**show chassis fabric summary (EX9253 Switch)**

```
user@switch> show chassis fabric summary
```

Plane	State	Uptime
0	Online	21 days, 8 minutes, 41 seconds
1	Online	21 days, 8 minutes, 41 seconds
2	Online	21 days, 8 minutes, 41 seconds
3	Online	21 days, 8 minutes, 41 seconds
4	Online	21 days, 8 minutes, 41 seconds
5	Online	21 days, 8 minutes, 41 seconds
6	Online	21 days, 8 minutes, 41 seconds
7	Online	21 days, 8 minutes, 41 seconds
8	Online	21 days, 8 minutes, 41 seconds
9	Online	21 days, 8 minutes, 41 seconds
10	Online	21 days, 8 minutes, 41 seconds
11	Online	21 days, 8 minutes, 41 seconds
12	Online	21 days, 8 minutes, 41 seconds
13	Online	21 days, 8 minutes, 41 seconds
14	Online	21 days, 8 minutes, 41 seconds
15	Online	21 days, 8 minutes, 41 seconds
16	Online	21 days, 8 minutes, 41 seconds
17	Online	21 days, 8 minutes, 41 seconds
18	Online	21 days, 8 minutes, 41 seconds
19	Online	21 days, 8 minutes, 41 seconds
20	Online	21 days, 8 minutes, 41 seconds
21	Online	21 days, 8 minutes, 41 seconds

**show chassis fabric summary (PTX Series Packet Transport Router)**

```
user@host> show chassis fabric summary
```

FRU	State	Errors
SIB0	Online	None
SIB1	Online	Link Errors
SIB2	Online	None
SIB3	Online	Cell drops
SIB4	Offline	
SIB5	Online	None
SIB6	Online	Link, Cell drops
SIB7	Online	None
SIB8	Online	Link, Cell drops
FPC0	Online	None
FPC1	Online	Link Errors
FPC2	Online	None
FPC3	Offline	
FPC4	Online	None
FPC5	Online	None
FPC6	Empty	
FPC7	Empty	

**show chassis fabric summary (PTX10008 Router)**

```
user@host> show chassis fabric summary
```

FRU	State	Errors
SIB0	Online	None



SIB1	Online	None
SIB2	Empty	
SIB3	Empty	
SIB4	Empty	
SIB5	Empty	
FPC0	Online	None
FPC1	Empty	
FPC2	Empty	
FPC3	Empty	
FPC4	Empty	
FPC5	Online	None
FPC6	Online	None
FPC7	Empty	

### show chassis fabric summary (QFX 10008 Switch)

```
user@host> show chassis fabric summary
```

FRU	State	Errors
FPC0	Online	None
FPC1	Online	Link Errors
FPC2	Online	None
FPC3	Offline	
FPC4	Online	None
FPC5	Online	None
FPC6	Empty	
FPC7	Empty	
SIB0	Online	None
SIB1	Online	Link Errors
SIB2	Online	None
SIB3	Online	Cell drops
SIB4	Offline	
SIB5	Online	None

## Sample Output

### show chassis fabric summary extended (MX960 Router)

```
user@host> show chassis fabric summary extended
```

Plane	State	Link Error	Link TF	Destination errors Local / Remote	Uptime
0	Online	NO	NO	NO/ NO	7 days, 5 hours, 25 minutes, 20 seconds
1	Online	NO	NO	NO/ NO	7 days, 5 hours, 25 minutes, 11 seconds
2	Online	NO	NO	NO/ NO	7 days, 5 hours, 25 minutes, 5 seconds
3	Online	NO	NO	NO/ NO	7 days, 5 hours, 24 minutes, 59 seconds
4	Spare	NO	NO	NO/ NO	7 days, 5 hours, 24 minutes, 52 seconds
5	Spare	NO	NO	NO/ NO	7 days, 5 hours, 24 minutes, 45 seconds

## show chassis fabric summary (MX10003 Router)

user@host&gt; show chassis fabric summary

Plane	State	Uptime
0	Online	1 day, 10 hours, 12 minutes, 52 seconds
1	Online	1 day, 10 hours, 12 minutes, 52 seconds
2	Online	1 day, 10 hours, 12 minutes, 52 seconds
3	Online	1 day, 10 hours, 12 minutes, 52 seconds
4	Online	1 day, 10 hours, 12 minutes, 52 seconds
5	Online	1 day, 10 hours, 12 minutes, 52 seconds
6	Online	1 day, 10 hours, 12 minutes, 52 seconds
7	Online	1 day, 10 hours, 12 minutes, 52 seconds
8	Online	1 day, 10 hours, 12 minutes, 52 seconds
9	Online	1 day, 10 hours, 12 minutes, 52 seconds
10	Online	1 day, 10 hours, 12 minutes, 52 seconds
11	Online	1 day, 10 hours, 12 minutes, 52 seconds
12	Online	1 day, 10 hours, 12 minutes, 52 seconds
13	Online	1 day, 10 hours, 12 minutes, 52 seconds
14	Online	1 day, 10 hours, 12 minutes, 52 seconds
15	Online	1 day, 10 hours, 12 minutes, 52 seconds
16	Online	1 day, 10 hours, 12 minutes, 52 seconds
17	Online	1 day, 10 hours, 12 minutes, 52 seconds
18	Online	1 day, 10 hours, 12 minutes, 52 seconds
19	Online	1 day, 10 hours, 12 minutes, 52 seconds
20	Online	1 day, 10 hours, 12 minutes, 52 seconds
21	Online	1 day, 10 hours, 12 minutes, 52 seconds

## show chassis fabric summary extended (MX10003 Router)

user@host&gt; show chassis fabric summary extended

Plane	State	Link Error	Link TF	Destination errors Local / Remote	Uptime
0	Online	NO	NO	NO/ NO	1 day, 10 hours, 14 minutes, 26 seconds
1	Online	NO	NO	NO/ NO	1 day, 10 hours, 14 minutes, 26 seconds
2	Online	NO	NO	NO/ NO	1 day, 10 hours, 14 minutes, 26 seconds
3	Online	NO	NO	NO/ NO	1 day, 10 hours, 14 minutes, 26 seconds
4	Online	NO	NO	NO/ NO	1 day, 10 hours, 14 minutes, 26 seconds
5	Online	NO	NO	NO/ NO	1 day, 10 hours, 14 minutes, 26 seconds
6	Online	NO	NO	NO/ NO	1 day, 10 hours, 14 minutes, 26 seconds
7	Online	NO	NO	NO/ NO	1 day, 10 hours, 14 minutes, 26 seconds
8	Online	NO	NO	NO/ NO	1 day, 10 hours, 14 minutes, 26 seconds
9	Online	NO	NO	NO/ NO	1 day, 10 hours, 14 minutes, 26 seconds
10	Online	NO	NO	NO/ NO	1 day, 10 hours, 14 minutes, 26 seconds
11	Online	NO	NO	NO/ NO	1 day, 10 hours, 14 minutes, 26 seconds

12	Online	NO	NO	NO/	NO	1 day, 10 hours, 14 minutes, 26 seconds
13	Online	NO	NO	NO/	NO	1 day, 10 hours, 14 minutes, 26 seconds
14	Online	NO	NO	NO/	NO	1 day, 10 hours, 14 minutes, 26 seconds
15	Online	NO	NO	NO/	NO	1 day, 10 hours, 14 minutes, 26 seconds
16	Online	NO	NO	NO/	NO	1 day, 10 hours, 14 minutes, 26 seconds
17	Online	NO	NO	NO/	NO	1 day, 10 hours, 14 minutes, 26 seconds
18	Online	NO	NO	NO/	NO	1 day, 10 hours, 14 minutes, 26 seconds
19	Online	NO	NO	NO/	NO	1 day, 10 hours, 14 minutes, 26 seconds
20	Online	NO	NO	NO/	NO	1 day, 10 hours, 14 minutes, 26 seconds
21	Online	NO	NO	NO/	NO	1 day, 10 hours, 14 minutes, 26 seconds

## show chassis fabric topology

<b>List of Syntax</b>	<a href="#">Syntax on page 1586</a> <a href="#">Syntax (TX Matrix Router) on page 1586</a> <a href="#">Syntax (TX Matrix Plus Router) on page 1586</a> <a href="#">Syntax (T4000 Core Router) on page 1586</a> <a href="#">Syntax (PTX Series Packet Transport Routers) on page 1586</a> <a href="#">Syntax (QTX Series Switches) on page 1586</a>
<b>Syntax</b>	<pre>show chassis fabric topology &lt;lcc number   scc&gt; &lt;sib-slot&gt;</pre>
<b>Syntax (TX Matrix Router)</b>	<pre>show chassis fabric topology &lt;lcc number   scc&gt; &lt;sib-slot&gt;</pre>
<b>Syntax (TX Matrix Plus Router)</b>	<pre>show chassis fabric topology &lt;lcc number   sfc number&gt; &lt;sib-slot&gt;</pre>
<b>Syntax (T4000 Core Router)</b>	<pre>show chassis fabric topology &lt;sib-slot&gt;</pre>
<b>Syntax (PTX Series Packet Transport Routers)</b>	<pre>show chassis fabric topology</pre>
<b>Syntax (QTX Series Switches)</b>	<pre>show chassis fabric topology</pre>
<b>Release Information</b>	<p>Command introduced before Junos OS Release 7.4.</p> <p><b>sfc</b> option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Routers.</p> <p>Command introduced in Junos OS Release 15.1X53-D30 for QFX Series switches.</p> <p>Command introduced in Junos OS Release 17.2 for PTX10008 Routers.</p>
<b>Description</b>	<p>(TX Matrix routers only) Display the state of the switching fabric topology for the Switch Interface Board (SIB) connection between the TX Matrix router and the T640 routers.</p> <p>(TX Matrix Plus routers only) Display the state of the switching fabric topology for the SIB connection between the TX Matrix Plus router and the connected routers.</p> <p>(T320, T640, T1600, and T4000 routers only) Display the state of the switching fabric topology for the connection between the Switch Interface Board (SIB) and the FPCs.</p>

(PTX Series Packet Transport Routers and QFX Series switches) Display the input-output link topology.

**Options** **none**—(TX Matrix routers only) Display the state of the switching fabric topology for the Switch Interface Board (SIB) connection between the TX Matrix router and the T640 routers.

(TX Matrix Plus routers only) Display the state of the switching fabric topology for the SIB connection between the TX Matrix Plus router and the connected routers.

(T320, T640, T1600, and T4000 routers only) Display the state of the switching fabric topology for the connection between the Switch Interface Board (SIB) and the FPCs.

(QFX Series switches) Display the input-output link topology.

**lcc number**—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display the fabric topology state for a specified T640 router (line-card chassis) that is connected to a TX Matrix router. On a TX Matrix Plus router, display the fabric topology state for a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**scc**—(TX Matrix routers only) (Optional) Display the fabric topology state for the TX Matrix router (or switch-card chassis).

**sfc number**—(TX Matrix Plus routers only) (Optional) Display the fabric topology for the switch-fabric chassis. Replace *number* with 0.

**sib-slot**—(Optional) Display the fabric topology state for a specified SIB slot. Replace *sib-slot* with a value from 0 through 4. On a TX Matrix Plus router, replace *sib-slot* with a value from 0 through 15.

**Required Privilege Level** view

**Related Documentation** • *Layer 2 Wholesale Network Topology Overview*

- List of Sample Output**
- [show chassis fabric topology scc \(TX Matrix Router\) on page 1591](#)
  - [show chassis fabric topology lcc on page 1593](#)
  - [show chassis fabric topology \(TX Matrix Plus Router\) on page 1595](#)
  - [show chassis fabric topology sfc \(TX Matrix Plus Router\) on page 1596](#)
  - [show chassis fabric topology lcc \(TX Matrix Plus Router\) on page 1597](#)
  - [show chassis fabric topology \(T4000 Core Router\) on page 1598](#)
  - [show chassis fabric topology lcc \(TX Matrix Plus Router with 3D SIBs\) on page 1599](#)
  - [show chassis fabric topology sfc \(TX Matrix Plus Router with 3D SIBs\) on page 1601](#)
  - [show chassis fabric topology \(PTX5000 Router\) on page 1606](#)
  - [show chassis fabric topology \(PTX3000 Router\) on page 1609](#)
  - [show chassis fabric topology \(PTX10008 Router\) on page 1616](#)
  - [show chassis fabric topology \(QFX10008 Switch\) on page 1620](#)

**Output Fields** [Table 133 on page 1588](#) lists the output fields for the **show chassis fabric topology** command. Output fields are listed in the approximate order in which they appear.

*Table 133: show chassis fabric topology Output Fields*

Field Name	Field Description
<b>in-links</b>	Fabric topology for receive side links.
<b>out-links</b>	Fabric topology for transmit side links.
<b>state</b>	<p>State of the fabric link:</p> <ul style="list-style-type: none"> <li>• <b>RESET</b>—Link between the SIB and the FPC/DPC is powered down on purpose. This is done in all non-dual Packet Forwarding Engine–based boards.</li> <li>• <b>UP</b>—Link between the SIB and the FPC/DCP is up and running.</li> <li>• <b>DOWN</b>—Link between the SIB and the FPC/DCP is powered down.</li> <li>• <b>FAULT</b>—The SIB is in the alarmed state, in which the SIB’s plane is not operational for one or more of the following reasons: <ul style="list-style-type: none"> <li>• On-board F-chip is not operational.</li> <li>• Fiber-optic connector faults.</li> <li>• FPC connector faults.</li> <li>• SIB midplane connector faults.</li> </ul> </li> </ul> <p><b>NOTE:</b> The following state descriptions are applicable only to PTX Series Packet Transport Routers.</p> <ul style="list-style-type: none"> <li>• <b>OK</b>—The link between the SIB and the FPC is operational.</li> <li>• <b>Down</b>—The link between the SIB and the FPC is powered down.</li> <li>• <b>Error</b>—The CCL link between the SIB and FPC is not operational for one or more of the following reasons: <ul style="list-style-type: none"> <li>• FPC midplane connector failure.</li> <li>• SIB midplane connector failure.</li> <li>• CCL link CRC error.</li> </ul> </li> </ul>

**Table 133: show chassis fabric topology Output Fields (continued)**

<b>Out-Links:</b> and <b>In-Links</b> (TX Matrix Plus router only)	<p>State of the links from the F13 SIB to the LCC or vice-versa. Out-Links indicate Tx links. In-Links indicate an Rx link. The following additional fields are displayed for each SIB:</p> <ul style="list-style-type: none"> <li>• <b>VCSEL Status</b>—Optical (VCSEL channel) link status for the corresponding electrical (HSL2) link. The states include: <ul style="list-style-type: none"> <li>• <b>OK</b>—Optical signal power is good.</li> <li>• <b>Error</b>—Internal error.</li> <li>• <b>LOS</b>—Loss of Signal detected.</li> <li>• <b>High Cur</b>—The Tx Bias-current is higher than threshold on this channel. This is applicable only to Tx Channels.</li> <li>• <b>Low Cur</b>—The Tx Bias-current is lower than threshold on this channel. This is applicable only to Tx Channels.</li> </ul> </li> <li>• <b>HSL2 Channel</b>—HSL2 is the electrical link used to connect ASICs to the in-link and out-link. The channel number corresponds to the link and varies based on the ASIC or configuration.</li> </ul> <hr/> <ul style="list-style-type: none"> <li>• <b>HSL2 Status</b> —The status of the HSL2 Channel. Includes the following states: <ul style="list-style-type: none"> <li>• <b>Up</b>—Channel is up.</li> <li>• <b>Down</b>—Channel is down.</li> <li>• <b>Reset</b>—Channel has been reset.</li> <li>• <b>Fault</b>—Channel has faults.</li> </ul> </li> </ul>
---	--

The following is a representation of display output for links originating from the SIBs (LCC or SFC)

```
SF_[1|3]_port#_FB_[A-D] (VCSEL#, fiber)
```

- **SF\_[1|3]**—Name of the ASIC, with Fabric F1 or F3 mode.
- **port#**—HSL2 port number on the SF ASIC in the LCC.
- **FB\_[A-D]**—via fiber bundle A, B, C or D.
- **VCSEL#**—VCSEL module number on SIB.
- **fiber**—Fiber channel number.

The following is a representation of display output for links originating from the SIBs (LCC or SFC)

```
SF_[1|3]_port#_FB_[A-D] (VCSEL#, fiber)
```

- **SF\_[1|3]**—Name of the ASIC, with Fabric F1 or F3 mode.
- **port#**—HSL2 port number on the SF ASIC in the LCC.
- **FB\_[A-D]**—via fiber bundle A, B, C or D.
- **VCSEL#**—VCSEL module number on SIB.
- **fiber**—Fiber channel number.

The following is a sample output with description of the fields displayed in the output for Out-Links:

```
Out-Links:
```

```
=====
```

```
SF_30_13_FB_A(21,09) -> FPC7_B_SG(3,3,6)_FB_A(18,09)      OK      203      Up
```

**Table 133: show chassis fabric topology Output Fields (continued)**

- **SF\_30\_13**—Name of the ASIC, with Fabric F1 or F3 mode. In this case, 3 is the F3 direction and is used in the Tx path and 0 identifies the serial link on the SF chip (in this case, link goes to sf-3 chip number 0). You can also have F1 mode and Rx path instead.
- **FB\_A (21, 09)**—Fiber bundle A, with VCSEL unit number 21 within the SIB, and channel number 9 within the unit number.
- **FPC7\_B\_SG(3,3,6)**—FPC 7.with bottom Packet Forwarding Engine (T for top PFE and B for bottom PFE), SG ASIC, with number 3 and port number 3, with HSL2 link number with the SIB as 6.
- **FB\_A(18, 09)**—Fiber Bundle, with VCSEL unit number 18 within the SIB, and VCSEL channel number 9 within the unit number.

The following is a representation of display output for links originating from the FPCs (In-Links)

```
FPC#[T|B]_SG(ASIC#, port#, HSL2_bit)_FB_[A-D](VCSEL#, fiber)
```

- **FPC#**—FPC number with PFE (0 or 1).
- **T**—Top Packet Forwarding Engine.
- **B**—Bottom Packet Forwarding Engine.
- **SG(ASIC#, port#, HSL2\_bit)**—SG ASIC information (ASIC 0-3, port 0-3, HSL2\_bit 0-7).
- **FB\_[A-D]**—via fiber bundle A, B, C or D.
- **VCSEL#**—VCSEL module number on SIB.
- **fiber**—Fiber channel number.

The following is a representation of display output for links originating from the FPCs (In-Links)

```
FPC#[T|B]_SG(ASIC#, port#, HSL2_bit)_FB_[A-D](VCSEL#, fiber)
```

- **FPC#**—FPC number with PFE (0 or 1).
- **T**—Top Packet Forwarding Engine.
- **B**—Bottom Packet Forwarding Engine.
- **SG(ASIC#, port#, HSL2\_bit)**—SG ASIC information (ASIC 0-3, port 0-3, HSL2\_bit 0-7).
- **FB\_[A-D]**—via fiber bundle A, B, C or D.
- **VCSEL#**—VCSEL module number on SIB.
- **fiber**—Fiber channel number.

The following is a sample output with description of the fields displayed in the output for In-Links:

```
In-Links :
```

```
=====
```

```
FPC0_T_SG(0,0,0)_FB_D(04,11)  -> SF_10_00_FB_D(01,11)      OK      0      Up
```

- **FPC0**—FPC 0.
- **T**—Top Packet Forwarding Engine.
- **SG (0, 0, 0)**—SG ASIC with port number 0 and link 0.
- **FB\_D (04,11)**—Fiber Bundle D with VCSEL 4, channel 11.
- **SF\_10**—Indicates F1 mode chip number 0 and Rx path.
- **SF\_10\_00\_FB\_D(01,11)**—Indicates F1 mode chip number 0 and Rx path with port 0, fiber bundle D, with VCSEL 1, channel 11.



**Table 133: show chassis fabric topology Output Fields (continued)**

**Out-links and In-links**  
(TX Matrix Plus router with 3D SIBs only)

State of the links from the F13 SIB to the SFC/LCC or vice-versa. Out-Links indicate Tx links. In-Links indicate an Rx link. The following additional fields are displayed for each SIB:

- Description of the fields displayed in the output for **In-links** and **Out-links** for SFC:

In-links	State	Out-links	State
CXP0_Evn->F13_SIB0_XF2,04_0	Up	F13_SIB0_XF2,04_0->CXP0_Evn	Up

- **CXP0\_Evn**—CXP optics with type of port bits such as even or odd. In this case, it indicates CXP optics with even port bit number 0.
- **F13\_SIB0**—Name of the SFC data plane SIB with the SIB number. In this case, it indicates F13 SIB with number 0.
- **XF2,04\_0**—Name of the ASIC with port and subchannel number. In this case, it Indicates XF2 chip with port number 4 and subchannel number 0.
- Description of the fields displayed in the output for **In-links** and **Out-links** for LCC:

In-links	State	Out-links	State
CXP0_Evn->LCC_SIB0_XF3,10_0	Up	LCC_SIB0_XF3,10_0->CXP0_Evn	Up

- **CXP0\_Evn**—CXP optics with the type of port bits such as even or odd. In this case, it indicates CXP optics with even port bit number 0.
- **LCC\_SIB0**—LCC SIB number. In this case, it indicates LCC SIB with number 0.
- **XF3,10\_0**—Name of the ASIC with port and subchannel number. In this case, it Indicates XF3 with port number 10 and subchannel number 0.

## Sample Output

### show chassis fabric topology scc (TX Matrix Router)

```
user@host> show chassis fabric topology scc
```

```
scc-rel:
```

```
fchip (mode)
```

```
in-links      state  out-links      state
```

```
Sib #0 :
```

```
SIB0_F0 (F2 ):
```

```
LCC0_SIB-L0_F0,03->SIB-S0_F0,00  UP
```

```
LCC1_SIB-L0_F0,03->SIB-S0_F0,01  UP
```

```
SIB-S0_F0,00->LCC0_SIB-L0_F1,00  UP
```

```
SIB-S0_F0,01->LCC1_SIB-L0_F1,08  UP
```

LCC2_SIB-L0_F0,03->SIB-S0_F0,02	RESET	SIB-S0_F0,02->LCC2_SIB-L0_F1,08	UP
LCC3_SIB-L0_F0,03->SIB-S0_F0,03	RESET	SIB-S0_F0,03->LCC3_SIB-L0_F1,00	UP
LCC0_SIB-L0_F0,02->SIB-S0_F0,04	UP	SIB-S0_F0,04->LCC0_SIB-L0_F1,01	UP
LCC1_SIB-L0_F0,02->SIB-S0_F0,05	UP	SIB-S0_F0,05->LCC1_SIB-L0_F1,09	UP
LCC2_SIB-L0_F0,02->SIB-S0_F0,06	RESET	SIB-S0_F0,06->LCC2_SIB-L0_F1,09	UP
LCC3_SIB-L0_F0,02->SIB-S0_F0,07	RESET	SIB-S0_F0,07->LCC3_SIB-L0_F1,01	UP
LCC0_SIB-L0_F0,07->SIB-S0_F0,08	UP	SIB-S0_F0,08->LCC0_SIB-L0_F1,04	UP
LCC1_SIB-L0_F0,07->SIB-S0_F0,09	UP	SIB-S0_F0,09->LCC1_SIB-L0_F1,12	UP
LCC2_SIB-L0_F0,07->SIB-S0_F0,10	RESET	SIB-S0_F0,10->LCC2_SIB-L0_F1,12	UP
LCC3_SIB-L0_F0,07->SIB-S0_F0,11	RESET	SIB-S0_F0,11->LCC3_SIB-L0_F1,04	UP
LCC0_SIB-L0_F0,06->SIB-S0_F0,12	UP	SIB-S0_F0,12->LCC0_SIB-L0_F1,05	UP
LCC1_SIB-L0_F0,06->SIB-S0_F0,13	UP	SIB-S0_F0,13->LCC1_SIB-L0_F1,13	UP
LCC2_SIB-L0_F0,06->SIB-S0_F0,14	RESET	SIB-S0_F0,14->LCC2_SIB-L0_F1,13	UP
LCC3_SIB-L0_F0,06->SIB-S0_F0,15	RESET	SIB-S0_F0,15->LCC3_SIB-L0_F1,05	UP
SIB0_F1 (F2 ):			
LCC0_SIB-L0_F0,11->SIB-S0_F1,00	UP	SIB-S0_F1,00->LCC0_SIB-L0_F1,08	UP
LCC1_SIB-L0_F0,11->SIB-S0_F1,01	UP	SIB-S0_F1,01->LCC1_SIB-L0_F1,00	UP
LCC2_SIB-L0_F0,11->SIB-S0_F1,02	RESET	SIB-S0_F1,02->LCC2_SIB-L0_F1,00	UP
LCC3_SIB-L0_F0,11->SIB-S0_F1,03	RESET	SIB-S0_F1,03->LCC3_SIB-L0_F1,08	UP
LCC0_SIB-L0_F0,10->SIB-S0_F1,04	UP	SIB-S0_F1,04->LCC0_SIB-L0_F1,09	UP
LCC1_SIB-L0_F0,10->SIB-S0_F1,05	UP	SIB-S0_F1,05->LCC1_SIB-L0_F1,01	UP
LCC2_SIB-L0_F0,10->SIB-S0_F1,06	RESET	SIB-S0_F1,06->LCC2_SIB-L0_F1,01	UP
LCC3_SIB-L0_F0,10->SIB-S0_F1,07	RESET	SIB-S0_F1,07->LCC3_SIB-L0_F1,09	UP
LCC0_SIB-L0_F0,15->SIB-S0_F1,08	UP	SIB-S0_F1,08->LCC0_SIB-L0_F1,12	UP
LCC1_SIB-L0_F0,15->SIB-S0_F1,09	UP	SIB-S0_F1,09->LCC1_SIB-L0_F1,04	UP
LCC2_SIB-L0_F0,15->SIB-S0_F1,10	RESET	SIB-S0_F1,10->LCC2_SIB-L0_F1,04	UP
LCC3_SIB-L0_F0,15->SIB-S0_F1,11	RESET	SIB-S0_F1,11->LCC3_SIB-L0_F1,12	UP
LCC0_SIB-L0_F0,14->SIB-S0_F1,12	UP	SIB-S0_F1,12->LCC0_SIB-L0_F1,13	UP
LCC1_SIB-L0_F0,14->SIB-S0_F1,13	UP	SIB-S0_F1,13->LCC1_SIB-L0_F1,05	UP
LCC2_SIB-L0_F0,14->SIB-S0_F1,14	RESET	SIB-S0_F1,14->LCC2_SIB-L0_F1,05	
UP			
LCC3_SIB-L0_F0,14->SIB-S0_F1,15	RESET	SIB-S0_F1,15->LCC3_SIB-L0_F1,13	
UP			
SIB0_F2 (F2 ):			
LCC3_SIB-L0_F0,13->SIB-S0_F2,00	RESET	SIB-S0_F2,00->LCC3_SIB-L0_F1,14	UP
LCC2_SIB-L0_F0,13->SIB-S0_F2,01	RESET	SIB-S0_F2,01->LCC2_SIB-L0_F1,06	
UP			
LCC1_SIB-L0_F0,13->SIB-S0_F2,02	UP	SIB-S0_F2,02->LCC1_SIB-L0_F1,06	UP
LCC0_SIB-L0_F0,13->SIB-S0_F2,03	UP	SIB-S0_F2,03->LCC0_SIB-L0_F1,14	UP
LCC3_SIB-L0_F0,12->SIB-S0_F2,04	RESET	SIB-S0_F2,04->LCC3_SIB-L0_F1,15	
UP			
LCC2_SIB-L0_F0,12->SIB-S0_F2,05	RESET	SIB-S0_F2,05->LCC2_SIB-L0_F1,07	UP
LCC1_SIB-L0_F0,12->SIB-S0_F2,06	UP	SIB-S0_F2,06->LCC1_SIB-L0_F1,07	UP
LCC0_SIB-L0_F0,12->SIB-S0_F2,07	UP	SIB-S0_F2,07->LCC0_SIB-L0_F1,15	UP
LCC3_SIB-L0_F0,09->SIB-S0_F2,08	RESET	SIB-S0_F2,08->LCC3_SIB-L0_F1,10	
UP			
LCC2_SIB-L0_F0,09->SIB-S0_F2,09	RESET	SIB-S0_F2,09->LCC2_SIB-L0_F1,02	
UP			
LCC1_SIB-L0_F0,09->SIB-S0_F2,10	UP	SIB-S0_F2,10->LCC1_SIB-L0_F1,02	UP
LCC0_SIB-L0_F0,09->SIB-S0_F2,11	UP	SIB-S0_F2,11->LCC0_SIB-L0_F1,10	UP
LCC3_SIB-L0_F0,08->SIB-S0_F2,12	RESET	SIB-S0_F2,12->LCC3_SIB-L0_F1,11	
UP			
LCC2_SIB-L0_F0,08->SIB-S0_F2,13	RESET	SIB-S0_F2,13->LCC2_SIB-L0_F1,03	
UP			
LCC1_SIB-L0_F0,08->SIB-S0_F2,14	UP	SIB-S0_F2,14->LCC1_SIB-L0_F1,03	UP
LCC0_SIB-L0_F0,08->SIB-S0_F2,15	UP	SIB-S0_F2,15->LCC0_SIB-L0_F1,11	UP
SIB0_F3 (F2 ):			
LCC3_SIB-L0_F0,05->SIB-S0_F3,00	RESET	SIB-S0_F3,00->LCC3_SIB-L0_F1,06	
UP			
LCC2_SIB-L0_F0,05->SIB-S0_F3,01	RESET	SIB-S0_F3,01->LCC2_SIB-L0_F1,14	

```

UP
LCC1_SIB-L0_F0,05->SIB-S0_F3,02 UP      SIB-S0_F3,02->LCC1_SIB-L0_F1,14 UP
LCC0_SIB-L0_F0,05->SIB-S0_F3,03 UP      SIB-S0_F3,03->LCC0_SIB-L0_F1,06 UP
LCC3_SIB-L0_F0,04->SIB-S0_F3,04 RESET    SIB-S0_F3,04->LCC3_SIB-L0_F1,07
UP
LCC2_SIB-L0_F0,04->SIB-S0_F3,05 RESET    SIB-S0_F3,05->LCC2_SIB-L0_F1,15
UP
LCC1_SIB-L0_F0,04->SIB-S0_F3,06 UP      SIB-S0_F3,06->LCC1_SIB-L0_F1,15 UP
LCC0_SIB-L0_F0,04->SIB-S0_F3,07 UP      SIB-S0_F3,07->LCC0_SIB-L0_F1,07 UP
LCC3_SIB-L0_F0,01->SIB-S0_F3,08 RESET    SIB-S0_F3,08->LCC3_SIB-L0_F1,02
UP
LCC2_SIB-L0_F0,01->SIB-S0_F3,09 RESET    SIB-S0_F3,09->LCC2_SIB-L0_F1,10
UP
LCC1_SIB-L0_F0,01->SIB-S0_F3,10 UP      SIB-S0_F3,10->LCC1_SIB-L0_F1,10 UP
LCC0_SIB-L0_F0,01->SIB-S0_F3,11 UP      SIB-S0_F3,11->LCC0_SIB-L0_F1,02 UP
LCC3_SIB-L0_F0,00->SIB-S0_F3,12 RESET    SIB-S0_F3,12->LCC3_SIB-L0_F1,03
UP
LCC2_SIB-L0_F0,00->SIB-S0_F3,13 RESET    SIB-S0_F3,13->LCC2_SIB-L0_F1,11
UP
LCC1_SIB-L0_F0,00->SIB-S0_F3,14 UP      SIB-S0_F3,14->LCC1_SIB-L0_F1,11 UP
LCC0_SIB-L0_F0,00->SIB-S0_F3,15 UP      SIB-S0_F3,15->LCC0_SIB-L0_F1,03 UP
Sib #1 :
-----
SIB1_F0 (F2 ):
LCC0_SIB-L1_F0,03->SIB-S1_F0,00 RESET    SIB-S1_F0,00->LCC0_SIB-L1_F1,00 UP
LCC1_SIB-L1_F0,03->SIB-S1_F0,01 RESET    SIB-S1_F0,01->LCC1_SIB-L1_F1,08 UP
LCC2_SIB-L1_F0,03->SIB-S1_F0,02 RESET    SIB-S1_F0,02->LCC2_SIB-L1_F1,08 UP
LCC3_SIB-L1_F0,03->SIB-S1_F0,03 RESET    SIB-S1_F0,03->LCC3_SIB-L1_F1,00 UP
LCC0_SIB-L1_F0,02->SIB-S1_F0,04 RESET    SIB-S1_F0,04->LCC0_SIB-L1_F1,01 UP
LCC1_SIB-L1_F0,02->SIB-S1_F0,05 RESET    SIB-S1_F0,05->LCC1_SIB-L1_F1,09 UP
LCC2_SIB-L1_F0,02->SIB-S1_F0,06 RESET    SIB-S1_F0,06->LCC2_SIB-L1_F1,09 UP
LCC3_SIB-L1_F0,02->SIB-S1_F0,07 RESET    SIB-S1_F0,07->LCC3_SIB-L1_F1,01 UP
LCC0_SIB-L1_F0,07->SIB-S1_F0,08 RESET    SIB-S1_F0,08->LCC0_SIB-L1_F1,04 UP
LCC1_SIB-L1_F0,07->SIB-S1_F0,09 RESET    SIB-S1_F0,09->LCC1_SIB-L1_F1,12 UP
LCC2_SIB-L1_F0,07->SIB-S1_F0,10 RESET    SIB-S1_F0,10->LCC2_SIB-L1_F1,12 UP
LCC3_SIB-L1_F0,07->SIB-S1_F0,11 RESET    SIB-S1_F0,11->LCC3_SIB-L1_F1,04 UP
LCC0_SIB-L1_F0,06->SIB-S1_F0,12 RESET    SIB-S1_F0,12->LCC0_SIB-L1_F1,05 UP
LCC1_SIB-L1_F0,06->SIB-S1_F0,13 RESET    SIB-S1_F0,13->LCC1_SIB-L1_F1,13 UP
LCC2_SIB-L1_F0,06->SIB-S1_F0,14 RESET    SIB-S1_F0,14->LCC2_SIB-L1_F1,13 UP
LCC3_SIB-L1_F0,06->SIB-S1_F0,15 RESET    SIB-S1_F0,15->LCC3_SIB-L1_F1,05 UP
SIB1_F1 (F2 ):
LCC0_SIB-L1_F0,11->SIB-S1_F1,00 RESET    SIB-S1_F1,00->LCC0_SIB-L1_F1,08 UP
LCC1_SIB-L1_F0,11->SIB-S1_F1,01 RESET    SIB-S1_F1,01->LCC1_SIB-L1_F1,00 UP
LCC2_SIB-L1_F0,11->SIB-S1_F1,02 RESET    SIB-S1_F1,02->LCC2_SIB-L1_F1,00 UP
LCC3_SIB-L1_F0,11->SIB-S1_F1,03 RESET    SIB-S1_F1,03->LCC3_SIB-L1_F1,08 UP
LCC0_SIB-L1_F0,10->SIB-S1_F1,04 RESET    SIB-S1_F1,04->LCC0_SIB-L1_F1,09 UP
LCC1_SIB-L1_F0,10->SIB-S1_F1,05 RESET    SIB-S1_F1,05->LCC1_SIB-L1_F1,01 UP
LCC2_SIB-L1_F0,10->SIB-S1_F1,06 RESET    SIB-S1_F1,06->LCC2_SIB-L1_F1,01 UP
LCC3_SIB-L1_F0,10->SIB-S1_F1,07 RESET    SIB-S1_F1,07->LCC3_SIB-L1_F1,09 UP
LCC0_SIB-L1_F0,15->SIB-S1_F1,08 RESET    SIB-S1_F1,08->LCC0_SIB-L1_F1,12 UP
LCC1_SIB-L1_F0,15->SIB-S1_F1,09 RESET    SIB-S1_F1,09->LCC1_SIB-L1_F1,04 UP
LCC2_SIB-L1_F0,15->SIB-S1_F1,10 RESET    SIB-S1_F1,10->LCC2_SIB-L1_F1,04 UP
LCC3_SIB-L1_F0,15->SIB-S1_F1,11 RESET    SIB-S1_F1,11->LCC3_SIB-L1_F1,12,05 UP
LCC0_SIB-L1_F0,14->SIB-S1_F1,12 RESET    SIB-S1_F1,12->LCC0_SIB-L1_F1,13 UP
LCC1_SIB-L1_F0,14->SIB-S1_F1,13 RESET    SIB-S1_F1,13->LCC1_SIB-L1_F1,05 UP
LCC2_SIB-L1_F0,14->SIB-S1_F1,14 RESET    SIB-S1_F1,14->LCC2_SIB-L1_F1,05 UP

```

### show chassis fabric topology lcc

```
user@host> show chassis fabric topology lcc 0
```

1cc0-re0:

fchip (mode)			
in-links	state	out-links	state

Sib #2 :

-----  
SIB2\_F0 (F1 ):

FPC0_T->SIB-L2_F0,00	DOWN	SIB-L2_F0,00->SIB-S2_F3,15	DOWN
FPC0_B->SIB-L2_F0,01	UP	SIB-L2_F0,01->SIB-S2_F3,11	DOWN
FPC1_T->SIB-L2_F0,02	DOWN	SIB-L2_F0,02->SIB-S2_F0,04	DOWN
FPC1_B->SIB-L2_F0,03	DOWN	SIB-L2_F0,03->SIB-S2_F0,00	DOWN
FPC2_T->SIB-L2_F0,04	DOWN	SIB-L2_F0,04->SIB-S2_F3,07	DOWN
FPC2_B->SIB-L2_F0,05	DOWN	SIB-L2_F0,05->SIB-S2_F3,03	DOWN
FPC3_T->SIB-L2_F0,06	DOWN	SIB-L2_F0,06->SIB-S2_F0,12	DOWN
FPC3_B->SIB-L2_F0,07	DOWN	SIB-L2_F0,07->SIB-S2_F0,08	DOWN
FPC4_T->SIB-L2_F0,08	DOWN	SIB-L2_F0,08->SIB-S2_F2,15	DOWN
FPC4_B->SIB-L2_F0,09	DOWN	SIB-L2_F0,09->SIB-S2_F2,11	DOWN
FPC5_T->SIB-L2_F0,10	DOWN	SIB-L2_F0,10->SIB-S2_F1,04	DOWN
FPC5_B->SIB-L2_F0,11	DOWN	SIB-L2_F0,11->SIB-S2_F1,00	DOWN
FPC6_T->SIB-L2_F0,12	DOWN	SIB-L2_F0,12->SIB-S2_F2,07	DOWN
FPC6_B->SIB-L2_F0,13	UP	SIB-L2_F0,13->SIB-S2_F2,03	DOWN
FPC7_T->SIB-L2_F0,14	DOWN	SIB-L2_F0,14->SIB-S2_F1,12	DOWN
FPC7_B->SIB-L2_F0,15	DOWN	SIB-L2_F0,15->SIB-S2_F1,08	DOWN

SIB2\_F1 (F3 ):

SIB-S2_F0,00->SIB-L2_F1,00	UP	SIB-L2_F1,00->FPC7_B	DOWN
SIB-S2_F0,04->SIB-L2_F1,01	UP	SIB-L2_F1,01->FPC7_T	DOWN
SIB-S2_F3,11->SIB-L2_F1,02	UP	SIB-L2_F1,02->FPC6_B	DOWN
SIB-S2_F3,15->SIB-L2_F1,03	UP	SIB-L2_F1,03->FPC6_T	DOWN
SIB-S2_F0,08->SIB-L2_F1,04	UP	SIB-L2_F1,04->FPC5_B	DOWN
SIB-S2_F0,12->SIB-L2_F1,05	UP	SIB-L2_F1,05->FPC5_T	DOWN
SIB-S2_F3,03->SIB-L2_F1,06	UP	SIB-L2_F1,06->FPC4_B	DOWN
SIB-S2_F3,07->SIB-L2_F1,07	UP	SIB-L2_F1,07->FPC4_T	DOWN
SIB-S2_F1,00->SIB-L2_F1,08	UP	SIB-L2_F1,08->FPC3_B	DOWN
SIB-S2_F1,04->SIB-L2_F1,09	UP	SIB-L2_F1,09->FPC3_T	DOWN
SIB-S2_F2,11->SIB-L2_F1,10	UP	SIB-L2_F1,10->FPC2_B	DOWN
SIB-S2_F2,15->SIB-L2_F1,11	UP	SIB-L2_F1,11->FPC2_T	DOWN
SIB-S2_F1,08->SIB-L2_F1,12	UP	SIB-L2_F1,12->FPC1_B	DOWN
SIB-S2_F1,12->SIB-L2_F1,13	UP	SIB-L2_F1,13->FPC1_T	DOWN
SIB-S2_F2,03->SIB-L2_F1,14	UP	SIB-L2_F1,14->FPC0_B	DOWN
SIB-S2_F2,07->SIB-L2_F1,15	UP	SIB-L2_F1,15->FPC0_T	DOWN

Sib #4 :

-----  
SIB4\_F0 (F1 ):

FPC0_T->SIB-L4_F0,00	RESET	SIB-L4_F0,00->SIB-S4_F3,15	UP
FPC0_B->SIB-L4_F0,01	UP	SIB-L4_F0,01->SIB-S4_F3,11	UP
FPC1_T->SIB-L4_F0,02	RESET	SIB-L4_F0,02->SIB-S4_F0,04	UP
FPC1_B->SIB-L4_F0,03	RESET	SIB-L4_F0,03->SIB-S4_F0,00	UP
FPC2_T->SIB-L4_F0,04	RESET	SIB-L4_F0,04->SIB-S4_F3,07	UP
FPC2_B->SIB-L4_F0,05	RESET	SIB-L4_F0,05->SIB-S4_F3,03	UP
FPC3_T->SIB-L4_F0,06	RESET	SIB-L4_F0,06->SIB-S4_F0,12	UP
FPC3_B->SIB-L4_F0,07	RESET	SIB-L4_F0,07->SIB-S4_F0,08	UP
FPC4_T->SIB-L4_F0,08	RESET	SIB-L4_F0,08->SIB-S4_F2,15	UP
FPC4_B->SIB-L4_F0,09	RESET	SIB-L4_F0,09->SIB-S4_F2,11	UP
FPC5_T->SIB-L4_F0,10	RESET	SIB-L4_F0,10->SIB-S4_F1,04	UP
FPC5_B->SIB-L4_F0,11	RESET	SIB-L4_F0,11->SIB-S4_F1,00	UP
FPC6_T->SIB-L4_F0,12	RESET	SIB-L4_F0,12->SIB-S4_F2,07	UP
FPC6_B->SIB-L4_F0,13	UP	SIB-L4_F0,13->SIB-S4_F2,03	UP
FPC7_T->SIB-L4_F0,14	RESET	SIB-L4_F0,14->SIB-S4_F1,12	UP
FPC7_B->SIB-L4_F0,15	RESET	SIB-L4_F0,15->SIB-S4_F1,08	UP

```

SIB4_F1 (F3 ):
SIB-S4_F0,00->SIB-L4_F1,00 UP      SIB-L4_F1,00->FPC7_B      UP
SIB-S4_F0,04->SIB-L4_F1,01 UP      SIB-L4_F1,01->FPC7_T      UP
SIB-S4_F3,11->SIB-L4_F1,02 UP      SIB-L4_F1,02->FPC6_B      UP
SIB-S4_F3,15->SIB-L4_F1,03 UP      SIB-L4_F1,03->FPC6_T      UP
SIB-S4_F0,08->SIB-L4_F1,04 UP      SIB-L4_F1,04->FPC5_B      UP
SIB-S4_F0,12->SIB-L4_F1,05 UP      SIB-L4_F1,05->FPC5_T      UP
SIB-S4_F3,03->SIB-L4_F1,06 UP      SIB-L4_F1,06->FPC4_B      UP
SIB-S4_F3,07->SIB-L4_F1,07 UP      SIB-L4_F1,07->FPC4_T      UP
SIB-S4_F1,00->SIB-L4_F1,08 UP      SIB-L4_F1,08->FPC3_B      UP
SIB-S4_F1,04->SIB-L4_F1,09 UP      SIB-L4_F1,09->FPC3_T      UP
SIB-S4_F2,11->SIB-L4_F1,10 UP      SIB-L4_F1,10->FPC2_B      UP
SIB-S4_F2,15->SIB-L4_F1,11 UP      SIB-L4_F1,11->FPC2_T      UP
SIB-S4_F1,08->SIB-L4_F1,12 UP      SIB-L4_F1,12->FPC1_B      UP
SIB-S4_F1,12->SIB-L4_F1,13 UP      SIB-L4_F1,13->FPC1_T      UP
SIB-S4_F2,03->SIB-L4_F1,14 UP      SIB-L4_F1,14->FPC0_B      UP
SIB-S4_F2,07->SIB-L4_F1,15 UP      SIB-L4_F1,15->FPC0_T      UP

```

### show chassis fabric topology (TX Matrix Plus Router)

```
user@host> show chassis fabric topology
```

```
sfc0-re0:
```

```
F13_SIB0
```

```
=====
```

```
Out-Links:
```

```
=====
```

SFC0_F13_SIB_00	-> LCC00_ST_SIB_L00	VCSEL Status	HSL2 Channel	HSL2 Status
=====				
SF_30_00_FB_D(04,11)	-> FPC0_T_SG(0,0,0)_FB_D(01,11)	OK	112	Up
SF_30_00_FB_D(04,10)	-> FPC0_T_SG(0,0,1)_FB_D(01,10)	OK	112	Up
SF_30_00_FB_D(04,09)	-> FPC0_T_SG(0,0,2)_FB_D(01,09)	OK	112	Up
SF_30_00_FB_D(04,08)	-> FPC0_T_SG(0,0,3)_FB_D(01,08)	OK	112	Up
SF_30_00_FB_D(04,07)	-> FPC0_T_SG(0,0,4)_FB_D(01,07)	OK	112	Up
SF_30_00_FB_D(04,06)	-> FPC0_T_SG(0,0,5)_FB_D(01,06)	OK	112	Up
SF_30_00_FB_D(04,05)	-> FPC0_T_SG(0,0,6)_FB_D(01,05)	OK	112	Up
SF_30_00_FB_D(04,04)	-> FPC0_T_SG(0,0,7)_FB_D(01,04)	OK	112	Up
SF_30_01_FB_B(16,11)	-> FPC4_T_SG(2,0,0)_FB_B(13,11)	OK	119	Up
SF_30_01_FB_B(16,10)	-> FPC4_T_SG(2,0,1)_FB_B(13,10)	OK	119	Up
SF_30_01_FB_B(16,09)	-> FPC4_T_SG(2,0,2)_FB_B(13,09)	OK	119	Up
SF_30_01_FB_B(16,08)	-> FPC4_T_SG(2,0,3)_FB_B(13,08)	OK	119	Up
SF_30_01_FB_B(16,07)	-> FPC4_T_SG(2,0,4)_FB_B(13,07)	OK	119	Up
SF_30_01_FB_B(16,06)	-> FPC4_T_SG(2,0,5)_FB_B(13,06)	OK	119	Up
SF_30_01_FB_B(16,05)	-> FPC4_T_SG(2,0,6)_FB_B(13,05)	OK	119	Up
SF_30_01_FB_B(16,04)	-> FPC4_T_SG(2,0,7)_FB_B(13,04)	OK	119	Up
SF_30_02_FB_D(05,08)	-> FPC1_T_SG(0,2,0)_FB_D(02,08)	OK	126	Up
SF_30_02_FB_D(05,07)	-> FPC1_T_SG(0,2,1)_FB_D(02,07)	OK	126	Up
SF_30_02_FB_D(05,06)	-> FPC1_T_SG(0,2,2)_FB_D(02,06)	OK	126	Up
SF_30_02_FB_D(05,05)	-> FPC1_T_SG(0,2,3)_FB_D(02,05)	OK	126	Up
SF_30_02_FB_D(05,03)	-> FPC1_T_SG(0,2,4)_FB_D(02,03)	OK	126	Up
SF_30_02_FB_D(05,02)	-> FPC1_T_SG(0,2,5)_FB_D(02,02)	OK	126	Up
SF_30_02_FB_D(05,01)	-> FPC1_T_SG(0,2,6)_FB_D(02,01)	OK	126	Up
SF_30_02_FB_D(05,00)	-> FPC1_T_SG(0,2,7)_FB_D(02,00)	OK	126	Up
SF_30_03_FB_B(17,08)	-> FPC5_T_SG(2,2,0)_FB_B(14,08)	OK	133	Up
SF_30_03_FB_B(17,07)	-> FPC5_T_SG(2,2,1)_FB_B(14,07)	OK	133	Up
SF_30_03_FB_B(17,06)	-> FPC5_T_SG(2,2,2)_FB_B(14,06)	OK	133	Up

```

SF_30_03_FB_B(17,05) -> FPC5_T_SG(2,2,3)_FB_B(14,05)    OK      133    Up
SF_30_03_FB_B(17,03) -> FPC5_T_SG(2,2,4)_FB_B(14,03)    OK      133    Up
SF_30_03_FB_B(17,02) -> FPC5_T_SG(2,2,5)_FB_B(14,02)    OK      133    Up
SF_30_03_FB_B(17,01) -> FPC5_T_SG(2,2,6)_FB_B(14,01)    OK      133    Up
SF_30_03_FB_B(17,00) -> FPC5_T_SG(2,2,7)_FB_B(14,00)    OK      133    Up
SF_30_04_FB_C(10,11) -> FPC2_T_SG(1,0,0)_FB_C(07,11)    OK      140    Up
SF_30_04_FB_C(10,10) -> FPC2_T_SG(1,0,1)_FB_C(07,10)    OK      140    Up
SF_30_04_FB_C(10,09) -> FPC2_T_SG(1,0,2)_FB_C(07,09)    OK      140    Up
SF_30_04_FB_C(10,08) -> FPC2_T_SG(1,0,3)_FB_C(07,08)    OK      140    Up
SF_30_04_FB_C(10,07) -> FPC2_T_SG(1,0,4)_FB_C(07,07)    OK      140    Up
SF_30_04_FB_C(10,06) -> FPC2_T_SG(1,0,5)_FB_C(07,06)    OK      140    Up
SF_30_04_FB_C(10,05) -> FPC2_T_SG(1,0,6)_FB_C(07,05)    OK      140    Up
SF_30_04_FB_C(10,04) -> FPC2_T_SG(1,0,7)_FB_C(07,04)    OK      140    Up
SF_30_05_FB_A(22,11) -> FPC6_T_SG(3,0,0)_FB_A(19,11)    OK      147    Up
SF_30_05_FB_A(22,10) -> FPC6_T_SG(3,0,1)_FB_A(19,10)    OK      147    Up
SF_30_05_FB_A(22,09) -> FPC6_T_SG(3,0,2)_FB_A(19,09)    OK      147    Up
SF_30_05_FB_A(22,08) -> FPC6_T_SG(3,0,3)_FB_A(19,08)    OK      147    Up
SF_30_05_FB_A(22,07) -> FPC6_T_SG(3,0,4)_FB_A(19,07)    OK      147    Up
SF_30_05_FB_A(22,06) -> FPC6_T_SG(3,0,5)_FB_A(19,06)    OK      147    Up
SF_30_05_FB_A(22,05) -> FPC6_T_SG(3,0,6)_FB_A(19,05)    OK      147    Up
SF_30_05_FB_A(22,04) -> FPC6_T_SG(3,0,7)_FB_A(19,04)    OK      147    Up
SF_30_06_FB_C(11,08) -> FPC3_T_SG(1,2,0)_FB_C(08,08)    OK      154    Up
SF_30_06_FB_C(11,07) -> FPC3_T_SG(1,2,1)_FB_C(08,07)    OK      154    Up
SF_30_06_FB_C(11,06) -> FPC3_T_SG(1,2,2)_FB_C(08,06)    OK      154    Up
SF_30_06_FB_C(11,05) -> FPC3_T_SG(1,2,3)_FB_C(08,05)    OK      154    Up
SF_30_06_FB_C(11,03) -> FPC3_T_SG(1,2,4)_FB_C(08,03)    OK      154    Up
SF_30_06_FB_C(11,02) -> FPC3_T_SG(1,2,5)_FB_C(08,02)    OK      154    Up
SF_30_06_FB_C(11,01) -> FPC3_T_SG(1,2,6)_FB_C(08,01)    OK      154    Up
SF_30_06_FB_C(11,00) -> FPC3_T_SG(1,2,7)_FB_C(08,00)    OK      154    Up
...

```

### show chassis fabric topology sfc (TX Matrix Plus Router)

```
user@host> show chassis fabric topology sfc 0
```

```
sfc0-re0:
```

```
F13_SIB0
```

```
=====
```

```
Out-Links:
```

```
=====
```

SFC0_F13_SIB_00	-> LCC00_ST_SIB_L00	VCSEL Status	HSL2 Channel	HSL2 Status
=====				
SF_30_00_FB_D(04,11)	-> FPC0_T_SG(0,0,0)_FB_D(01,11)	OK	112	Up
SF_30_00_FB_D(04,10)	-> FPC0_T_SG(0,0,1)_FB_D(01,10)	OK	112	Up
SF_30_00_FB_D(04,09)	-> FPC0_T_SG(0,0,2)_FB_D(01,09)	OK	112	Up
SF_30_00_FB_D(04,08)	-> FPC0_T_SG(0,0,3)_FB_D(01,08)	OK	112	Up
SF_30_00_FB_D(04,07)	-> FPC0_T_SG(0,0,4)_FB_D(01,07)	OK	112	Up
SF_30_00_FB_D(04,06)	-> FPC0_T_SG(0,0,5)_FB_D(01,06)	OK	112	Up
SF_30_00_FB_D(04,05)	-> FPC0_T_SG(0,0,6)_FB_D(01,05)	OK	112	Up
SF_30_00_FB_D(04,04)	-> FPC0_T_SG(0,0,7)_FB_D(01,04)	OK	112	Up
SF_30_01_FB_B(16,11)	-> FPC4_T_SG(2,0,0)_FB_B(13,11)	OK	119	Up
SF_30_01_FB_B(16,10)	-> FPC4_T_SG(2,0,1)_FB_B(13,10)	OK	119	Up
SF_30_01_FB_B(16,09)	-> FPC4_T_SG(2,0,2)_FB_B(13,09)	OK	119	Up
SF_30_01_FB_B(16,08)	-> FPC4_T_SG(2,0,3)_FB_B(13,08)	OK	119	Up
SF_30_01_FB_B(16,07)	-> FPC4_T_SG(2,0,4)_FB_B(13,07)	OK	119	Up
SF_30_01_FB_B(16,06)	-> FPC4_T_SG(2,0,5)_FB_B(13,06)	OK	119	Up

```

SF_30_01_FB_B(16,05) -> FPC4_T_SG(2,0,6)_FB_B(13,05)    OK      119    Up
SF_30_01_FB_B(16,04) -> FPC4_T_SG(2,0,7)_FB_B(13,04)    OK      119    Up
SF_30_02_FB_D(05,08) -> FPC1_T_SG(0,2,0)_FB_D(02,08)    OK      126    Up
SF_30_02_FB_D(05,07) -> FPC1_T_SG(0,2,1)_FB_D(02,07)    OK      126    Up
SF_30_02_FB_D(05,06) -> FPC1_T_SG(0,2,2)_FB_D(02,06)    OK      126    Up
SF_30_02_FB_D(05,05) -> FPC1_T_SG(0,2,3)_FB_D(02,05)    OK      126    Up
SF_30_02_FB_D(05,03) -> FPC1_T_SG(0,2,4)_FB_D(02,03)    OK      126    Up
SF_30_02_FB_D(05,02) -> FPC1_T_SG(0,2,5)_FB_D(02,02)    OK      126    Up
SF_30_02_FB_D(05,01) -> FPC1_T_SG(0,2,6)_FB_D(02,01)    OK      126    Up
SF_30_02_FB_D(05,00) -> FPC1_T_SG(0,2,7)_FB_D(02,00)    OK      126    Up
SF_30_03_FB_B(17,08) -> FPC5_T_SG(2,2,0)_FB_B(14,08)    OK      133    Up
SF_30_03_FB_B(17,07) -> FPC5_T_SG(2,2,1)_FB_B(14,07)    OK      133    Up
SF_30_03_FB_B(17,06) -> FPC5_T_SG(2,2,2)_FB_B(14,06)    OK      133    Up
SF_30_03_FB_B(17,05) -> FPC5_T_SG(2,2,3)_FB_B(14,05)    OK      133    Up
SF_30_03_FB_B(17,03) -> FPC5_T_SG(2,2,4)_FB_B(14,03)    OK      133    Up
SF_30_03_FB_B(17,02) -> FPC5_T_SG(2,2,5)_FB_B(14,02)    OK      133    Up
SF_30_03_FB_B(17,01) -> FPC5_T_SG(2,2,6)_FB_B(14,01)    OK      133    Up
SF_30_03_FB_B(17,00) -> FPC5_T_SG(2,2,7)_FB_B(14,00)    OK      133    Up
SF_30_04_FB_C(10,11) -> FPC2_T_SG(1,0,0)_FB_C(07,11)    OK      140    Up
SF_30_04_FB_C(10,10) -> FPC2_T_SG(1,0,1)_FB_C(07,10)    OK      140    Up
SF_30_04_FB_C(10,09) -> FPC2_T_SG(1,0,2)_FB_C(07,09)    OK      140    Up
SF_30_04_FB_C(10,08) -> FPC2_T_SG(1,0,3)_FB_C(07,08)    OK      140    Up
SF_30_04_FB_C(10,07) -> FPC2_T_SG(1,0,4)_FB_C(07,07)    OK      140    Up
SF_30_04_FB_C(10,06) -> FPC2_T_SG(1,0,5)_FB_C(07,06)    OK      140    Up
SF_30_04_FB_C(10,05) -> FPC2_T_SG(1,0,6)_FB_C(07,05)    OK      140    Up
SF_30_04_FB_C(10,04) -> FPC2_T_SG(1,0,7)_FB_C(07,04)    OK      140    Up
SF_30_05_FB_A(22,11) -> FPC6_T_SG(3,0,0)_FB_A(19,11)    OK      147    Up
SF_30_05_FB_A(22,10) -> FPC6_T_SG(3,0,1)_FB_A(19,10)    OK      147    Up
SF_30_05_FB_A(22,09) -> FPC6_T_SG(3,0,2)_FB_A(19,09)    OK      147    Up
SF_30_05_FB_A(22,08) -> FPC6_T_SG(3,0,3)_FB_A(19,08)    OK      147    Up
SF_30_05_FB_A(22,07) -> FPC6_T_SG(3,0,4)_FB_A(19,07)    OK      147    Up
SF_30_05_FB_A(22,06) -> FPC6_T_SG(3,0,5)_FB_A(19,06)    OK      147    Up
SF_30_05_FB_A(22,05) -> FPC6_T_SG(3,0,6)_FB_A(19,05)    OK      147    Up
SF_30_05_FB_A(22,04) -> FPC6_T_SG(3,0,7)_FB_A(19,04)    OK      147    Up
SF_30_06_FB_C(11,08) -> FPC3_T_SG(1,2,0)_FB_C(08,08)    OK      154    Up
SF_30_06_FB_C(11,07) -> FPC3_T_SG(1,2,1)_FB_C(08,07)    OK      154    Up
SF_30_06_FB_C(11,06) -> FPC3_T_SG(1,2,2)_FB_C(08,06)    OK      154    Up
SF_30_06_FB_C(11,05) -> FPC3_T_SG(1,2,3)_FB_C(08,05)    OK      154    Up
SF_30_06_FB_C(11,03) -> FPC3_T_SG(1,2,4)_FB_C(08,03)    OK      154    Up
SF_30_06_FB_C(11,02) -> FPC3_T_SG(1,2,5)_FB_C(08,02)    OK      154    Up
SF_30_06_FB_C(11,01) -> FPC3_T_SG(1,2,6)_FB_C(08,01)    OK      154    Up
SF_30_06_FB_C(11,00) -> FPC3_T_SG(1,2,7)_FB_C(08,00)    OK      154    Up
...

```

### show chassis fabric topology lcc (TX Matrix Plus Router)

```
user@host> show chassis fabric topology lcc 0
```

```
lcc0-re0:
```

```
SIB0
```

```
=====
```

```
Out-Links:
```

```
=====
```

LCC00_ST_SIB_L00	-> SFC0_F13_SIB_00	VCSEL Status	HSL2 Channel	HSL2 Status
=====				
FPC0_T_SG(0,0,0)_FB_D(04,11)	-> SF_10_00_FB_D(01,11)	OK	12	Up

```

FPC0_T_SG(0,0,1)_FB_D(04,10) -> SF_10_00_FB_D(01,10)    OK    12    Up
FPC0_T_SG(0,0,2)_FB_D(04,09) -> SF_10_00_FB_D(01,09)    OK    12    Up
FPC0_T_SG(0,0,3)_FB_D(04,08) -> SF_10_00_FB_D(01,08)    OK    12    Up
FPC0_T_SG(0,0,4)_FB_D(04,07) -> SF_10_00_FB_D(01,07)    OK    12    Up
FPC0_T_SG(0,0,5)_FB_D(04,06) -> SF_10_00_FB_D(01,06)    OK    12    Up
FPC0_T_SG(0,0,6)_FB_D(04,05) -> SF_10_00_FB_D(01,05)    OK    12    Up
FPC0_T_SG(0,0,7)_FB_D(04,04) -> SF_10_00_FB_D(01,04)    OK    12    Up
FPC0_B_SG(0,1,0)_FB_D(03,07) -> SF_10_10_FB_D(00,07)    OK    15    Up
FPC0_B_SG(0,1,1)_FB_D(03,06) -> SF_10_10_FB_D(00,06)    OK    15    Up
FPC0_B_SG(0,1,2)_FB_D(03,05) -> SF_10_10_FB_D(00,05)    OK    15    Up
FPC0_B_SG(0,1,3)_FB_D(03,04) -> SF_10_10_FB_D(00,04)    OK    15    Up
FPC0_B_SG(0,1,4)_FB_D(03,03) -> SF_10_10_FB_D(00,03)    OK    15    Up
FPC0_B_SG(0,1,5)_FB_D(03,02) -> SF_10_10_FB_D(00,02)    OK    15    Up
FPC0_B_SG(0,1,6)_FB_D(03,01) -> SF_10_10_FB_D(00,01)    OK    15    Up
FPC0_B_SG(0,1,7)_FB_D(03,00) -> SF_10_10_FB_D(00,00)    OK    15    Up
FPC1_T_SG(0,2,0)_FB_D(05,08) -> SF_10_02_FB_D(02,08)    OK    18    Up
FPC1_T_SG(0,2,1)_FB_D(05,07) -> SF_10_02_FB_D(02,07)    OK    18    Up
FPC1_T_SG(0,2,2)_FB_D(05,06) -> SF_10_02_FB_D(02,06)    OK    18    Up
FPC1_T_SG(0,2,3)_FB_D(05,05) -> SF_10_02_FB_D(02,05)    OK    18    Up
FPC1_T_SG(0,2,4)_FB_D(05,03) -> SF_10_02_FB_D(02,03)    OK    18    Up
FPC1_T_SG(0,2,5)_FB_D(05,02) -> SF_10_02_FB_D(02,02)    OK    18    Up
FPC1_T_SG(0,2,6)_FB_D(05,01) -> SF_10_02_FB_D(02,01)    OK    18    Up
FPC1_T_SG(0,2,7)_FB_D(05,00) -> SF_10_02_FB_D(02,00)    OK    18    Up
FPC1_B_SG(0,3,0)_FB_D(04,03) -> SF_10_11_FB_D(01,03)    OK    21    Up
FPC1_B_SG(0,3,1)_FB_D(04,02) -> SF_10_11_FB_D(01,02)    OK    21    Up
FPC1_B_SG(0,3,2)_FB_D(04,01) -> SF_10_11_FB_D(01,01)    OK    21    Up
FPC1_B_SG(0,3,3)_FB_D(04,00) -> SF_10_11_FB_D(01,00)    OK    21    Up
FPC1_B_SG(0,3,4)_FB_D(03,11) -> SF_10_11_FB_D(00,11)    OK    21    Up
FPC1_B_SG(0,3,5)_FB_D(03,10) -> SF_10_11_FB_D(00,10)    OK    21    Up
FPC1_B_SG(0,3,6)_FB_D(03,09) -> SF_10_11_FB_D(00,09)    OK    21    Up
FPC1_B_SG(0,3,7)_FB_D(03,08) -> SF_10_11_FB_D(00,08)    OK    21    Up
FPC2_T_SG(1,0,0)_FB_C(10,11) -> SF_10_04_FB_C(07,11)    OK    12    Up
FPC2_T_SG(1,0,1)_FB_C(10,10) -> SF_10_04_FB_C(07,10)    OK    12    Up
FPC2_T_SG(1,0,2)_FB_C(10,09) -> SF_10_04_FB_C(07,09)    OK    12    Up
FPC2_T_SG(1,0,3)_FB_C(10,08) -> SF_10_04_FB_C(07,08)    OK    12    Up
FPC2_T_SG(1,0,4)_FB_C(10,07) -> SF_10_04_FB_C(07,07)    OK    12    Up
FPC2_T_SG(1,0,5)_FB_C(10,06) -> SF_10_04_FB_C(07,06)    OK    12    Up
FPC2_T_SG(1,0,6)_FB_C(10,05) -> SF_10_04_FB_C(07,05)    OK    12    Up
FPC2_T_SG(1,0,7)_FB_C(10,04) -> SF_10_04_FB_C(07,04)    OK    12    Up
FPC2_B_SG(1,1,0)_FB_C(09,07) -> SF_10_14_FB_C(06,07)    OK    15    Up
FPC2_B_SG(1,1,1)_FB_C(09,06) -> SF_10_14_FB_C(06,06)    OK    15    Up
FPC2_B_SG(1,1,2)_FB_C(09,05) -> SF_10_14_FB_C(06,05)    OK    15    Up
FPC2_B_SG(1,1,3)_FB_C(09,04) -> SF_10_14_FB_C(06,04)    OK    15    Up
FPC2_B_SG(1,1,4)_FB_C(09,03) -> SF_10_14_FB_C(06,03)    OK    15    Up
FPC2_B_SG(1,1,5)_FB_C(09,02) -> SF_10_14_FB_C(06,02)    OK    15    Up
FPC2_B_SG(1,1,6)_FB_C(09,01) -> SF_10_14_FB_C(06,01)    OK    15    Up
FPC2_B_SG(1,1,7)_FB_C(09,00) -> SF_10_14_FB_C(06,00)    OK    15    Up
FPC3_T_SG(1,2,0)_FB_C(11,08) -> SF_10_06_FB_C(08,08)    OK    18    Up
FPC3_T_SG(1,2,1)_FB_C(11,07) -> SF_10_06_FB_C(08,07)    OK    18    Up
FPC3_T_SG(1,2,2)_FB_C(11,06) -> SF_10_06_FB_C(08,06)    OK    18    Up
FPC3_T_SG(1,2,3)_FB_C(11,05) -> SF_10_06_FB_C(08,05)    OK    18    Up
FPC3_T_SG(1,2,4)_FB_C(11,03) -> SF_10_06_FB_C(08,03)    OK    18    Up
FPC3_T_SG(1,2,5)_FB_C(11,02) -> SF_10_06_FB_C(08,02)    OK    18    Up
FPC3_T_SG(1,2,6)_FB_C(11,01) -> SF_10_06_FB_C(08,01)    OK    18    Up
...

```

### show chassis fabric topology (T4000 Core Router)

```
user@host> show chassis fabric topology 0
```



fchip (mode)				
In-links	State	Out-links	State	
-----				
SIB0 :				
-----				
Onboard Links				
-----				
SIB0_XF1,14_0->SIB0_XF,00_0	Up	SIB0_XF,00_0->SIB0_XF1,14_0	Up	
SIB0_XF,00_0->SIB0_XF1,14_0	Up	SIB0_XF1,14_0->SIB0_XF,00_0	Up	
SIB0_XF1,13_0->SIB0_XF,01_0	Up	SIB0_XF,01_0->SIB0_XF1,13_0	Up	
SIB0_XF,01_0->SIB0_XF1,13_0	Up	SIB0_XF1,13_0->SIB0_XF,01_0	Up	
SIB0_XF1,12_0->SIB0_XF,02_0	Up	SIB0_XF,02_0->SIB0_XF1,12_0	Up	
SIB0_XF,02_0->SIB0_XF1,12_0	Up	SIB0_XF1,12_0->SIB0_XF,02_0	Up	
SIB0_XF1,11_0->SIB0_XF,03_0	Up	SIB0_XF,03_0->SIB0_XF1,11_0	Up	
SIB0_XF,03_0->SIB0_XF1,11_0	Up	SIB0_XF1,11_0->SIB0_XF,03_0	Up	
SIB0_XF1,10_0->SIB0_XF,04_0	Up	SIB0_XF,04_0->SIB0_XF1,10_0	Up	
SIB0_XF,04_0->SIB0_XF1,10_0	Up	SIB0_XF1,10_0->SIB0_XF,04_0	Up	
SIB0_XF1,09_0->SIB0_XF,05_0	Up	SIB0_XF,05_0->SIB0_XF1,09_0	Up	
SIB0_XF,05_0->SIB0_XF1,09_0	Up	SIB0_XF1,09_0->SIB0_XF,05_0	Up	
SIB0_XF2,14_0->SIB0_XF,06_0	Up	SIB0_XF,06_0->SIB0_XF2,14_0	Up	
SIB0_XF,06_0->SIB0_XF2,14_0	Up	SIB0_XF2,14_0->SIB0_XF,06_0	Up	
SIB0_XF2,13_0->SIB0_XF,07_0	Up	SIB0_XF,07_0->SIB0_XF2,13_0	Up	
SIB0_XF,07_0->SIB0_XF2,13_0	Up	SIB0_XF2,13_0->SIB0_XF,07_0	Up	
SIB0_XF2,12_0->SIB0_XF,08_0	Up	SIB0_XF,08_0->SIB0_XF2,12_0	Up	
SIB0_XF,08_0->SIB0_XF2,12_0	Up	SIB0_XF2,12_0->SIB0_XF,08_0	Up	
SIB0_XF2,11_0->SIB0_XF,09_0	Up	SIB0_XF,09_0->SIB0_XF2,11_0	Up	
SIB0_XF,09_0->SIB0_XF2,11_0	Up	SIB0_XF2,11_0->SIB0_XF,09_0	Up	
SIB0_XF2,10_0->SIB0_XF,10_0	Up	SIB0_XF,10_0->SIB0_XF2,10_0	Up	
SIB0_XF,10_0->SIB0_XF2,10_0	Up	SIB0_XF2,10_0->SIB0_XF,10_0	Up	
SIB0_XF2,09_0->SIB0_XF,11_0	Up	SIB0_XF,11_0->SIB0_XF2,09_0	Up	
SIB0_XF,11_0->SIB0_XF2,09_0	Up	SIB0_XF2,09_0->SIB0_XF,11_0	Up	
SIB0_XF3,13_0->SIB0_XF,12_0	Up	SIB0_XF,12_0->SIB0_XF3,13_0	Up	
SIB0_XF,12_0->SIB0_XF3,13_0	Up	SIB0_XF3,13_0->SIB0_XF,12_0	Up	
SIB0_XF3,12_0->SIB0_XF,13_0	Up	SIB0_XF,13_0->SIB0_XF3,12_0	Up	
SIB0_XF,13_0->SIB0_XF3,12_0	Up	SIB0_XF3,12_0->SIB0_XF,13_0	Up	
SIB0_XF3,11_0->SIB0_XF,14_0	Up	SIB0_XF,14_0->SIB0_XF3,11_0	Up	
SIB0_XF,14_0->SIB0_XF3,11_0	Up	SIB0_XF3,11_0->SIB0_XF,14_0	Up	
SIB0_XF3,10_0->SIB0_XF,15_0	Up	SIB0_XF,15_0->SIB0_XF3,10_0	Up	
SIB0_XF,15_0->SIB0_XF3,10_0	Up	SIB0_XF3,10_0->SIB0_XF,15_0	Up	
PFE Links				
-----				
FPC2PFE0->SIB0_XF1,05_0	Up	SIB0_XF1,05_0->FPC2PFE0	Up	
FPC3PFE0->SIB0_XF2,15_0	Up	SIB0_XF2,15_0->FPC3PFE0	Up	
FPC5PFE0->SIB0_XF2,05_0	Up	SIB0_XF2,05_0->FPC5PFE0	Up	
FPC5PFE1->SIB0_XF2,07_0	Up	SIB0_XF2,07_0->FPC5PFE1	Up	
FPC6PFE0->SIB0_XF3,01_0	Up	SIB0_XF3,01_0->FPC6PFE0	Up	
FPC6PFE0->SIB0_XF3,01_1	Up	SIB0_XF3,01_1->FPC6PFE0	Up	
FPC6PFE0->SIB0_XF3,02_0	Up	SIB0_XF3,02_0->FPC6PFE0	Up	
FPC6PFE1->SIB0_XF3,03_0	Up	SIB0_XF3,03_0->FPC6PFE1	Up	
FPC6PFE1->SIB0_XF3,03_1	Up	SIB0_XF3,03_1->FPC6PFE1	Up	
FPC6PFE1->SIB0_XF3,02_1	Up	SIB0_XF3,02_1->FPC6PFE1	Up	

show chassis fabric topology lcc (TX Matrix Plus Router with 3D SIBs)

user@host> show chassis fabric topology lcc 6

## lcc6-re0:

fchip (mode)	In-links	State	Out-links	State
SIB0 :				
-----				
CXP0_Evn->	LCC_SIB0_XF3,10_0	Up	LCC_SIB0_XF3,10_0->CXP0_Evn	Up
CXP0_Odd->	LCC_SIB0_XF3,11_0	Up	LCC_SIB0_XF3,11_0->CXP0_Odd	Up
CXP1_Evn->	LCC_SIB0_XF3,12_0	Up	LCC_SIB0_XF3,12_0->CXP1_Evn	Up
CXP1_Odd->	LCC_SIB0_XF3,13_0	Up	LCC_SIB0_XF3,13_0->CXP1_Odd	Up
CXP2_Evn->	LCC_SIB0_XF2,09_0	Up	LCC_SIB0_XF2,09_0->CXP2_Evn	Up
CXP2_Odd->	LCC_SIB0_XF2,10_0	Up	LCC_SIB0_XF2,10_0->CXP2_Odd	Up
CXP3_Evn->	LCC_SIB0_XF2,11_0	Up	LCC_SIB0_XF2,11_0->CXP3_Evn	Up
CXP3_Odd->	LCC_SIB0_XF2,12_0	Up	LCC_SIB0_XF2,12_0->CXP3_Odd	Up
CXP4_Evn->	LCC_SIB0_XF2,13_0	Up	LCC_SIB0_XF2,13_0->CXP4_Evn	Up
CXP4_Odd->	LCC_SIB0_XF1,09_0	Up	LCC_SIB0_XF1,09_0->CXP4_Odd	Up
CXP5_Evn->	LCC_SIB0_XF2,14_0	Up	LCC_SIB0_XF2,14_0->CXP5_Evn	Up
CXP5_Odd->	LCC_SIB0_XF1,10_0	Up	LCC_SIB0_XF1,10_0->CXP5_Odd	Up
CXP6_Evn->	LCC_SIB0_XF1,11_0	Up	LCC_SIB0_XF1,11_0->CXP6_Evn	Up
CXP6_Odd->	LCC_SIB0_XF1,12_0	Up	LCC_SIB0_XF1,12_0->CXP6_Odd	Up
CXP7_Evn->	LCC_SIB0_XF1,13_0	Up	LCC_SIB0_XF1,13_0->CXP7_Evn	Up
CXP7_Odd->	LCC_SIB0_XF1,14_0	Up	LCC_SIB0_XF1,14_0->CXP7_Odd	Up
SIB1 :				
-----				
SIB2 :				
-----				
CXP0_Evn->	LCC_SIB2_XF3,10_0	Up	LCC_SIB2_XF3,10_0->CXP0_Evn	Up
CXP0_Odd->	LCC_SIB2_XF3,11_0	Up	LCC_SIB2_XF3,11_0->CXP0_Odd	Up
CXP1_Evn->	LCC_SIB2_XF3,12_0	Up	LCC_SIB2_XF3,12_0->CXP1_Evn	Up
CXP1_Odd->	LCC_SIB2_XF3,13_0	Up	LCC_SIB2_XF3,13_0->CXP1_Odd	Up
CXP2_Evn->	LCC_SIB2_XF2,09_0	Up	LCC_SIB2_XF2,09_0->CXP2_Evn	Up
CXP2_Odd->	LCC_SIB2_XF2,10_0	Up	LCC_SIB2_XF2,10_0->CXP2_Odd	Up
CXP3_Evn->	LCC_SIB2_XF2,11_0	Up	LCC_SIB2_XF2,11_0->CXP3_Evn	Up
CXP3_Odd->	LCC_SIB2_XF2,12_0	Up	LCC_SIB2_XF2,12_0->CXP3_Odd	Up
CXP4_Evn->	LCC_SIB2_XF2,13_0	Up	LCC_SIB2_XF2,13_0->CXP4_Evn	Up
CXP4_Odd->	LCC_SIB2_XF1,09_0	Up	LCC_SIB2_XF1,09_0->CXP4_Odd	Up
CXP5_Evn->	LCC_SIB2_XF2,14_0	Up	LCC_SIB2_XF2,14_0->CXP5_Evn	Up
CXP5_Odd->	LCC_SIB2_XF1,10_0	Up	LCC_SIB2_XF1,10_0->CXP5_Odd	Up
CXP6_Evn->	LCC_SIB2_XF1,11_0	Up	LCC_SIB2_XF1,11_0->CXP6_Evn	Up
CXP6_Odd->	LCC_SIB2_XF1,12_0	Up	LCC_SIB2_XF1,12_0->CXP6_Odd	Up
CXP7_Evn->	LCC_SIB2_XF1,13_0	Up	LCC_SIB2_XF1,13_0->CXP7_Evn	Up
CXP7_Odd->	LCC_SIB2_XF1,14_0	Up	LCC_SIB2_XF1,14_0->CXP7_Odd	Up
SIB3 :				
-----				
CXP0_Evn->	LCC_SIB3_XF3,10_0	Up	LCC_SIB3_XF3,10_0->CXP0_Evn	Up
CXP0_Odd->	LCC_SIB3_XF3,11_0	Up	LCC_SIB3_XF3,11_0->CXP0_Odd	Up
CXP1_Evn->	LCC_SIB3_XF3,12_0	Up	LCC_SIB3_XF3,12_0->CXP1_Evn	Up
CXP1_Odd->	LCC_SIB3_XF3,13_0	Up	LCC_SIB3_XF3,13_0->CXP1_Odd	Up
CXP2_Evn->	LCC_SIB3_XF2,09_0	Up	LCC_SIB3_XF2,09_0->CXP2_Evn	Up
CXP2_Odd->	LCC_SIB3_XF2,10_0	Up	LCC_SIB3_XF2,10_0->CXP2_Odd	Up
CXP3_Evn->	LCC_SIB3_XF2,11_0	Up	LCC_SIB3_XF2,11_0->CXP3_Evn	Up
CXP3_Odd->	LCC_SIB3_XF2,12_0	Up	LCC_SIB3_XF2,12_0->CXP3_Odd	Up
CXP4_Evn->	LCC_SIB3_XF2,13_0	Up	LCC_SIB3_XF2,13_0->CXP4_Evn	Up
CXP4_Odd->	LCC_SIB3_XF1,09_0	Up	LCC_SIB3_XF1,09_0->CXP4_Odd	Up
CXP5_Evn->	LCC_SIB3_XF2,14_0	Up	LCC_SIB3_XF2,14_0->CXP5_Evn	Up
CXP5_Odd->	LCC_SIB3_XF1,10_0	Up	LCC_SIB3_XF1,10_0->CXP5_Odd	Up
CXP6_Evn->	LCC_SIB3_XF1,11_0	Up	LCC_SIB3_XF1,11_0->CXP6_Evn	Up
CXP6_Odd->	LCC_SIB3_XF1,12_0	Up	LCC_SIB3_XF1,12_0->CXP6_Odd	Up
CXP7_Evn->	LCC_SIB3_XF1,13_0	Up	LCC_SIB3_XF1,13_0->CXP7_Evn	Up

```

CXP7_Odd->LCC_SIB3_XF1,14_0    Up    LCC_SIB3_XF1,14_0->CXP7_Odd    Up
SIB4 :
-----
CXP0_Evn->LCC_SIB4_XF3,10_0    Up    LCC_SIB4_XF3,10_0->CXP0_Evn    Up
CXP0_Odd->LCC_SIB4_XF3,11_0    Up    LCC_SIB4_XF3,11_0->CXP0_Odd    Up
CXP1_Evn->LCC_SIB4_XF3,12_0    Up    LCC_SIB4_XF3,12_0->CXP1_Evn    Up
CXP1_Odd->LCC_SIB4_XF3,13_0    Up    LCC_SIB4_XF3,13_0->CXP1_Odd    Up
CXP2_Evn->LCC_SIB4_XF2,09_0    Up    LCC_SIB4_XF2,09_0->CXP2_Evn    Up
CXP2_Odd->LCC_SIB4_XF2,10_0    Up    LCC_SIB4_XF2,10_0->CXP2_Odd    Up
CXP3_Evn->LCC_SIB4_XF2,11_0    Up    LCC_SIB4_XF2,11_0->CXP3_Evn    Up
CXP3_Odd->LCC_SIB4_XF2,12_0    Up    LCC_SIB4_XF2,12_0->CXP3_Odd    Up
CXP4_Evn->LCC_SIB4_XF2,13_0    Up    LCC_SIB4_XF2,13_0->CXP4_Evn    Up
CXP4_Odd->LCC_SIB4_XF1,09_0    Up    LCC_SIB4_XF1,09_0->CXP4_Odd    Up
CXP5_Evn->LCC_SIB4_XF2,14_0    Up    LCC_SIB4_XF2,14_0->CXP5_Evn    Up
CXP5_Odd->LCC_SIB4_XF1,10_0    Up    LCC_SIB4_XF1,10_0->CXP5_Odd    Up
CXP6_Evn->LCC_SIB4_XF1,11_0    Up    LCC_SIB4_XF1,11_0->CXP6_Evn    Up
CXP6_Odd->LCC_SIB4_XF1,12_0    Up    LCC_SIB4_XF1,12_0->CXP6_Odd    Up
CXP7_Evn->LCC_SIB4_XF1,13_0    Up    LCC_SIB4_XF1,13_0->CXP7_Evn    Up
CXP7_Odd->LCC_SIB4_XF1,14_0    Up    LCC_SIB4_XF1,14_0->CXP7_Odd    Up

```

### show chassis fabric topology sfc (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fabric topology sfc 0
```

```
sfc0-re0:
```

```

-----
fchip (mode)
In-links          State          Out-links          State
-----
F13_SIB0 :
-----
CXP0_Evn->F13_SIB0_XF2,04_0    Up    F13_SIB0_XF2,04_0->CXP0_Evn    Up
CXP0_Odd->F13_SIB0_XF2,03_0    Up    F13_SIB0_XF2,03_0->CXP0_Odd    Up
CXP1_Evn->F13_SIB0_XF2,06_0    Up    F13_SIB0_XF2,06_0->CXP1_Evn    Up
CXP1_Odd->F13_SIB0_XF2,05_0    Up    F13_SIB0_XF2,05_0->CXP1_Odd    Up
CXP2_Evn->F13_SIB0_XF2,08_0    Up    F13_SIB0_XF2,08_0->CXP2_Evn    Up
CXP2_Odd->F13_SIB0_XF2,07_0    Up    F13_SIB0_XF2,07_0->CXP2_Odd    Up
CXP3_Evn->F13_SIB0_XF2,10_0    Up    F13_SIB0_XF2,10_0->CXP3_Evn    Up
CXP3_Odd->F13_SIB0_XF2,09_0    Up    F13_SIB0_XF2,09_0->CXP3_Odd    Up
CXP4_Evn->F13_SIB0_XF0,04_0    Up    F13_SIB0_XF0,04_0->CXP4_Evn    Up
CXP4_Odd->F13_SIB0_XF0,03_0    Up    F13_SIB0_XF0,03_0->CXP4_Odd    Up
CXP5_Evn->F13_SIB0_XF0,06_0    Up    F13_SIB0_XF0,06_0->CXP5_Evn    Up
CXP5_Odd->F13_SIB0_XF0,05_0    Up    F13_SIB0_XF0,05_0->CXP5_Odd    Up
CXP6_Evn->F13_SIB0_XF0,08_0    Up    F13_SIB0_XF0,08_0->CXP6_Evn    Up
CXP6_Odd->F13_SIB0_XF0,07_0    Up    F13_SIB0_XF0,07_0->CXP6_Odd    Up
CXP7_Evn->F13_SIB0_XF0,10_0    Up    F13_SIB0_XF0,10_0->CXP7_Evn    Up
CXP7_Odd->F13_SIB0_XF0,09_0    Up    F13_SIB0_XF0,09_0->CXP7_Odd    Up
CXP8_Evn->F13_SIB0_XF3,04_0    Up    F13_SIB0_XF3,04_0->CXP8_Evn    Up
CXP8_Odd->F13_SIB0_XF3,03_0    Up    F13_SIB0_XF3,03_0->CXP8_Odd    Up
CXP9_Evn->F13_SIB0_XF3,06_0    Up    F13_SIB0_XF3,06_0->CXP9_Evn    Up
CXP9_Odd->F13_SIB0_XF3,05_0    Up    F13_SIB0_XF3,05_0->CXP9_Odd    Up
CXP10_Evn->F13_SIB0_XF3,08_0    Up    F13_SIB0_XF3,08_0->CXP10_Evn    Up
CXP10_Odd->F13_SIB0_XF3,07_0    Up    F13_SIB0_XF3,07_0->CXP10_Odd    Up
CXP11_Evn->F13_SIB0_XF3,10_0    Up    F13_SIB0_XF3,10_0->CXP11_Evn    Up
CXP11_Odd->F13_SIB0_XF3,09_0    Up    F13_SIB0_XF3,09_0->CXP11_Odd    Up
CXP12_Evn->F13_SIB0_XF1,04_0    Up    F13_SIB0_XF1,04_0->CXP12_Evn    Up
CXP12_Odd->F13_SIB0_XF1,03_0    Up    F13_SIB0_XF1,03_0->CXP12_Odd    Up
CXP13_Evn->F13_SIB0_XF1,06_0    Up    F13_SIB0_XF1,06_0->CXP13_Evn    Up
CXP13_Odd->F13_SIB0_XF1,05_0    Up    F13_SIB0_XF1,05_0->CXP13_Odd    Up
CXP14_Evn->F13_SIB0_XF1,08_0    Up    F13_SIB0_XF1,08_0->CXP14_Evn    Up

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CXP14_Odd->F13_SIB0_XF1,07_0	Up	F13_SIB0_XF1,07_0->CXP14_Odd	Up
CXP15_Evn->F13_SIB0_XF1,10_0	Up	F13_SIB0_XF1,10_0->CXP15_Evn	Up
CXP15_Odd->F13_SIB0_XF1,09_0	Up	F13_SIB0_XF1,09_0->CXP15_Odd	Up
F13_SIB0_XF4,00_0->F13_SIB0_XF2,02_0	Up	F13_SIB0_XF2,02_0->F13_SIB0_XF4,00_0	Up
F13_SIB0_XF4,01_0->F13_SIB0_XF2,01_0	Up	F13_SIB0_XF2,01_0->F13_SIB0_XF4,01_0	Up
F13_SIB0_XF4,02_0->F13_SIB0_XF2,00_0	Up	F13_SIB0_XF2,00_0->F13_SIB0_XF4,02_0	Up
F13_SIB0_XF4,03_0->F13_SIB0_XF2,15_0	Up	F13_SIB0_XF2,15_0->F13_SIB0_XF4,03_0	Up
F13_SIB0_XF4,04_0->F13_SIB0_XF2,14_0	Up	F13_SIB0_XF2,14_0->F13_SIB0_XF4,04_0	Up
F13_SIB0_XF4,05_0->F13_SIB0_XF2,13_0	Up	F13_SIB0_XF2,13_0->F13_SIB0_XF4,05_0	Up
F13_SIB0_XF4,06_0->F13_SIB0_XF2,12_0	Up	F13_SIB0_XF2,12_0->F13_SIB0_XF4,06_0	Up
F13_SIB0_XF4,07_0->F13_SIB0_XF2,11_0	Up	F13_SIB0_XF2,11_0->F13_SIB0_XF4,07_0	Up
F13_SIB0_XF4,08_0->F13_SIB0_XF0,02_0	Up	F13_SIB0_XF0,02_0->F13_SIB0_XF4,08_0	Up
F13_SIB0_XF4,09_0->F13_SIB0_XF0,01_0	Up	F13_SIB0_XF0,01_0->F13_SIB0_XF4,09_0	Up
F13_SIB0_XF4,10_0->F13_SIB0_XF0,00_0	Up	F13_SIB0_XF0,00_0->F13_SIB0_XF4,10_0	Up
F13_SIB0_XF4,11_0->F13_SIB0_XF0,15_0	Up	F13_SIB0_XF0,15_0->F13_SIB0_XF4,11_0	Up
F13_SIB0_XF4,12_0->F13_SIB0_XF0,14_0	Up	F13_SIB0_XF0,14_0->F13_SIB0_XF4,12_0	Up
F13_SIB0_XF4,13_0->F13_SIB0_XF0,13_0	Up	F13_SIB0_XF0,13_0->F13_SIB0_XF4,13_0	Up
F13_SIB0_XF4,14_0->F13_SIB0_XF0,12_0	Up	F13_SIB0_XF0,12_0->F13_SIB0_XF4,14_0	Up
F13_SIB0_XF4,15_0->F13_SIB0_XF0,11_0	Up	F13_SIB0_XF0,11_0->F13_SIB0_XF4,15_0	Up
F13_SIB0_XF6,08_0->F13_SIB0_XF3,02_0	Up	F13_SIB0_XF3,02_0->F13_SIB0_XF6,08_0	Up
F13_SIB0_XF6,09_0->F13_SIB0_XF3,01_0	Up	F13_SIB0_XF3,01_0->F13_SIB0_XF6,09_0	Up
F13_SIB0_XF6,10_0->F13_SIB0_XF3,00_0	Up	F13_SIB0_XF3,00_0->F13_SIB0_XF6,10_0	Up
F13_SIB0_XF6,11_0->F13_SIB0_XF3,15_0	Up	F13_SIB0_XF3,15_0->F13_SIB0_XF6,11_0	Up
F13_SIB0_XF6,12_0->F13_SIB0_XF3,14_0	Up	F13_SIB0_XF3,14_0->F13_SIB0_XF6,12_0	Up
F13_SIB0_XF6,13_0->F13_SIB0_XF3,13_0	Up	F13_SIB0_XF3,13_0->F13_SIB0_XF6,13_0	Up
F13_SIB0_XF6,14_0->F13_SIB0_XF3,12_0	Up	F13_SIB0_XF3,12_0->F13_SIB0_XF6,14_0	Up
F13_SIB0_XF6,15_0->F13_SIB0_XF3,11_0	Up	F13_SIB0_XF3,11_0->F13_SIB0_XF6,15_0	Up
F13_SIB0_XF6,00_0->F13_SIB0_XF1,02_0	Up	F13_SIB0_XF1,02_0->F13_SIB0_XF6,00_0	Up
F13_SIB0_XF6,01_0->F13_SIB0_XF1,01_0	Up	F13_SIB0_XF1,01_0->F13_SIB0_XF6,01_0	Up
F13_SIB0_XF6,02_0->F13_SIB0_XF1,00_0	Up	F13_SIB0_XF1,00_0->F13_SIB0_XF6,02_0	Up
F13_SIB0_XF6,03_0->F13_SIB0_XF1,15_0	Up	F13_SIB0_XF1,15_0->F13_SIB0_XF6,03_0	Up
F13_SIB0_XF6,04_0->F13_SIB0_XF1,14_0	Up	F13_SIB0_XF1,14_0->F13_SIB0_XF6,04_0	Up

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F13_SIB0_XF6,05_0->F13_SIB0_XF1,13_0 Up  F13_SIB0_XF1,13_0->F13_SIB0_XF6,05_0 Up
F13_SIB0_XF6,06_0->F13_SIB0_XF1,12_0 Up  F13_SIB0_XF1,12_0->F13_SIB0_XF6,06_0 Up
F13_SIB0_XF6,07_0->F13_SIB0_XF1,11_0 Up  F13_SIB0_XF1,11_0->F13_SIB0_XF6,07_0 Up
F13_SIB0_XF2,02_0->F13_SIB0_XF5,00_0 Up  F13_SIB0_XF5,00_0->F13_SIB0_XF2,02_0 Up
F13_SIB0_XF2,01_0->F13_SIB0_XF5,01_0 Up  F13_SIB0_XF5,01_0->F13_SIB0_XF2,01_0 Up
F13_SIB0_XF2,00_0->F13_SIB0_XF5,02_0 Up  F13_SIB0_XF5,02_0->F13_SIB0_XF2,00_0 Up
F13_SIB0_XF2,15_0->F13_SIB0_XF5,03_0 Up  F13_SIB0_XF5,03_0->F13_SIB0_XF2,15_0 Up
F13_SIB0_XF2,14_0->F13_SIB0_XF5,04_0 Up  F13_SIB0_XF5,04_0->F13_SIB0_XF2,14_0 Up
F13_SIB0_XF2,13_0->F13_SIB0_XF5,05_0 Up  F13_SIB0_XF5,05_0->F13_SIB0_XF2,13_0 Up
F13_SIB0_XF2,12_0->F13_SIB0_XF5,06_0 Up  F13_SIB0_XF5,06_0->F13_SIB0_XF2,12_0 Up
F13_SIB0_XF2,11_0->F13_SIB0_XF5,07_0 Up  F13_SIB0_XF5,07_0->F13_SIB0_XF2,11_0 Up
F13_SIB0_XF0,02_0->F13_SIB0_XF5,08_0 Up  F13_SIB0_XF5,08_0->F13_SIB0_XF0,02_0 Up
F13_SIB0_XF0,01_0->F13_SIB0_XF5,09_0 Up  F13_SIB0_XF5,09_0->F13_SIB0_XF0,01_0 Up
F13_SIB0_XF0,00_0->F13_SIB0_XF5,10_0 Up  F13_SIB0_XF5,10_0->F13_SIB0_XF0,00_0 Up
F13_SIB0_XF0,15_0->F13_SIB0_XF5,11_0 Up  F13_SIB0_XF5,11_0->F13_SIB0_XF0,15_0 Up
F13_SIB0_XF0,14_0->F13_SIB0_XF5,12_0 Up  F13_SIB0_XF5,12_0->F13_SIB0_XF0,14_0 Up
F13_SIB0_XF0,13_0->F13_SIB0_XF5,13_0 Up  F13_SIB0_XF5,13_0->F13_SIB0_XF0,13_0 Up
F13_SIB0_XF0,12_0->F13_SIB0_XF5,14_0 Up  F13_SIB0_XF5,14_0->F13_SIB0_XF0,12_0 Up
F13_SIB0_XF0,11_0->F13_SIB0_XF5,15_0 Up  F13_SIB0_XF5,15_0->F13_SIB0_XF0,11_0 Up
F13_SIB0_XF3,02_0->F13_SIB0_XF7,08_0 Up  F13_SIB0_XF7,08_0->F13_SIB0_XF3,02_0 Up
F13_SIB0_XF3,01_0->F13_SIB0_XF7,09_0 Up  F13_SIB0_XF7,09_0->F13_SIB0_XF3,01_0 Up
F13_SIB0_XF3,00_0->F13_SIB0_XF7,10_0 Up  F13_SIB0_XF7,10_0->F13_SIB0_XF3,00_0 Up
F13_SIB0_XF3,15_0->F13_SIB0_XF7,11_0 Up  F13_SIB0_XF7,11_0->F13_SIB0_XF3,15_0 Up
F13_SIB0_XF3,14_0->F13_SIB0_XF7,12_0 Up  F13_SIB0_XF7,12_0->F13_SIB0_XF3,14_0 Up
F13_SIB0_XF3,13_0->F13_SIB0_XF7,13_0 Up  F13_SIB0_XF7,13_0->F13_SIB0_XF3,13_0 Up
F13_SIB0_XF3,12_0->F13_SIB0_XF7,14_0 Up  F13_SIB0_XF7,14_0->F13_SIB0_XF3,12_0 Up
F13_SIB0_XF3,11_0->F13_SIB0_XF7,15_0 Up  F13_SIB0_XF7,15_0->F13_SIB0_XF3,11_0 Up
F13_SIB0_XF1,02_0->F13_SIB0_XF7,00_0 Up  F13_SIB0_XF7,00_0->F13_SIB0_XF1,02_0 Up
F13_SIB0_XF1,01_0->F13_SIB0_XF7,01_0 Up  F13_SIB0_XF7,01_0->F13_SIB0_XF1,01_0 Up
F13_SIB0_XF1,00_0->F13_SIB0_XF7,02_0 Up  F13_SIB0_XF7,02_0->F13_SIB0_XF1,00_0 Up

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F13_SIB0_XF1,15_0->F13_SIB0_XF7,03_0 Up	F13_SIB0_XF7,03_0->F13_SIB0_XF1,15_0 Up
F13_SIB0_XF1,14_0->F13_SIB0_XF7,04_0 Up	F13_SIB0_XF7,04_0->F13_SIB0_XF1,14_0 Up
F13_SIB0_XF1,13_0->F13_SIB0_XF7,05_0 Up	F13_SIB0_XF7,05_0->F13_SIB0_XF1,13_0 Up
F13_SIB0_XF1,12_0->F13_SIB0_XF7,06_0 Up	F13_SIB0_XF7,06_0->F13_SIB0_XF1,12_0 Up
F13_SIB0_XF1,11_0->F13_SIB0_XF7,07_0 Up	F13_SIB0_XF7,07_0->F13_SIB0_XF1,11_0 Up
F2S_SIB2_XF,12_0->F13_SIB0_XF4,00_0 Up	F13_SIB0_XF4,00_0->F2S_SIB2_XF,12_0 Up
F2S_SIB2_XF,08_0->F13_SIB0_XF4,01_0 Up	F13_SIB0_XF4,01_0->F2S_SIB2_XF,08_0 Up
F2S_SIB2_XF,14_0->F13_SIB0_XF4,02_0 Up	F13_SIB0_XF4,02_0->F2S_SIB2_XF,14_0 Up
F2S_SIB2_XF,10_0->F13_SIB0_XF4,03_0 Up	F13_SIB0_XF4,03_0->F2S_SIB2_XF,10_0 Up
F2S_SIB3_XF,12_0->F13_SIB0_XF4,04_0 Up	F13_SIB0_XF4,04_0->F2S_SIB3_XF,12_0 Up
F2S_SIB3_XF,08_0->F13_SIB0_XF4,05_0 Up	F13_SIB0_XF4,05_0->F2S_SIB3_XF,08_0 Up
F2S_SIB3_XF,14_0->F13_SIB0_XF4,06_0 Up	F13_SIB0_XF4,06_0->F2S_SIB3_XF,14_0 Up
F2S_SIB3_XF,10_0->F13_SIB0_XF4,07_0 Up	F13_SIB0_XF4,07_0->F2S_SIB3_XF,10_0 Up
F2S_SIB0_XF,12_0->F13_SIB0_XF4,08_0 Up	F13_SIB0_XF4,08_0->F2S_SIB0_XF,12_0 Up
F2S_SIB0_XF,08_0->F13_SIB0_XF4,09_0 Up	F13_SIB0_XF4,09_0->F2S_SIB0_XF,08_0 Up
F2S_SIB0_XF,14_0->F13_SIB0_XF4,10_0 Up	F13_SIB0_XF4,10_0->F2S_SIB0_XF,14_0 Up
F2S_SIB0_XF,10_0->F13_SIB0_XF4,11_0 Up	F13_SIB0_XF4,11_0->F2S_SIB0_XF,10_0 Up
F2S_SIB1_XF,12_0->F13_SIB0_XF4,12_0 Up	F13_SIB0_XF4,12_0->F2S_SIB1_XF,12_0 Up
F2S_SIB1_XF,08_0->F13_SIB0_XF4,13_0 Up	F13_SIB0_XF4,13_0->F2S_SIB1_XF,08_0 Up
F2S_SIB1_XF,14_0->F13_SIB0_XF4,14_0 Up	F13_SIB0_XF4,14_0->F2S_SIB1_XF,14_0 Up
F2S_SIB1_XF,10_0->F13_SIB0_XF4,15_0 Up	F13_SIB0_XF4,15_0->F2S_SIB1_XF,10_0 Up
F2S_SIB2_XF,13_0->F13_SIB0_XF6,00_0 Up	F13_SIB0_XF6,00_0->F2S_SIB2_XF,13_0 Up
F2S_SIB2_XF,09_0->F13_SIB0_XF6,01_0 Up	F13_SIB0_XF6,01_0->F2S_SIB2_XF,09_0 Up
F2S_SIB2_XF,15_0->F13_SIB0_XF6,02_0 Up	F13_SIB0_XF6,02_0->F2S_SIB2_XF,15_0 Up
F2S_SIB2_XF,11_0->F13_SIB0_XF6,03_0 Up	F13_SIB0_XF6,03_0->F2S_SIB2_XF,11_0 Up
F2S_SIB3_XF,13_0->F13_SIB0_XF6,04_0 Up	F13_SIB0_XF6,04_0->F2S_SIB3_XF,13_0 Up
F2S_SIB3_XF,09_0->F13_SIB0_XF6,05_0 Up	F13_SIB0_XF6,05_0->F2S_SIB3_XF,09_0 Up
F2S_SIB3_XF,15_0->F13_SIB0_XF6,06_0 Up	F13_SIB0_XF6,06_0->F2S_SIB3_XF,15_0 Up
F2S_SIB3_XF,11_0->F13_SIB0_XF6,07_0 Up	F13_SIB0_XF6,07_0->F2S_SIB3_XF,11_0 Up
F2S_SIB0_XF,13_0->F13_SIB0_XF6,08_0 Up	F13_SIB0_XF6,08_0->F2S_SIB0_XF,13_0 Up

F2S_SIB0_XF,09_0->F13_SIB0_XF6,09_0 Up	F13_SIB0_XF6,09_0->F2S_SIB0_XF,09_0 Up
F2S_SIB0_XF,15_0->F13_SIB0_XF6,10_0 Up	F13_SIB0_XF6,10_0->F2S_SIB0_XF,15_0 Up
F2S_SIB0_XF,11_0->F13_SIB0_XF6,11_0 Up	F13_SIB0_XF6,11_0->F2S_SIB0_XF,11_0 Up
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F2S_SIB1_XF,09_0->F13_SIB0_XF6,13_0 Up	F13_SIB0_XF6,13_0->F2S_SIB1_XF,09_0 Up
F2S_SIB1_XF,15_0->F13_SIB0_XF6,14_0 Up	F13_SIB0_XF6,14_0->F2S_SIB1_XF,15_0 Up
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F13_SIB0_XF5,00_0->F2S_SIB2_XF,12_0 Up	F2S_SIB2_XF,12_0->F13_SIB0_XF5,00_0 Up
F13_SIB0_XF5,01_0->F2S_SIB2_XF,08_0 Up	F2S_SIB2_XF,08_0->F13_SIB0_XF5,01_0 Up
F13_SIB0_XF5,02_0->F2S_SIB2_XF,14_0 Up	F2S_SIB2_XF,14_0->F13_SIB0_XF5,02_0 Up
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F13_SIB0_XF5,04_0->F2S_SIB3_XF,12_0 Up	F2S_SIB3_XF,12_0->F13_SIB0_XF5,04_0 Up
F13_SIB0_XF5,05_0->F2S_SIB3_XF,08_0 Up	F2S_SIB3_XF,08_0->F13_SIB0_XF5,05_0 Up
F13_SIB0_XF5,06_0->F2S_SIB3_XF,14_0 Up	F2S_SIB3_XF,14_0->F13_SIB0_XF5,06_0 Up
F13_SIB0_XF5,07_0->F2S_SIB3_XF,10_0 Up	F2S_SIB3_XF,10_0->F13_SIB0_XF5,07_0 Up
F13_SIB0_XF5,08_0->F2S_SIB0_XF,12_0 Up	F2S_SIB0_XF,12_0->F13_SIB0_XF5,08_0 Up
F13_SIB0_XF5,09_0->F2S_SIB0_XF,08_0 Up	F2S_SIB0_XF,08_0->F13_SIB0_XF5,09_0 Up
F13_SIB0_XF5,10_0->F2S_SIB0_XF,14_0 Up	F2S_SIB0_XF,14_0->F13_SIB0_XF5,10_0 Up
F13_SIB0_XF5,11_0->F2S_SIB0_XF,10_0 Up	F2S_SIB0_XF,10_0->F13_SIB0_XF5,11_0 Up
F13_SIB0_XF5,12_0->F2S_SIB1_XF,12_0 Up	F2S_SIB1_XF,12_0->F13_SIB0_XF5,12_0 Up
F13_SIB0_XF5,13_0->F2S_SIB1_XF,08_0 Up	F2S_SIB1_XF,08_0->F13_SIB0_XF5,13_0 Up
F13_SIB0_XF5,14_0->F2S_SIB1_XF,14_0 Up	F2S_SIB1_XF,14_0->F13_SIB0_XF5,14_0 Up
F13_SIB0_XF5,15_0->F2S_SIB1_XF,10_0 Up	F2S_SIB1_XF,10_0->F13_SIB0_XF5,15_0 Up
F13_SIB0_XF7,00_0->F2S_SIB2_XF,13_0 Up	F2S_SIB2_XF,13_0->F13_SIB0_XF7,00_0 Up
F13_SIB0_XF7,01_0->F2S_SIB2_XF,09_0 Up	F2S_SIB2_XF,09_0->F13_SIB0_XF7,01_0 Up
F13_SIB0_XF7,02_0->F2S_SIB2_XF,15_0 Up	F2S_SIB2_XF,15_0->F13_SIB0_XF7,02_0 Up
F13_SIB0_XF7,03_0->F2S_SIB2_XF,11_0 Up	F2S_SIB2_XF,11_0->F13_SIB0_XF7,03_0 Up
F13_SIB0_XF7,04_0->F2S_SIB3_XF,13_0 Up	F2S_SIB3_XF,13_0->F13_SIB0_XF7,04_0 Up
F13_SIB0_XF7,05_0->F2S_SIB3_XF,09_0 Up	F2S_SIB3_XF,09_0->F13_SIB0_XF7,05_0 Up
F13_SIB0_XF7,06_0->F2S_SIB3_XF,15_0 Up	F2S_SIB3_XF,15_0->F13_SIB0_XF7,06_0 Up

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F13_SIB0_XF7,07_0->F2S_SIB3_XF,11_0 Up    F2S_SIB3_XF,11_0->F13_SIB0_XF7,07_0 Up
F13_SIB0_XF7,08_0->F2S_SIB0_XF,13_0 Up    F2S_SIB0_XF,13_0->F13_SIB0_XF7,08_0 Up
F13_SIB0_XF7,09_0->F2S_SIB0_XF,09_0 Up    F2S_SIB0_XF,09_0->F13_SIB0_XF7,09_0 Up
F13_SIB0_XF7,10_0->F2S_SIB0_XF,15_0 Up    F2S_SIB0_XF,15_0->F13_SIB0_XF7,10_0 Up
F13_SIB0_XF7,11_0->F2S_SIB0_XF,11_0 Up    F2S_SIB0_XF,11_0->F13_SIB0_XF7,11_0 Up
F13_SIB0_XF7,12_0->F2S_SIB1_XF,13_0 Up    F2S_SIB1_XF,13_0->F13_SIB0_XF7,12_0 Up
F13_SIB0_XF7,13_0->F2S_SIB1_XF,09_0 Up    F2S_SIB1_XF,09_0->F13_SIB0_XF7,13_0 Up
F13_SIB0_XF7,14_0->F2S_SIB1_XF,15_0 Up    F2S_SIB1_XF,15_0->F13_SIB0_XF7,14_0 Up
F13_SIB0_XF7,15_0->F2S_SIB1_XF,11_0 Up    F2S_SIB1_XF,11_0->F13_SIB0_XF7,15_0 Up

...

```

### show chassis fabric topology (PTX5000 Router)

```
user@host> show chassis fabric topology
```

```

In-link  : FPC# FE# TQ# (TQ-TX sub-chnl #) ->
           SIB# TF#_FCORE# (TF-RX port#, TF-RX sub-chn#, TF-RX inst#)

Out-link  : SIB# TF#_FCORE# (TF-TX port#, TF-TX sub-chn#, TF-TX inst#) ->
           FPC# FE# TQ# (TQ-RX sub-chnl #)
(6, 4, 06) in FPC02FE0TQ0(02)->S01F0_0(6,4,06) will be TF Rx Port 6, TF CCL Rx
Sub-Channel 4, TF CCL Rx Instance 6.
(2, 7, 10) in S01F0_0(2,7,10)->FPC02FE0TQ0(02) will be TF-Tx Port 2, TF CCL Tx
Sub-channel 7, TF CCL Tx Instance 10.
SIB 0 FCHIP 0 FCORE 0 :
-----

```

In-links	State	Out-links	State
FPC00FE0TQ0(00)->S00F0_0(7,4,07)	OK	S00F0_0(3,7,11)->FPC00FE0TQ0(00)	OK
FPC00FE1TQ1(00)->S00F0_0(7,6,07)	OK	S00F0_0(3,5,11)->FPC00FE1TQ1(00)	OK
FPC00FE2TQ2(00)->S00F0_0(7,5,07)	OK	S00F0_0(3,6,11)->FPC00FE2TQ2(00)	OK
FPC00FE3TQ3(00)->S00F0_0(7,7,07)	OK	S00F0_0(3,4,11)->FPC00FE3TQ3(00)	OK
FPC01FE0TQ0(00)->S00F0_0(7,0,07)	OK	S00F0_0(3,3,11)->FPC01FE0TQ0(00)	OK
FPC01FE1TQ1(00)->S00F0_0(7,1,07)	OK	S00F0_0(3,1,11)->FPC01FE1TQ1(00)	OK
FPC01FE2TQ2(00)->S00F0_0(7,2,07)	OK	S00F0_0(3,2,11)->FPC01FE2TQ2(00)	Error
FPC01FE3TQ3(00)->S00F0_0(7,3,07)	OK	S00F0_0(3,0,11)->FPC01FE3TQ3(00)	OK
FPC02FE0TQ0(00)->S00F0_0(6,4,06)	OK	S00F0_0(2,7,10)->FPC02FE0TQ0(00)	OK
FPC02FE1TQ1(00)->S00F0_0(6,5,06)	OK	S00F0_0(2,5,10)->FPC02FE1TQ1(00)	OK
FPC02FE2TQ2(00)->S00F0_0(6,6,06)	OK	S00F0_0(2,6,10)->FPC02FE2TQ2(00)	OK
FPC02FE3TQ3(00)->S00F0_0(6,7,06)	OK	S00F0_0(2,4,10)->FPC02FE3TQ3(00)	OK
FPC03FE0TQ0(00)->S00F0_0(6,0,06)	Down	S00F0_0(2,3,10)->FPC03FE0TQ0(00)	Down
FPC03FE1TQ1(00)->S00F0_0(6,1,06)	Down	S00F0_0(2,0,10)->FPC03FE1TQ1(00)	Down
FPC03FE2TQ2(00)->S00F0_0(6,2,06)	Down	S00F0_0(2,2,10)->FPC03FE2TQ2(00)	Down
FPC03FE3TQ3(00)->S00F0_0(6,3,06)	Down	S00F0_0(2,1,10)->FPC03FE3TQ3(00)	Down
FPC04FE0TQ0(00)->S00F0_0(5,4,05)	OK	S00F0_0(1,7,09)->FPC04FE0TQ0(00)	OK
FPC04FE1TQ1(00)->S00F0_0(5,5,05)	OK	S00F0_0(1,6,09)->FPC04FE1TQ1(00)	OK
FPC04FE2TQ2(00)->S00F0_0(5,6,05)	OK	S00F0_0(1,4,09)->FPC04FE2TQ2(00)	OK
FPC04FE3TQ3(00)->S00F0_0(5,7,05)	OK	S00F0_0(1,5,09)->FPC04FE3TQ3(00)	OK
FPC05FE0TQ0(00)->S00F0_0(5,0,05)	OK	S00F0_0(1,3,09)->FPC05FE0TQ0(00)	OK



```

FPC05FE1TQ1(00)->S00F0_0(5,1,05) OK      S00F0_0(1,0,09)->FPC05FE1TQ1(00) OK
FPC05FE2TQ2(00)->S00F0_0(5,2,05) OK      S00F0_0(1,2,09)->FPC05FE2TQ2(00) OK
FPC05FE3TQ3(00)->S00F0_0(5,3,05) OK      S00F0_0(1,1,09)->FPC05FE3TQ3(00) OK
FPC06FE0TQ0(00)->S00F0_0(4,4,04) Down    S00F0_0(0,7,08)->FPC06FE0TQ0(00) Down
FPC06FE1TQ1(00)->S00F0_0(4,5,04) Down    S00F0_0(0,5,08)->FPC06FE1TQ1(00) Down
FPC06FE2TQ2(00)->S00F0_0(4,6,04) Down    S00F0_0(0,6,08)->FPC06FE2TQ2(00) Down
FPC06FE3TQ3(00)->S00F0_0(4,7,04) Down    S00F0_0(0,4,08)->FPC06FE3TQ3(00) Down
FPC07FE0TQ0(00)->S00F0_0(4,2,04) Down    S00F0_0(0,3,08)->FPC07FE0TQ0(00) Down
FPC07FE1TQ1(00)->S00F0_0(4,0,04) Down    S00F0_0(0,0,08)->FPC07FE1TQ1(00) Down
FPC07FE2TQ2(00)->S00F0_0(4,1,04) Down    S00F0_0(0,1,08)->FPC07FE2TQ2(00) Down
FPC07FE3TQ3(00)->S00F0_0(4,3,04) Down    S00F0_0(0,2,08)->FPC07FE3TQ3(00) Down

```

SIB 0 FCHIP 0 FCORE 1 :

In-links	State	Out-links	State
FPC00FE0TQ0(01)->S00F0_1(3,4,11)	OK	S00F0_1(7,6,07)->FPC00FE0TQ0(01)	OK
FPC00FE1TQ1(01)->S00F0_1(3,5,11)	OK	S00F0_1(7,4,07)->FPC00FE1TQ1(01)	OK
FPC00FE2TQ2(01)->S00F0_1(3,6,11)	OK	S00F0_1(7,7,07)->FPC00FE2TQ2(01)	OK
FPC00FE3TQ3(01)->S00F0_1(3,7,11)	OK	S00F0_1(7,5,07)->FPC00FE3TQ3(01)	OK
FPC01FE0TQ0(01)->S00F0_1(3,0,11)	OK	S00F0_1(7,2,07)->FPC01FE0TQ0(01)	OK
FPC01FE1TQ1(01)->S00F0_1(3,1,11)	OK	S00F0_1(7,0,07)->FPC01FE1TQ1(01)	OK
FPC01FE2TQ2(01)->S00F0_1(3,2,11)	OK	S00F0_1(7,3,07)->FPC01FE2TQ2(01)	OK
FPC01FE3TQ3(01)->S00F0_1(3,3,11)	OK	S00F0_1(7,1,07)->FPC01FE3TQ3(01)	OK
FPC02FE0TQ0(01)->S00F0_1(2,4,10)	OK	S00F0_1(6,5,06)->FPC02FE0TQ0(01)	OK
FPC02FE1TQ1(01)->S00F0_1(2,5,10)	OK	S00F0_1(6,4,06)->FPC02FE1TQ1(01)	OK
FPC02FE2TQ2(01)->S00F0_1(2,6,10)	OK	S00F0_1(6,7,06)->FPC02FE2TQ2(01)	OK
FPC02FE3TQ3(01)->S00F0_1(2,7,10)	OK	S00F0_1(6,6,06)->FPC02FE3TQ3(01)	OK
FPC03FE0TQ0(01)->S00F0_1(2,0,10)	Down	S00F0_1(6,1,06)->FPC03FE0TQ0(01)	Down
FPC03FE1TQ1(01)->S00F0_1(2,1,10)	Down	S00F0_1(6,0,06)->FPC03FE1TQ1(01)	Down
FPC03FE2TQ2(01)->S00F0_1(2,2,10)	Down	S00F0_1(6,3,06)->FPC03FE2TQ2(01)	Down
FPC03FE3TQ3(01)->S00F0_1(2,3,10)	Down	S00F0_1(6,2,06)->FPC03FE3TQ3(01)	Down
FPC04FE0TQ0(01)->S00F0_1(1,4,09)	OK	S00F0_1(5,5,05)->FPC04FE0TQ0(01)	OK
FPC04FE1TQ1(01)->S00F0_1(1,5,09)	OK	S00F0_1(5,4,05)->FPC04FE1TQ1(01)	OK
FPC04FE2TQ2(01)->S00F0_1(1,6,09)	OK	S00F0_1(5,7,05)->FPC04FE2TQ2(01)	OK
FPC04FE3TQ3(01)->S00F0_1(1,7,09)	OK	S00F0_1(5,6,05)->FPC04FE3TQ3(01)	OK
FPC05FE0TQ0(01)->S00F0_1(1,0,09)	OK	S00F0_1(5,1,05)->FPC05FE0TQ0(01)	OK
FPC05FE1TQ1(01)->S00F0_1(1,1,09)	OK	S00F0_1(5,0,05)->FPC05FE1TQ1(01)	OK
FPC05FE2TQ2(01)->S00F0_1(1,2,09)	OK	S00F0_1(5,3,05)->FPC05FE2TQ2(01)	OK
FPC05FE3TQ3(01)->S00F0_1(1,3,09)	OK	S00F0_1(5,2,05)->FPC05FE3TQ3(01)	OK
FPC06FE0TQ0(01)->S00F0_1(0,4,08)	Down	S00F0_1(4,7,04)->FPC06FE0TQ0(01)	Down
FPC06FE1TQ1(01)->S00F0_1(0,5,08)	Down	S00F0_1(4,0,04)->FPC06FE1TQ1(01)	Down
FPC06FE2TQ2(01)->S00F0_1(0,6,08)	Down	S00F0_1(4,6,04)->FPC06FE2TQ2(01)	Down
FPC06FE3TQ3(01)->S00F0_1(0,7,08)	Down	S00F0_1(4,1,04)->FPC06FE3TQ3(01)	Down
FPC07FE0TQ0(01)->S00F0_1(0,0,08)	Down	S00F0_1(4,3,04)->FPC07FE0TQ0(01)	Down
FPC07FE1TQ1(01)->S00F0_1(0,1,08)	Down	S00F0_1(4,4,04)->FPC07FE1TQ1(01)	Down
FPC07FE2TQ2(01)->S00F0_1(0,2,08)	Down	S00F0_1(4,2,04)->FPC07FE2TQ2(01)	Down
FPC07FE3TQ3(01)->S00F0_1(0,3,08)	Down	S00F0_1(4,5,04)->FPC07FE3TQ3(01)	Down

SIB 1 FCHIP 0 FCORE 0 :

In-links	State	Out-links	State
FPC00FE0TQ0(02)->S01F0_0(7,4,07)	Error	S01F0_0(3,7,11)->FPC00FE0TQ0(02)	Down
FPC00FE1TQ1(02)->S01F0_0(7,6,07)	OK	S01F0_0(3,5,11)->FPC00FE1TQ1(02)	OK
FPC00FE2TQ2(02)->S01F0_0(7,5,07)	OK	S01F0_0(3,6,11)->FPC00FE2TQ2(02)	OK
FPC00FE3TQ3(02)->S01F0_0(7,7,07)	OK	S01F0_0(3,4,11)->FPC00FE3TQ3(02)	OK
FPC01FE0TQ0(02)->S01F0_0(7,0,07)	OK	S01F0_0(3,3,11)->FPC01FE0TQ0(02)	OK
FPC01FE1TQ1(02)->S01F0_0(7,1,07)	OK	S01F0_0(3,1,11)->FPC01FE1TQ1(02)	OK
FPC01FE2TQ2(02)->S01F0_0(7,2,07)	OK	S01F0_0(3,2,11)->FPC01FE2TQ2(02)	OK

FPC01FE3TQ3(02)->S01F0_0(7,3,07)	OK	S01F0_0(3,0,11)->FPC01FE3TQ3(02)	OK
FPC02FE0TQ0(02)->S01F0_0(6,4,06)	OK	S01F0_0(2,7,10)->FPC02FE0TQ0(02)	OK
FPC02FE1TQ1(02)->S01F0_0(6,5,06)	OK	S01F0_0(2,5,10)->FPC02FE1TQ1(02)	OK
FPC02FE2TQ2(02)->S01F0_0(6,6,06)	OK	S01F0_0(2,6,10)->FPC02FE2TQ2(02)	OK
FPC02FE3TQ3(02)->S01F0_0(6,7,06)	OK	S01F0_0(2,4,10)->FPC02FE3TQ3(02)	OK
FPC03FE0TQ0(02)->S01F0_0(6,0,06)	Down	S01F0_0(2,3,10)->FPC03FE0TQ0(02)	Down
FPC03FE1TQ1(02)->S01F0_0(6,1,06)	Down	S01F0_0(2,0,10)->FPC03FE1TQ1(02)	Down
FPC03FE2TQ2(02)->S01F0_0(6,2,06)	Down	S01F0_0(2,2,10)->FPC03FE2TQ2(02)	Down
FPC03FE3TQ3(02)->S01F0_0(6,3,06)	Down	S01F0_0(2,1,10)->FPC03FE3TQ3(02)	Down
FPC04FE0TQ0(02)->S01F0_0(5,4,05)	OK	S01F0_0(1,7,09)->FPC04FE0TQ0(02)	OK
FPC04FE1TQ1(02)->S01F0_0(5,5,05)	OK	S01F0_0(1,6,09)->FPC04FE1TQ1(02)	OK
FPC04FE2TQ2(02)->S01F0_0(5,6,05)	OK	S01F0_0(1,4,09)->FPC04FE2TQ2(02)	OK
FPC04FE3TQ3(02)->S01F0_0(5,7,05)	OK	S01F0_0(1,5,09)->FPC04FE3TQ3(02)	OK
FPC05FE0TQ0(02)->S01F0_0(5,0,05)	OK	S01F0_0(1,3,09)->FPC05FE0TQ0(02)	OK
FPC05FE1TQ1(02)->S01F0_0(5,1,05)	OK	S01F0_0(1,0,09)->FPC05FE1TQ1(02)	OK
FPC05FE2TQ2(02)->S01F0_0(5,2,05)	OK	S01F0_0(1,2,09)->FPC05FE2TQ2(02)	OK
FPC05FE3TQ3(02)->S01F0_0(5,3,05)	OK	S01F0_0(1,1,09)->FPC05FE3TQ3(02)	OK
FPC06FE0TQ0(02)->S01F0_0(4,4,04)	Down	S01F0_0(0,7,08)->FPC06FE0TQ0(02)	Down
FPC06FE1TQ1(02)->S01F0_0(4,5,04)	Down	S01F0_0(0,5,08)->FPC06FE1TQ1(02)	Down
FPC06FE2TQ2(02)->S01F0_0(4,6,04)	Down	S01F0_0(0,6,08)->FPC06FE2TQ2(02)	Down
FPC06FE3TQ3(02)->S01F0_0(4,7,04)	Down	S01F0_0(0,4,08)->FPC06FE3TQ3(02)	Down
FPC07FE0TQ0(02)->S01F0_0(4,2,04)	Down	S01F0_0(0,3,08)->FPC07FE0TQ0(02)	Down
FPC07FE1TQ1(02)->S01F0_0(4,0,04)	Down	S01F0_0(0,0,08)->FPC07FE1TQ1(02)	Down
FPC07FE2TQ2(02)->S01F0_0(4,1,04)	Down	S01F0_0(0,1,08)->FPC07FE2TQ2(02)	Down
FPC07FE3TQ3(02)->S01F0_0(4,3,04)	Down	S01F0_0(0,2,08)->FPC07FE3TQ3(02)	Down

## SIB 1 FCHIP 0 FCORE 1 :

In-links	State	Out-links	State
FPC00FE0TQ0(03)->S01F0_1(3,4,11)	OK	S01F0_1(7,6,07)->FPC00FE0TQ0(03)	OK
FPC00FE1TQ1(03)->S01F0_1(3,5,11)	OK	S01F0_1(7,4,07)->FPC00FE1TQ1(03)	OK
FPC00FE2TQ2(03)->S01F0_1(3,6,11)	OK	S01F0_1(7,7,07)->FPC00FE2TQ2(03)	OK
FPC00FE3TQ3(03)->S01F0_1(3,7,11)	OK	S01F0_1(7,5,07)->FPC00FE3TQ3(03)	OK
FPC01FE0TQ0(03)->S01F0_1(3,0,11)	OK	S01F0_1(7,2,07)->FPC01FE0TQ0(03)	OK
FPC01FE1TQ1(03)->S01F0_1(3,1,11)	OK	S01F0_1(7,0,07)->FPC01FE1TQ1(03)	OK
FPC01FE2TQ2(03)->S01F0_1(3,2,11)	OK	S01F0_1(7,3,07)->FPC01FE2TQ2(03)	OK
FPC01FE3TQ3(03)->S01F0_1(3,3,11)	OK	S01F0_1(7,1,07)->FPC01FE3TQ3(03)	OK
FPC02FE0TQ0(03)->S01F0_1(2,4,10)	OK	S01F0_1(6,5,06)->FPC02FE0TQ0(03)	OK
FPC02FE1TQ1(03)->S01F0_1(2,5,10)	OK	S01F0_1(6,4,06)->FPC02FE1TQ1(03)	OK
FPC02FE2TQ2(03)->S01F0_1(2,6,10)	OK	S01F0_1(6,7,06)->FPC02FE2TQ2(03)	OK
FPC02FE3TQ3(03)->S01F0_1(2,7,10)	OK	S01F0_1(6,6,06)->FPC02FE3TQ3(03)	OK
FPC03FE0TQ0(03)->S01F0_1(2,0,10)	Down	S01F0_1(6,1,06)->FPC03FE0TQ0(03)	Down
FPC03FE1TQ1(03)->S01F0_1(2,1,10)	Down	S01F0_1(6,0,06)->FPC03FE1TQ1(03)	Down
FPC03FE2TQ2(03)->S01F0_1(2,2,10)	Down	S01F0_1(6,3,06)->FPC03FE2TQ2(03)	Down
FPC03FE3TQ3(03)->S01F0_1(2,3,10)	Down	S01F0_1(6,2,06)->FPC03FE3TQ3(03)	Down
FPC04FE0TQ0(03)->S01F0_1(1,4,09)	OK	S01F0_1(5,5,05)->FPC04FE0TQ0(03)	OK
FPC04FE1TQ1(03)->S01F0_1(1,5,09)	OK	S01F0_1(5,4,05)->FPC04FE1TQ1(03)	OK
FPC04FE2TQ2(03)->S01F0_1(1,6,09)	OK	S01F0_1(5,7,05)->FPC04FE2TQ2(03)	OK
FPC04FE3TQ3(03)->S01F0_1(1,7,09)	OK	S01F0_1(5,6,05)->FPC04FE3TQ3(03)	OK
FPC05FE0TQ0(03)->S01F0_1(1,0,09)	OK	S01F0_1(5,1,05)->FPC05FE0TQ0(03)	OK
FPC05FE1TQ1(03)->S01F0_1(1,1,09)	OK	S01F0_1(5,0,05)->FPC05FE1TQ1(03)	OK
FPC05FE2TQ2(03)->S01F0_1(1,2,09)	OK	S01F0_1(5,3,05)->FPC05FE2TQ2(03)	OK
FPC05FE3TQ3(03)->S01F0_1(1,3,09)	OK	S01F0_1(5,2,05)->FPC05FE3TQ3(03)	OK
FPC06FE0TQ0(03)->S01F0_1(0,4,08)	Down	S01F0_1(4,7,04)->FPC06FE0TQ0(03)	Down
FPC06FE1TQ1(03)->S01F0_1(0,5,08)	Down	S01F0_1(4,0,04)->FPC06FE1TQ1(03)	Down
FPC06FE2TQ2(03)->S01F0_1(0,6,08)	Down	S01F0_1(4,6,04)->FPC06FE2TQ2(03)	Down
FPC06FE3TQ3(03)->S01F0_1(0,7,08)	Down	S01F0_1(4,1,04)->FPC06FE3TQ3(03)	Down
FPC07FE0TQ0(03)->S01F0_1(0,0,08)	Down	S01F0_1(4,3,04)->FPC07FE0TQ0(03)	Down
FPC07FE1TQ1(03)->S01F0_1(0,1,08)	Down	S01F0_1(4,4,04)->FPC07FE1TQ1(03)	Down

```

FPC07FE2TQ2(03)->S01F0_1(0,2,08) Down    S01F0_1(4,2,04)->FPC07FE2TQ2(03) Down
FPC07FE3TQ3(03)->S01F0_1(0,3,08) Down    S01F0_1(4,5,04)->FPC07FE3TQ3(03) Down

```

### show chassis fabric topology (PTX3000 Router)

```
user@host> show chassis fabric topology
```

```

In-link  : FPC# FE# TQ# (TQ-TX sub-chnl #) ->
           SIB# TF#_FCORE# (TF-RX port#, TF-RX sub-chn#, TF-RX inst#)

```

```

Out-link  : SIB# TF#_FCORE# (TF-TX port#, TF-TX sub-chn#, TF-TX inst#) ->
           FPC# FE# TQ# (TQ-RX sub-chnl #)

```

```
SIB 0 FCHIP 0 FCORE 0 :
```

In-links	State	Out-links	State
FPC00FE0TQ0(00)->S00F0_0(7,0,07)	Down	S00F0_0(3,0,11)->FPC00FE0TQ0(00)	Down
FPC00FE1TQ1(00)->S00F0_0(7,1,07)	Down	S00F0_0(3,1,11)->FPC00FE1TQ1(00)	Down
FPC02FE0TQ0(00)->S00F0_0(6,0,06)	Down	S00F0_0(2,0,10)->FPC02FE0TQ0(00)	Down
FPC02FE1TQ1(00)->S00F0_0(6,1,06)	Down	S00F0_0(2,1,10)->FPC02FE1TQ1(00)	Down
FPC04FE0TQ0(00)->S00F0_0(5,0,05)	Down	S00F0_0(1,0,09)->FPC04FE0TQ0(00)	Down
FPC04FE1TQ1(00)->S00F0_0(5,1,05)	Down	S00F0_0(1,1,09)->FPC04FE1TQ1(00)	Down
FPC06FE0TQ0(00)->S00F0_0(4,0,04)	Down	S00F0_0(0,0,08)->FPC06FE0TQ0(00)	Down
FPC06FE1TQ1(00)->S00F0_0(4,1,04)	Down	S00F0_0(0,1,08)->FPC06FE1TQ1(00)	Down
FPC08FE0TQ0(00)->S00F0_0(4,2,04)	OK	S00F0_0(0,2,08)->FPC08FE0TQ0(00)	OK
FPC08FE1TQ1(00)->S00F0_0(4,3,04)	OK	S00F0_0(0,3,08)->FPC08FE1TQ1(00)	OK
FPC10FE0TQ0(00)->S00F0_0(5,2,05)	Down	S00F0_0(1,2,09)->FPC10FE0TQ0(00)	Down
FPC10FE1TQ1(00)->S00F0_0(5,3,05)	Down	S00F0_0(1,3,09)->FPC10FE1TQ1(00)	Down
FPC12FE0TQ0(00)->S00F0_0(7,2,07)	OK	S00F0_0(3,2,11)->FPC12FE0TQ0(00)	OK
FPC12FE1TQ1(00)->S00F0_0(7,3,07)	OK	S00F0_0(3,3,11)->FPC12FE1TQ1(00)	OK
FPC14FE0TQ0(00)->S00F0_0(7,4,07)	Down	S00F0_0(3,4,11)->FPC14FE0TQ0(00)	Down
FPC14FE1TQ1(00)->S00F0_0(7,5,07)	Down	S00F0_0(3,5,11)->FPC14FE1TQ1(00)	Down

```
SIB 0 FCHIP 0 FCORE 1 :
```

In-links	State	Out-links	State
FPC00FE0TQ0(01)->S00F0_1(3,0,11)	Down	S00F0_1(7,0,07)->FPC00FE0TQ0(01)	Down
FPC00FE1TQ1(01)->S00F0_1(3,1,11)	Down	S00F0_1(7,1,07)->FPC00FE1TQ1(01)	Down
FPC02FE0TQ0(01)->S00F0_1(2,0,10)	Down	S00F0_1(6,0,06)->FPC02FE0TQ0(01)	Down
FPC02FE1TQ1(01)->S00F0_1(2,1,10)	Down	S00F0_1(6,1,06)->FPC02FE1TQ1(01)	Down
FPC04FE0TQ0(01)->S00F0_1(1,0,09)	Down	S00F0_1(4,0,04)->FPC04FE0TQ0(01)	Down
FPC04FE1TQ1(01)->S00F0_1(1,1,09)	Down	S00F0_1(4,1,04)->FPC04FE1TQ1(01)	Down
FPC06FE0TQ0(01)->S00F0_1(0,0,08)	Down	S00F0_1(4,2,04)->FPC06FE0TQ0(01)	Down
FPC06FE1TQ1(01)->S00F0_1(0,1,08)	Down	S00F0_1(4,3,04)->FPC06FE1TQ1(01)	Down
FPC08FE0TQ0(01)->S00F0_1(0,2,08)	OK	S00F0_1(4,4,04)->FPC08FE0TQ0(01)	OK
FPC08FE1TQ1(01)->S00F0_1(0,3,08)	OK	S00F0_1(4,5,04)->FPC08FE1TQ1(01)	OK
FPC10FE0TQ0(01)->S00F0_1(1,2,09)	Down	S00F0_1(5,0,05)->FPC10FE0TQ0(01)	Down
FPC10FE1TQ1(01)->S00F0_1(1,3,09)	Down	S00F0_1(5,1,05)->FPC10FE1TQ1(01)	Down
FPC12FE0TQ0(01)->S00F0_1(2,2,10)	OK	S00F0_1(6,2,06)->FPC12FE0TQ0(01)	OK
FPC12FE1TQ1(01)->S00F0_1(2,3,10)	OK	S00F0_1(6,3,06)->FPC12FE1TQ1(01)	OK
FPC14FE0TQ0(01)->S00F0_1(3,2,11)	Down	S00F0_1(7,2,07)->FPC14FE0TQ0(01)	Down
FPC14FE1TQ1(01)->S00F0_1(3,3,11)	Down	S00F0_1(7,3,07)->FPC14FE1TQ1(01)	Down

```
SIB 1 FCHIP 0 FCORE 0 :
```

In-links	State	Out-links	State
FPC00FE0TQ0(02)->S01F0_0(7,0,07)	Down	S01F0_0(3,0,11)->FPC00FE0TQ0(02)	Down
FPC00FE1TQ1(02)->S01F0_0(7,1,07)	Down	S01F0_0(3,1,11)->FPC00FE1TQ1(02)	Down

```
FPC02FE0TQ0(02)->S01F0_0(6,0,06) Down    S01F0_0(2,0,10)->FPC02FE0TQ0(02) Down
FPC02FE1TQ1(02)->S01F0_0(6,1,06) Down    S01F0_0(2,1,10)->FPC02FE1TQ1(02) Down
---(more)---[abort]
```

```
user@host> show chassis fabric topology | no-more
```

```
In-link  : FPC# FE# TQ# (TQ-TX sub-chnl #) ->
           SIB# TF#_FCORE# (TF-RX port#, TF-RX sub-chn#, TF-RX inst#)
```

```
Out-link : SIB# TF#_FCORE# (TF-TX port#, TF-TX sub-chn#, TF-TX inst#) ->
           FPC# FE# TQ# (TQ-RX sub-chnl #)
```

```
SIB 0 FCHIP 0 FCORE 0 :
```

In-links	State	Out-links	State
FPC00FE0TQ0(00)->S00F0_0(7,0,07)	Down	S00F0_0(3,0,11)->FPC00FE0TQ0(00)	Down
FPC00FE1TQ1(00)->S00F0_0(7,1,07)	Down	S00F0_0(3,1,11)->FPC00FE1TQ1(00)	Down
FPC02FE0TQ0(00)->S00F0_0(6,0,06)	Down	S00F0_0(2,0,10)->FPC02FE0TQ0(00)	Down
FPC02FE1TQ1(00)->S00F0_0(6,1,06)	Down	S00F0_0(2,1,10)->FPC02FE1TQ1(00)	Down
FPC04FE0TQ0(00)->S00F0_0(5,0,05)	Down	S00F0_0(1,0,09)->FPC04FE0TQ0(00)	Down
FPC04FE1TQ1(00)->S00F0_0(5,1,05)	Down	S00F0_0(1,1,09)->FPC04FE1TQ1(00)	Down
FPC06FE0TQ0(00)->S00F0_0(4,0,04)	Down	S00F0_0(0,0,08)->FPC06FE0TQ0(00)	Down
FPC06FE1TQ1(00)->S00F0_0(4,1,04)	Down	S00F0_0(0,1,08)->FPC06FE1TQ1(00)	Down
FPC08FE0TQ0(00)->S00F0_0(4,2,04)	OK	S00F0_0(0,2,08)->FPC08FE0TQ0(00)	OK
FPC08FE1TQ1(00)->S00F0_0(4,3,04)	OK	S00F0_0(0,3,08)->FPC08FE1TQ1(00)	OK
FPC10FE0TQ0(00)->S00F0_0(5,2,05)	Down	S00F0_0(1,2,09)->FPC10FE0TQ0(00)	Down
FPC10FE1TQ1(00)->S00F0_0(5,3,05)	Down	S00F0_0(1,3,09)->FPC10FE1TQ1(00)	Down
FPC12FE0TQ0(00)->S00F0_0(7,2,07)	OK	S00F0_0(3,2,11)->FPC12FE0TQ0(00)	OK
FPC12FE1TQ1(00)->S00F0_0(7,3,07)	OK	S00F0_0(3,3,11)->FPC12FE1TQ1(00)	OK
FPC14FE0TQ0(00)->S00F0_0(7,4,07)	Down	S00F0_0(3,4,11)->FPC14FE0TQ0(00)	Down
FPC14FE1TQ1(00)->S00F0_0(7,5,07)	Down	S00F0_0(3,5,11)->FPC14FE1TQ1(00)	Down

```
SIB 0 FCHIP 0 FCORE 1 :
```

In-links	State	Out-links	State
FPC00FE0TQ0(01)->S00F0_1(3,0,11)	Down	S00F0_1(7,0,07)->FPC00FE0TQ0(01)	Down
FPC00FE1TQ1(01)->S00F0_1(3,1,11)	Down	S00F0_1(7,1,07)->FPC00FE1TQ1(01)	Down
FPC02FE0TQ0(01)->S00F0_1(2,0,10)	Down	S00F0_1(6,0,06)->FPC02FE0TQ0(01)	Down
FPC02FE1TQ1(01)->S00F0_1(2,1,10)	Down	S00F0_1(6,1,06)->FPC02FE1TQ1(01)	Down
FPC04FE0TQ0(01)->S00F0_1(1,0,09)	Down	S00F0_1(4,0,04)->FPC04FE0TQ0(01)	Down
FPC04FE1TQ1(01)->S00F0_1(1,1,09)	Down	S00F0_1(4,1,04)->FPC04FE1TQ1(01)	Down
FPC06FE0TQ0(01)->S00F0_1(0,0,08)	Down	S00F0_1(4,2,04)->FPC06FE0TQ0(01)	Down
FPC06FE1TQ1(01)->S00F0_1(0,1,08)	Down	S00F0_1(4,3,04)->FPC06FE1TQ1(01)	Down
FPC08FE0TQ0(01)->S00F0_1(0,2,08)	OK	S00F0_1(4,4,04)->FPC08FE0TQ0(01)	OK
FPC08FE1TQ1(01)->S00F0_1(0,3,08)	OK	S00F0_1(4,5,04)->FPC08FE1TQ1(01)	OK
FPC10FE0TQ0(01)->S00F0_1(1,2,09)	Down	S00F0_1(5,0,05)->FPC10FE0TQ0(01)	Down
FPC10FE1TQ1(01)->S00F0_1(1,3,09)	Down	S00F0_1(5,1,05)->FPC10FE1TQ1(01)	Down
FPC12FE0TQ0(01)->S00F0_1(2,2,10)	OK	S00F0_1(6,2,06)->FPC12FE0TQ0(01)	OK
FPC12FE1TQ1(01)->S00F0_1(2,3,10)	OK	S00F0_1(6,3,06)->FPC12FE1TQ1(01)	OK
FPC14FE0TQ0(01)->S00F0_1(3,2,11)	Down	S00F0_1(7,2,07)->FPC14FE0TQ0(01)	Down
FPC14FE1TQ1(01)->S00F0_1(3,3,11)	Down	S00F0_1(7,3,07)->FPC14FE1TQ1(01)	Down

```
SIB 1 FCHIP 0 FCORE 0 :
```

In-links	State	Out-links	State
FPC00FE0TQ0(02)->S01F0_0(7,0,07)	Down	S01F0_0(3,0,11)->FPC00FE0TQ0(02)	Down
FPC00FE1TQ1(02)->S01F0_0(7,1,07)	Down	S01F0_0(3,1,11)->FPC00FE1TQ1(02)	Down
FPC02FE0TQ0(02)->S01F0_0(6,0,06)	Down	S01F0_0(2,0,10)->FPC02FE0TQ0(02)	Down

```

FPC02FE1TQ1(02)->S01F0_0(6,1,06) Down    S01F0_0(2,1,10)->FPC02FE1TQ1(02) Down
FPC04FE0TQ0(02)->S01F0_0(5,0,05) Down    S01F0_0(1,0,09)->FPC04FE0TQ0(02) Down
FPC04FE1TQ1(02)->S01F0_0(5,1,05) Down    S01F0_0(1,1,09)->FPC04FE1TQ1(02) Down
FPC06FE0TQ0(02)->S01F0_0(4,0,04) Down    S01F0_0(0,0,08)->FPC06FE0TQ0(02) Down
FPC06FE1TQ1(02)->S01F0_0(4,1,04) Down    S01F0_0(0,1,08)->FPC06FE1TQ1(02) Down
FPC08FE0TQ0(02)->S01F0_0(4,2,04) OK      S01F0_0(0,2,08)->FPC08FE0TQ0(02) OK
FPC08FE1TQ1(02)->S01F0_0(4,3,04) OK      S01F0_0(0,3,08)->FPC08FE1TQ1(02) OK
FPC10FE0TQ0(02)->S01F0_0(5,2,05) Down    S01F0_0(1,2,09)->FPC10FE0TQ0(02) Down
FPC10FE1TQ1(02)->S01F0_0(5,3,05) Down    S01F0_0(1,3,09)->FPC10FE1TQ1(02) Down
FPC12FE0TQ0(02)->S01F0_0(7,2,07) OK      S01F0_0(3,2,11)->FPC12FE0TQ0(02) OK
FPC12FE1TQ1(02)->S01F0_0(7,3,07) OK      S01F0_0(3,3,11)->FPC12FE1TQ1(02) OK
FPC14FE0TQ0(02)->S01F0_0(7,4,07) Down    S01F0_0(3,4,11)->FPC14FE0TQ0(02) Down
FPC14FE1TQ1(02)->S01F0_0(7,5,07) Down    S01F0_0(3,5,11)->FPC14FE1TQ1(02) Down

```

SIB 1 FCHIP 0 FCORE 1 :

In-links	State	Out-links	State
FPC00FE0TQ0(03)->S01F0_1(3,0,11)	Down	S01F0_1(7,0,07)->FPC00FE0TQ0(03)	Down
FPC00FE1TQ1(03)->S01F0_1(3,1,11)	Down	S01F0_1(7,1,07)->FPC00FE1TQ1(03)	Down
FPC02FE0TQ0(03)->S01F0_1(2,0,10)	Down	S01F0_1(6,0,06)->FPC02FE0TQ0(03)	Down
FPC02FE1TQ1(03)->S01F0_1(2,1,10)	Down	S01F0_1(6,1,06)->FPC02FE1TQ1(03)	Down
FPC04FE0TQ0(03)->S01F0_1(1,0,09)	Down	S01F0_1(4,0,04)->FPC04FE0TQ0(03)	Down
FPC04FE1TQ1(03)->S01F0_1(1,1,09)	Down	S01F0_1(4,1,04)->FPC04FE1TQ1(03)	Down
FPC06FE0TQ0(03)->S01F0_1(0,0,08)	Down	S01F0_1(4,2,04)->FPC06FE0TQ0(03)	Down
FPC06FE1TQ1(03)->S01F0_1(0,1,08)	Down	S01F0_1(4,3,04)->FPC06FE1TQ1(03)	Down
FPC08FE0TQ0(03)->S01F0_1(0,2,08)	OK	S01F0_1(4,4,04)->FPC08FE0TQ0(03)	OK
FPC08FE1TQ1(03)->S01F0_1(0,3,08)	OK	S01F0_1(4,5,04)->FPC08FE1TQ1(03)	OK
FPC10FE0TQ0(03)->S01F0_1(1,2,09)	Down	S01F0_1(5,0,05)->FPC10FE0TQ0(03)	Down
FPC10FE1TQ1(03)->S01F0_1(1,3,09)	Down	S01F0_1(5,1,05)->FPC10FE1TQ1(03)	Down
FPC12FE0TQ0(03)->S01F0_1(2,2,10)	OK	S01F0_1(6,2,06)->FPC12FE0TQ0(03)	OK
FPC12FE1TQ1(03)->S01F0_1(2,3,10)	OK	S01F0_1(6,3,06)->FPC12FE1TQ1(03)	OK
FPC14FE0TQ0(03)->S01F0_1(3,2,11)	Down	S01F0_1(7,2,07)->FPC14FE0TQ0(03)	Down
FPC14FE1TQ1(03)->S01F0_1(3,3,11)	Down	S01F0_1(7,3,07)->FPC14FE1TQ1(03)	Down

SIB 2 FCHIP 0 FCORE 0 :

In-links	State	Out-links	State
FPC00FE0TQ0(04)->S02F0_0(7,0,07)	Down	S02F0_0(3,0,11)->FPC00FE0TQ0(04)	Down
FPC00FE1TQ1(04)->S02F0_0(7,1,07)	Down	S02F0_0(3,1,11)->FPC00FE1TQ1(04)	Down
FPC02FE0TQ0(04)->S02F0_0(6,0,06)	Down	S02F0_0(2,0,10)->FPC02FE0TQ0(04)	Down
FPC02FE1TQ1(04)->S02F0_0(6,1,06)	Down	S02F0_0(2,1,10)->FPC02FE1TQ1(04)	Down
FPC04FE0TQ0(04)->S02F0_0(5,0,05)	Down	S02F0_0(1,0,09)->FPC04FE0TQ0(04)	Down
FPC04FE1TQ1(04)->S02F0_0(5,1,05)	Down	S02F0_0(1,1,09)->FPC04FE1TQ1(04)	Down
FPC06FE0TQ0(04)->S02F0_0(4,0,04)	Down	S02F0_0(0,0,08)->FPC06FE0TQ0(04)	Down
FPC06FE1TQ1(04)->S02F0_0(4,1,04)	Down	S02F0_0(0,1,08)->FPC06FE1TQ1(04)	Down
FPC08FE0TQ0(04)->S02F0_0(4,2,04)	OK	S02F0_0(0,2,08)->FPC08FE0TQ0(04)	OK
FPC08FE1TQ1(04)->S02F0_0(4,3,04)	OK	S02F0_0(0,3,08)->FPC08FE1TQ1(04)	OK
FPC10FE0TQ0(04)->S02F0_0(5,2,05)	Down	S02F0_0(1,2,09)->FPC10FE0TQ0(04)	Down
FPC10FE1TQ1(04)->S02F0_0(5,3,05)	Down	S02F0_0(1,3,09)->FPC10FE1TQ1(04)	Down
FPC12FE0TQ0(04)->S02F0_0(7,2,07)	OK	S02F0_0(3,2,11)->FPC12FE0TQ0(04)	OK
FPC12FE1TQ1(04)->S02F0_0(7,3,07)	OK	S02F0_0(3,3,11)->FPC12FE1TQ1(04)	OK
FPC14FE0TQ0(04)->S02F0_0(7,4,07)	Down	S02F0_0(3,4,11)->FPC14FE0TQ0(04)	Down
FPC14FE1TQ1(04)->S02F0_0(7,5,07)	Down	S02F0_0(3,5,11)->FPC14FE1TQ1(04)	Down

SIB 2 FCHIP 0 FCORE 1 :

In-links	State	Out-links	State
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FPC00FE0TQ0(05)->S02F0_1(3,0,11)	Down	S02F0_1(7,0,07)->FPC00FE0TQ0(05)	Down
FPC00FE1TQ1(05)->S02F0_1(3,1,11)	Down	S02F0_1(7,1,07)->FPC00FE1TQ1(05)	Down
FPC02FE0TQ0(05)->S02F0_1(2,0,10)	Down	S02F0_1(6,0,06)->FPC02FE0TQ0(05)	Down
FPC02FE1TQ1(05)->S02F0_1(2,1,10)	Down	S02F0_1(6,1,06)->FPC02FE1TQ1(05)	Down
FPC04FE0TQ0(05)->S02F0_1(1,0,09)	Down	S02F0_1(4,0,04)->FPC04FE0TQ0(05)	Down
FPC04FE1TQ1(05)->S02F0_1(1,1,09)	Down	S02F0_1(4,1,04)->FPC04FE1TQ1(05)	Down
FPC06FE0TQ0(05)->S02F0_1(0,0,08)	Down	S02F0_1(4,2,04)->FPC06FE0TQ0(05)	Down
FPC06FE1TQ1(05)->S02F0_1(0,1,08)	Down	S02F0_1(4,3,04)->FPC06FE1TQ1(05)	Down
FPC08FE0TQ0(05)->S02F0_1(0,2,08)	OK	S02F0_1(4,4,04)->FPC08FE0TQ0(05)	OK
FPC08FE1TQ1(05)->S02F0_1(0,3,08)	OK	S02F0_1(4,5,04)->FPC08FE1TQ1(05)	OK
FPC10FE0TQ0(05)->S02F0_1(1,2,09)	Down	S02F0_1(5,0,05)->FPC10FE0TQ0(05)	Down
FPC10FE1TQ1(05)->S02F0_1(1,3,09)	Down	S02F0_1(5,1,05)->FPC10FE1TQ1(05)	Down
FPC12FE0TQ0(05)->S02F0_1(2,2,10)	OK	S02F0_1(6,2,06)->FPC12FE0TQ0(05)	OK
FPC12FE1TQ1(05)->S02F0_1(2,3,10)	OK	S02F0_1(6,3,06)->FPC12FE1TQ1(05)	OK
FPC14FE0TQ0(05)->S02F0_1(3,2,11)	Down	S02F0_1(7,2,07)->FPC14FE0TQ0(05)	Down
FPC14FE1TQ1(05)->S02F0_1(3,3,11)	Down	S02F0_1(7,3,07)->FPC14FE1TQ1(05)	Down

## SIB 3 FCHIP 0 FCORE 0 :

In-links	State	Out-links	State
FPC00FE0TQ0(06)->S03F0_0(7,0,07)	Down	S03F0_0(3,0,11)->FPC00FE0TQ0(06)	Down
FPC00FE1TQ1(06)->S03F0_0(7,1,07)	Down	S03F0_0(3,1,11)->FPC00FE1TQ1(06)	Down
FPC02FE0TQ0(06)->S03F0_0(6,0,06)	Down	S03F0_0(2,0,10)->FPC02FE0TQ0(06)	Down
FPC02FE1TQ1(06)->S03F0_0(6,1,06)	Down	S03F0_0(2,1,10)->FPC02FE1TQ1(06)	Down
FPC04FE0TQ0(06)->S03F0_0(5,0,05)	Down	S03F0_0(1,0,09)->FPC04FE0TQ0(06)	Down
FPC04FE1TQ1(06)->S03F0_0(5,1,05)	Down	S03F0_0(1,1,09)->FPC04FE1TQ1(06)	Down
FPC06FE0TQ0(06)->S03F0_0(4,0,04)	Down	S03F0_0(0,0,08)->FPC06FE0TQ0(06)	Down
FPC06FE1TQ1(06)->S03F0_0(4,1,04)	Down	S03F0_0(0,1,08)->FPC06FE1TQ1(06)	Down
FPC08FE0TQ0(06)->S03F0_0(4,2,04)	OK	S03F0_0(0,2,08)->FPC08FE0TQ0(06)	OK
FPC08FE1TQ1(06)->S03F0_0(4,3,04)	OK	S03F0_0(0,3,08)->FPC08FE1TQ1(06)	OK
FPC10FE0TQ0(06)->S03F0_0(5,2,05)	Down	S03F0_0(1,2,09)->FPC10FE0TQ0(06)	Down
FPC10FE1TQ1(06)->S03F0_0(5,3,05)	Down	S03F0_0(1,3,09)->FPC10FE1TQ1(06)	Down
FPC12FE0TQ0(06)->S03F0_0(7,2,07)	OK	S03F0_0(3,2,11)->FPC12FE0TQ0(06)	OK
FPC12FE1TQ1(06)->S03F0_0(7,3,07)	OK	S03F0_0(3,3,11)->FPC12FE1TQ1(06)	OK
FPC14FE0TQ0(06)->S03F0_0(7,4,07)	Down	S03F0_0(3,4,11)->FPC14FE0TQ0(06)	Down
FPC14FE1TQ1(06)->S03F0_0(7,5,07)	Down	S03F0_0(3,5,11)->FPC14FE1TQ1(06)	Down

## SIB 3 FCHIP 0 FCORE 1 :

In-links	State	Out-links	State
FPC00FE0TQ0(07)->S03F0_1(3,0,11)	Down	S03F0_1(7,0,07)->FPC00FE0TQ0(07)	Down
FPC00FE1TQ1(07)->S03F0_1(3,1,11)	Down	S03F0_1(7,1,07)->FPC00FE1TQ1(07)	Down
FPC02FE0TQ0(07)->S03F0_1(2,0,10)	Down	S03F0_1(6,0,06)->FPC02FE0TQ0(07)	Down
FPC02FE1TQ1(07)->S03F0_1(2,1,10)	Down	S03F0_1(6,1,06)->FPC02FE1TQ1(07)	Down
FPC04FE0TQ0(07)->S03F0_1(1,0,09)	Down	S03F0_1(4,0,04)->FPC04FE0TQ0(07)	Down
FPC04FE1TQ1(07)->S03F0_1(1,1,09)	Down	S03F0_1(4,1,04)->FPC04FE1TQ1(07)	Down
FPC06FE0TQ0(07)->S03F0_1(0,0,08)	Down	S03F0_1(4,2,04)->FPC06FE0TQ0(07)	Down
FPC06FE1TQ1(07)->S03F0_1(0,1,08)	Down	S03F0_1(4,3,04)->FPC06FE1TQ1(07)	Down
FPC08FE0TQ0(07)->S03F0_1(0,2,08)	OK	S03F0_1(4,4,04)->FPC08FE0TQ0(07)	OK
FPC08FE1TQ1(07)->S03F0_1(0,3,08)	OK	S03F0_1(4,5,04)->FPC08FE1TQ1(07)	OK
FPC10FE0TQ0(07)->S03F0_1(1,2,09)	Down	S03F0_1(5,0,05)->FPC10FE0TQ0(07)	Down
FPC10FE1TQ1(07)->S03F0_1(1,3,09)	Down	S03F0_1(5,1,05)->FPC10FE1TQ1(07)	Down
FPC12FE0TQ0(07)->S03F0_1(2,2,10)	OK	S03F0_1(6,2,06)->FPC12FE0TQ0(07)	OK
FPC12FE1TQ1(07)->S03F0_1(2,3,10)	OK	S03F0_1(6,3,06)->FPC12FE1TQ1(07)	OK
FPC14FE0TQ0(07)->S03F0_1(3,2,11)	Down	S03F0_1(7,2,07)->FPC14FE0TQ0(07)	Down
FPC14FE1TQ1(07)->S03F0_1(3,3,11)	Down	S03F0_1(7,3,07)->FPC14FE1TQ1(07)	Down

## SIB 4 FCHIP 0 FCORE 0 :

In-links	State	Out-links	State
FPC00FE0TQ0(08)->S04F0_0(7,0,07)	Down	S04F0_0(3,0,11)->FPC00FE0TQ0(08)	Down
FPC00FE1TQ1(08)->S04F0_0(7,1,07)	Down	S04F0_0(3,1,11)->FPC00FE1TQ1(08)	Down
FPC02FE0TQ0(08)->S04F0_0(6,0,06)	Down	S04F0_0(2,0,10)->FPC02FE0TQ0(08)	Down
FPC02FE1TQ1(08)->S04F0_0(6,1,06)	Down	S04F0_0(2,1,10)->FPC02FE1TQ1(08)	Down
FPC04FE0TQ0(08)->S04F0_0(5,0,05)	Down	S04F0_0(1,0,09)->FPC04FE0TQ0(08)	Down
FPC04FE1TQ1(08)->S04F0_0(5,1,05)	Down	S04F0_0(1,1,09)->FPC04FE1TQ1(08)	Down
FPC06FE0TQ0(08)->S04F0_0(4,0,04)	Down	S04F0_0(0,0,08)->FPC06FE0TQ0(08)	Down
FPC06FE1TQ1(08)->S04F0_0(4,1,04)	Down	S04F0_0(0,1,08)->FPC06FE1TQ1(08)	Down
FPC08FE0TQ0(08)->S04F0_0(4,2,04)	OK	S04F0_0(0,2,08)->FPC08FE0TQ0(08)	OK
FPC08FE1TQ1(08)->S04F0_0(4,3,04)	OK	S04F0_0(0,3,08)->FPC08FE1TQ1(08)	OK
FPC10FE0TQ0(08)->S04F0_0(5,2,05)	Down	S04F0_0(1,2,09)->FPC10FE0TQ0(08)	Down
FPC10FE1TQ1(08)->S04F0_0(5,3,05)	Down	S04F0_0(1,3,09)->FPC10FE1TQ1(08)	Down
FPC12FE0TQ0(08)->S04F0_0(7,2,07)	OK	S04F0_0(3,2,11)->FPC12FE0TQ0(08)	OK
FPC12FE1TQ1(08)->S04F0_0(7,3,07)	OK	S04F0_0(3,3,11)->FPC12FE1TQ1(08)	OK
FPC14FE0TQ0(08)->S04F0_0(7,4,07)	Down	S04F0_0(3,4,11)->FPC14FE0TQ0(08)	Down
FPC14FE1TQ1(08)->S04F0_0(7,5,07)	Down	S04F0_0(3,5,11)->FPC14FE1TQ1(08)	Down

## SIB 4 FCHIP 0 FCORE 1 :

In-links	State	Out-links	State
FPC00FE0TQ0(09)->S04F0_1(3,0,11)	Down	S04F0_1(7,0,07)->FPC00FE0TQ0(09)	Down
FPC00FE1TQ1(09)->S04F0_1(3,1,11)	Down	S04F0_1(7,1,07)->FPC00FE1TQ1(09)	Down
FPC02FE0TQ0(09)->S04F0_1(2,0,10)	Down	S04F0_1(6,0,06)->FPC02FE0TQ0(09)	Down
FPC02FE1TQ1(09)->S04F0_1(2,1,10)	Down	S04F0_1(6,1,06)->FPC02FE1TQ1(09)	Down
FPC04FE0TQ0(09)->S04F0_1(1,0,09)	Down	S04F0_1(4,0,04)->FPC04FE0TQ0(09)	Down
FPC04FE1TQ1(09)->S04F0_1(1,1,09)	Down	S04F0_1(4,1,04)->FPC04FE1TQ1(09)	Down
FPC06FE0TQ0(09)->S04F0_1(0,0,08)	Down	S04F0_1(4,2,04)->FPC06FE0TQ0(09)	Down
FPC06FE1TQ1(09)->S04F0_1(0,1,08)	Down	S04F0_1(4,3,04)->FPC06FE1TQ1(09)	Down
FPC08FE0TQ0(09)->S04F0_1(0,2,08)	OK	S04F0_1(4,4,04)->FPC08FE0TQ0(09)	OK
FPC08FE1TQ1(09)->S04F0_1(0,3,08)	OK	S04F0_1(4,5,04)->FPC08FE1TQ1(09)	OK
FPC10FE0TQ0(09)->S04F0_1(1,2,09)	Down	S04F0_1(5,0,05)->FPC10FE0TQ0(09)	Down
FPC10FE1TQ1(09)->S04F0_1(1,3,09)	Down	S04F0_1(5,1,05)->FPC10FE1TQ1(09)	Down
FPC12FE0TQ0(09)->S04F0_1(2,2,10)	OK	S04F0_1(6,2,06)->FPC12FE0TQ0(09)	OK
FPC12FE1TQ1(09)->S04F0_1(2,3,10)	OK	S04F0_1(6,3,06)->FPC12FE1TQ1(09)	OK
FPC14FE0TQ0(09)->S04F0_1(3,2,11)	Down	S04F0_1(7,2,07)->FPC14FE0TQ0(09)	Down
FPC14FE1TQ1(09)->S04F0_1(3,3,11)	Down	S04F0_1(7,3,07)->FPC14FE1TQ1(09)	Down

## SIB 5 FCHIP 0 FCORE 0 :

In-links	State	Out-links	State
FPC00FE0TQ0(10)->S05F0_0(7,0,07)	Down	S05F0_0(3,0,11)->FPC00FE0TQ0(10)	Down
FPC00FE1TQ1(10)->S05F0_0(7,1,07)	Down	S05F0_0(3,1,11)->FPC00FE1TQ1(10)	Down
FPC02FE0TQ0(10)->S05F0_0(6,0,06)	Down	S05F0_0(2,0,10)->FPC02FE0TQ0(10)	Down
FPC02FE1TQ1(10)->S05F0_0(6,1,06)	Down	S05F0_0(2,1,10)->FPC02FE1TQ1(10)	Down
FPC04FE0TQ0(10)->S05F0_0(5,0,05)	Down	S05F0_0(1,0,09)->FPC04FE0TQ0(10)	Down
FPC04FE1TQ1(10)->S05F0_0(5,1,05)	Down	S05F0_0(1,1,09)->FPC04FE1TQ1(10)	Down
FPC06FE0TQ0(10)->S05F0_0(4,0,04)	Down	S05F0_0(0,0,08)->FPC06FE0TQ0(10)	Down
FPC06FE1TQ1(10)->S05F0_0(4,1,04)	Down	S05F0_0(0,1,08)->FPC06FE1TQ1(10)	Down
FPC08FE0TQ0(10)->S05F0_0(4,2,04)	OK	S05F0_0(0,2,08)->FPC08FE0TQ0(10)	OK
FPC08FE1TQ1(10)->S05F0_0(4,3,04)	OK	S05F0_0(0,3,08)->FPC08FE1TQ1(10)	OK
FPC10FE0TQ0(10)->S05F0_0(5,2,05)	Down	S05F0_0(1,2,09)->FPC10FE0TQ0(10)	Down
FPC10FE1TQ1(10)->S05F0_0(5,3,05)	Down	S05F0_0(1,3,09)->FPC10FE1TQ1(10)	Down
FPC12FE0TQ0(10)->S05F0_0(7,2,07)	OK	S05F0_0(3,2,11)->FPC12FE0TQ0(10)	OK
FPC12FE1TQ1(10)->S05F0_0(7,3,07)	OK	S05F0_0(3,3,11)->FPC12FE1TQ1(10)	OK
FPC14FE0TQ0(10)->S05F0_0(7,4,07)	Down	S05F0_0(3,4,11)->FPC14FE0TQ0(10)	Down

FPC14FE1TQ1(10)->S05F0\_0(7,5,07) Down      S05F0\_0(3,5,11)->FPC14FE1TQ1(10) Down

SIB 5 FCHIP 0 FCORE 1 :

In-links	State	Out-links	State
FPC00FE0TQ0(11)->S05F0_1(3,0,11)	Down	S05F0_1(7,0,07)->FPC00FE0TQ0(11)	Down
FPC00FE1TQ1(11)->S05F0_1(3,1,11)	Down	S05F0_1(7,1,07)->FPC00FE1TQ1(11)	Down
FPC02FE0TQ0(11)->S05F0_1(2,0,10)	Down	S05F0_1(6,0,06)->FPC02FE0TQ0(11)	Down
FPC02FE1TQ1(11)->S05F0_1(2,1,10)	Down	S05F0_1(6,1,06)->FPC02FE1TQ1(11)	Down
FPC04FE0TQ0(11)->S05F0_1(1,0,09)	Down	S05F0_1(4,0,04)->FPC04FE0TQ0(11)	Down
FPC04FE1TQ1(11)->S05F0_1(1,1,09)	Down	S05F0_1(4,1,04)->FPC04FE1TQ1(11)	Down
FPC06FE0TQ0(11)->S05F0_1(0,0,08)	Down	S05F0_1(4,2,04)->FPC06FE0TQ0(11)	Down
FPC06FE1TQ1(11)->S05F0_1(0,1,08)	Down	S05F0_1(4,3,04)->FPC06FE1TQ1(11)	Down
FPC08FE0TQ0(11)->S05F0_1(0,2,08)	OK	S05F0_1(4,4,04)->FPC08FE0TQ0(11)	OK
FPC08FE1TQ1(11)->S05F0_1(0,3,08)	OK	S05F0_1(4,5,04)->FPC08FE1TQ1(11)	OK
FPC10FE0TQ0(11)->S05F0_1(1,2,09)	Down	S05F0_1(5,0,05)->FPC10FE0TQ0(11)	Down
FPC10FE1TQ1(11)->S05F0_1(1,3,09)	Down	S05F0_1(5,1,05)->FPC10FE1TQ1(11)	Down
FPC12FE0TQ0(11)->S05F0_1(2,2,10)	OK	S05F0_1(6,2,06)->FPC12FE0TQ0(11)	OK
FPC12FE1TQ1(11)->S05F0_1(2,3,10)	OK	S05F0_1(6,3,06)->FPC12FE1TQ1(11)	OK
FPC14FE0TQ0(11)->S05F0_1(3,2,11)	Down	S05F0_1(7,2,07)->FPC14FE0TQ0(11)	Down
FPC14FE1TQ1(11)->S05F0_1(3,3,11)	Down	S05F0_1(7,3,07)->FPC14FE1TQ1(11)	Down

SIB 6 FCHIP 0 FCORE 0 :

In-links	State	Out-links	State
FPC00FE0TQ0(12)->S06F0_0(7,0,07)	Down	S06F0_0(3,0,11)->FPC00FE0TQ0(12)	Down
FPC00FE1TQ1(12)->S06F0_0(7,1,07)	Down	S06F0_0(3,1,11)->FPC00FE1TQ1(12)	Down
FPC02FE0TQ0(12)->S06F0_0(6,0,06)	Down	S06F0_0(2,0,10)->FPC02FE0TQ0(12)	Down
FPC02FE1TQ1(12)->S06F0_0(6,1,06)	Down	S06F0_0(2,1,10)->FPC02FE1TQ1(12)	Down
FPC04FE0TQ0(12)->S06F0_0(5,0,05)	Down	S06F0_0(1,0,09)->FPC04FE0TQ0(12)	Down
FPC04FE1TQ1(12)->S06F0_0(5,1,05)	Down	S06F0_0(1,1,09)->FPC04FE1TQ1(12)	Down
FPC06FE0TQ0(12)->S06F0_0(4,0,04)	Down	S06F0_0(0,0,08)->FPC06FE0TQ0(12)	Down
FPC06FE1TQ1(12)->S06F0_0(4,1,04)	Down	S06F0_0(0,1,08)->FPC06FE1TQ1(12)	Down
FPC08FE0TQ0(12)->S06F0_0(4,2,04)	OK	S06F0_0(0,2,08)->FPC08FE0TQ0(12)	OK
FPC08FE1TQ1(12)->S06F0_0(4,3,04)	OK	S06F0_0(0,3,08)->FPC08FE1TQ1(12)	OK
FPC10FE0TQ0(12)->S06F0_0(5,2,05)	Down	S06F0_0(1,2,09)->FPC10FE0TQ0(12)	Down
FPC10FE1TQ1(12)->S06F0_0(5,3,05)	Down	S06F0_0(1,3,09)->FPC10FE1TQ1(12)	Down
FPC12FE0TQ0(12)->S06F0_0(7,2,07)	OK	S06F0_0(3,2,11)->FPC12FE0TQ0(12)	OK
FPC12FE1TQ1(12)->S06F0_0(7,3,07)	OK	S06F0_0(3,3,11)->FPC12FE1TQ1(12)	OK
FPC14FE0TQ0(12)->S06F0_0(7,4,07)	Down	S06F0_0(3,4,11)->FPC14FE0TQ0(12)	Down
FPC14FE1TQ1(12)->S06F0_0(7,5,07)	Down	S06F0_0(3,5,11)->FPC14FE1TQ1(12)	Down

SIB 6 FCHIP 0 FCORE 1 :

In-links	State	Out-links	State
FPC00FE0TQ0(13)->S06F0_1(3,0,11)	Down	S06F0_1(7,0,07)->FPC00FE0TQ0(13)	Down
FPC00FE1TQ1(13)->S06F0_1(3,1,11)	Down	S06F0_1(7,1,07)->FPC00FE1TQ1(13)	Down
FPC02FE0TQ0(13)->S06F0_1(2,0,10)	Down	S06F0_1(6,0,06)->FPC02FE0TQ0(13)	Down
FPC02FE1TQ1(13)->S06F0_1(2,1,10)	Down	S06F0_1(6,1,06)->FPC02FE1TQ1(13)	Down
FPC04FE0TQ0(13)->S06F0_1(1,0,09)	Down	S06F0_1(4,0,04)->FPC04FE0TQ0(13)	Down
FPC04FE1TQ1(13)->S06F0_1(1,1,09)	Down	S06F0_1(4,1,04)->FPC04FE1TQ1(13)	Down
FPC06FE0TQ0(13)->S06F0_1(0,0,08)	Down	S06F0_1(4,2,04)->FPC06FE0TQ0(13)	Down
FPC06FE1TQ1(13)->S06F0_1(0,1,08)	Down	S06F0_1(4,3,04)->FPC06FE1TQ1(13)	Down
FPC08FE0TQ0(13)->S06F0_1(0,2,08)	OK	S06F0_1(4,4,04)->FPC08FE0TQ0(13)	OK
FPC08FE1TQ1(13)->S06F0_1(0,3,08)	OK	S06F0_1(4,5,04)->FPC08FE1TQ1(13)	OK
FPC10FE0TQ0(13)->S06F0_1(1,2,09)	Down	S06F0_1(5,0,05)->FPC10FE0TQ0(13)	Down
FPC10FE1TQ1(13)->S06F0_1(1,3,09)	Down	S06F0_1(5,1,05)->FPC10FE1TQ1(13)	Down



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FPC12FE0TQ0(13)->S06F0_1(2,2,10) OK      S06F0_1(6,2,06)->FPC12FE0TQ0(13) OK
FPC12FE1TQ1(13)->S06F0_1(2,3,10) OK      S06F0_1(6,3,06)->FPC12FE1TQ1(13) OK
FPC14FE0TQ0(13)->S06F0_1(3,2,11) Down    S06F0_1(7,2,07)->FPC14FE0TQ0(13) Down
FPC14FE1TQ1(13)->S06F0_1(3,3,11) Down    S06F0_1(7,3,07)->FPC14FE1TQ1(13) Down

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SIB 7 FCHIP 0 FCORE 0 :

In-links	State	Out-links	State
FPC00FE0TQ0(14)->S07F0_0(7,0,07)	Down	S07F0_0(3,0,11)->FPC00FE0TQ0(14)	Down
FPC00FE1TQ1(14)->S07F0_0(7,1,07)	Down	S07F0_0(3,1,11)->FPC00FE1TQ1(14)	Down
FPC02FE0TQ0(14)->S07F0_0(6,0,06)	Down	S07F0_0(2,0,10)->FPC02FE0TQ0(14)	Down
FPC02FE1TQ1(14)->S07F0_0(6,1,06)	Down	S07F0_0(2,1,10)->FPC02FE1TQ1(14)	Down
FPC04FE0TQ0(14)->S07F0_0(5,0,05)	Down	S07F0_0(1,0,09)->FPC04FE0TQ0(14)	Down
FPC04FE1TQ1(14)->S07F0_0(5,1,05)	Down	S07F0_0(1,1,09)->FPC04FE1TQ1(14)	Down
FPC06FE0TQ0(14)->S07F0_0(4,0,04)	Down	S07F0_0(0,0,08)->FPC06FE0TQ0(14)	Down
FPC06FE1TQ1(14)->S07F0_0(4,1,04)	Down	S07F0_0(0,1,08)->FPC06FE1TQ1(14)	Down
FPC08FE0TQ0(14)->S07F0_0(4,2,04)	OK	S07F0_0(0,2,08)->FPC08FE0TQ0(14)	OK
FPC08FE1TQ1(14)->S07F0_0(4,3,04)	OK	S07F0_0(0,3,08)->FPC08FE1TQ1(14)	OK
FPC10FE0TQ0(14)->S07F0_0(5,2,05)	Down	S07F0_0(1,2,09)->FPC10FE0TQ0(14)	Down
FPC10FE1TQ1(14)->S07F0_0(5,3,05)	Down	S07F0_0(1,3,09)->FPC10FE1TQ1(14)	Down
FPC12FE0TQ0(14)->S07F0_0(7,2,07)	OK	S07F0_0(3,2,11)->FPC12FE0TQ0(14)	OK
FPC12FE1TQ1(14)->S07F0_0(7,3,07)	OK	S07F0_0(3,3,11)->FPC12FE1TQ1(14)	OK
FPC14FE0TQ0(14)->S07F0_0(7,4,07)	Down	S07F0_0(3,4,11)->FPC14FE0TQ0(14)	Down
FPC14FE1TQ1(14)->S07F0_0(7,5,07)	Down	S07F0_0(3,5,11)->FPC14FE1TQ1(14)	Down

SIB 7 FCHIP 0 FCORE 1 :

In-links	State	Out-links	State
FPC00FE0TQ0(15)->S07F0_1(3,0,11)	Down	S07F0_1(7,0,07)->FPC00FE0TQ0(15)	Down
FPC00FE1TQ1(15)->S07F0_1(3,1,11)	Down	S07F0_1(7,1,07)->FPC00FE1TQ1(15)	Down
FPC02FE0TQ0(15)->S07F0_1(2,0,10)	Down	S07F0_1(6,0,06)->FPC02FE0TQ0(15)	Down
FPC02FE1TQ1(15)->S07F0_1(2,1,10)	Down	S07F0_1(6,1,06)->FPC02FE1TQ1(15)	Down
FPC04FE0TQ0(15)->S07F0_1(1,0,09)	Down	S07F0_1(4,0,04)->FPC04FE0TQ0(15)	Down
FPC04FE1TQ1(15)->S07F0_1(1,1,09)	Down	S07F0_1(4,1,04)->FPC04FE1TQ1(15)	Down
FPC06FE0TQ0(15)->S07F0_1(0,0,08)	Down	S07F0_1(4,2,04)->FPC06FE0TQ0(15)	Down
FPC06FE1TQ1(15)->S07F0_1(0,1,08)	Down	S07F0_1(4,3,04)->FPC06FE1TQ1(15)	Down
FPC08FE0TQ0(15)->S07F0_1(0,2,08)	OK	S07F0_1(4,4,04)->FPC08FE0TQ0(15)	OK
FPC08FE1TQ1(15)->S07F0_1(0,3,08)	OK	S07F0_1(4,5,04)->FPC08FE1TQ1(15)	OK
FPC10FE0TQ0(15)->S07F0_1(1,2,09)	Down	S07F0_1(5,0,05)->FPC10FE0TQ0(15)	Down
FPC10FE1TQ1(15)->S07F0_1(1,3,09)	Down	S07F0_1(5,1,05)->FPC10FE1TQ1(15)	Down
FPC12FE0TQ0(15)->S07F0_1(2,2,10)	OK	S07F0_1(6,2,06)->FPC12FE0TQ0(15)	OK
FPC12FE1TQ1(15)->S07F0_1(2,3,10)	OK	S07F0_1(6,3,06)->FPC12FE1TQ1(15)	OK
FPC14FE0TQ0(15)->S07F0_1(3,2,11)	Down	S07F0_1(7,2,07)->FPC14FE0TQ0(15)	Down
FPC14FE1TQ1(15)->S07F0_1(3,3,11)	Down	S07F0_1(7,3,07)->FPC14FE1TQ1(15)	Down

SIB 8 FCHIP 0 FCORE 0 :

In-links	State	Out-links	State
FPC00FE0TQ0(16)->S08F0_0(7,0,07)	Down	S08F0_0(3,0,11)->FPC00FE0TQ0(16)	Down
FPC00FE1TQ1(16)->S08F0_0(7,1,07)	Down	S08F0_0(3,1,11)->FPC00FE1TQ1(16)	Down
FPC02FE0TQ0(16)->S08F0_0(6,0,06)	Down	S08F0_0(2,0,10)->FPC02FE0TQ0(16)	Down
FPC02FE1TQ1(16)->S08F0_0(6,1,06)	Down	S08F0_0(2,1,10)->FPC02FE1TQ1(16)	Down
FPC04FE0TQ0(16)->S08F0_0(5,0,05)	Down	S08F0_0(1,0,09)->FPC04FE0TQ0(16)	Down
FPC04FE1TQ1(16)->S08F0_0(5,1,05)	Down	S08F0_0(1,1,09)->FPC04FE1TQ1(16)	Down
FPC06FE0TQ0(16)->S08F0_0(4,0,04)	Down	S08F0_0(0,0,08)->FPC06FE0TQ0(16)	Down
FPC06FE1TQ1(16)->S08F0_0(4,1,04)	Down	S08F0_0(0,1,08)->FPC06FE1TQ1(16)	Down
FPC08FE0TQ0(16)->S08F0_0(4,2,04)	OK	S08F0_0(0,2,08)->FPC08FE0TQ0(16)	OK

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FPC08FE1TQ1(16)->S08F0_0(4,3,04) OK      S08F0_0(0,3,08)->FPC08FE1TQ1(16) OK
FPC10FE0TQ0(16)->S08F0_0(5,2,05) Down    S08F0_0(1,2,09)->FPC10FE0TQ0(16) Down
FPC10FE1TQ1(16)->S08F0_0(5,3,05) Down    S08F0_0(1,3,09)->FPC10FE1TQ1(16) Down
FPC12FE0TQ0(16)->S08F0_0(7,2,07) OK      S08F0_0(3,2,11)->FPC12FE0TQ0(16) OK
FPC12FE1TQ1(16)->S08F0_0(7,3,07) OK      S08F0_0(3,3,11)->FPC12FE1TQ1(16) OK
FPC14FE0TQ0(16)->S08F0_0(7,4,07) Down    S08F0_0(3,4,11)->FPC14FE0TQ0(16) Down
FPC14FE1TQ1(16)->S08F0_0(7,5,07) Down    S08F0_0(3,5,11)->FPC14FE1TQ1(16) Down

```

SIB 8 FCHIP 0 FCORE 1 :

In-links	State	Out-links	State
FPC00FE0TQ0(17)->S08F0_1(3,0,11)	Down	S08F0_1(7,0,07)->FPC00FE0TQ0(17)	Down
FPC00FE1TQ1(17)->S08F0_1(3,1,11)	Down	S08F0_1(7,1,07)->FPC00FE1TQ1(17)	Down
FPC02FE0TQ0(17)->S08F0_1(2,0,10)	Down	S08F0_1(6,0,06)->FPC02FE0TQ0(17)	Down
FPC02FE1TQ1(17)->S08F0_1(2,1,10)	Down	S08F0_1(6,1,06)->FPC02FE1TQ1(17)	Down
FPC04FE0TQ0(17)->S08F0_1(1,0,09)	Down	S08F0_1(4,0,04)->FPC04FE0TQ0(17)	Down
FPC04FE1TQ1(17)->S08F0_1(1,1,09)	Down	S08F0_1(4,1,04)->FPC04FE1TQ1(17)	Down
FPC06FE0TQ0(17)->S08F0_1(0,0,08)	Down	S08F0_1(4,2,04)->FPC06FE0TQ0(17)	Down
FPC06FE1TQ1(17)->S08F0_1(0,1,08)	Down	S08F0_1(4,3,04)->FPC06FE1TQ1(17)	Down
FPC08FE0TQ0(17)->S08F0_1(0,2,08)	OK	S08F0_1(4,4,04)->FPC08FE0TQ0(17)	OK
FPC08FE1TQ1(17)->S08F0_1(0,3,08)	OK	S08F0_1(4,5,04)->FPC08FE1TQ1(17)	OK
FPC10FE0TQ0(17)->S08F0_1(1,2,09)	Down	S08F0_1(5,0,05)->FPC10FE0TQ0(17)	Down
FPC10FE1TQ1(17)->S08F0_1(1,3,09)	Down	S08F0_1(5,1,05)->FPC10FE1TQ1(17)	Down
FPC12FE0TQ0(17)->S08F0_1(2,2,10)	OK	S08F0_1(6,2,06)->FPC12FE0TQ0(17)	OK
FPC12FE1TQ1(17)->S08F0_1(2,3,10)	OK	S08F0_1(6,3,06)->FPC12FE1TQ1(17)	OK
FPC14FE0TQ0(17)->S08F0_1(3,2,11)	Down	S08F0_1(7,2,07)->FPC14FE0TQ0(17)	Down
FPC14FE1TQ1(17)->S08F0_1(3,3,11)	Down	S08F0_1(7,3,07)->FPC14FE1TQ1(17)	Down

### show chassis fabric topology (PTX10008 Router)

user@host> show chassis fabric topology

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In-link  : FPC# FE# ASIC# (TX inst#, TX sub-chnl #) ->
           SIB# ASIC#_FCORE# (RX port#, RX sub-chnl #, RX inst#)

Out-link  : SIB# ASIC#_FCORE# (TX port#, TX sub-chnl #, TX inst#) ->
           FPC# FE# ASIC# (RX inst#, RX sub-chnl #)

```

SIB 0 FCHIP 0 FCORE 0 :

In-links	State	Out-links	State
FPC00FE0(1,17)->S00F0_0(01,0,01)	OK	S00F0_0(00,0,00)->FPC00FE0(1,09)	OK
FPC00FE0(1,09)->S00F0_0(02,0,02)	OK	S00F0_0(00,1,00)->FPC00FE0(1,17)	OK
FPC00FE0(1,07)->S00F0_0(02,2,02)	OK	S00F0_0(00,2,00)->FPC00FE0(1,07)	OK
FPC00FE1(1,12)->S00F0_0(01,1,01)	OK	S00F0_0(00,3,00)->FPC00FE1(1,06)	OK
FPC00FE1(1,06)->S00F0_0(01,2,01)	OK	S00F0_0(01,1,01)->FPC00FE1(1,12)	OK
FPC00FE1(1,10)->S00F0_0(01,3,01)	OK	S00F0_0(01,3,01)->FPC00FE1(1,10)	OK
FPC00FE2(1,16)->S00F0_0(00,4,00)	OK	S00F0_0(00,4,00)->FPC00FE2(1,08)	OK
FPC00FE2(1,08)->S00F0_0(01,6,01)	OK	S00F0_0(00,5,00)->FPC00FE2(1,16)	OK
FPC00FE2(1,06)->S00F0_0(01,7,01)	OK	S00F0_0(00,6,00)->FPC00FE2(1,06)	OK
FPC05FE0(1,07)->S00F0_0(05,5,05)	OK	S00F0_0(05,2,05)->FPC05FE0(1,17)	OK
FPC05FE0(1,09)->S00F0_0(05,7,05)	OK	S00F0_0(06,4,06)->FPC05FE0(1,07)	OK
FPC05FE0(1,17)->S00F0_0(09,3,09)	OK	S00F0_0(06,7,06)->FPC05FE0(1,09)	OK
FPC05FE1(1,06)->S00F0_0(06,1,06)	OK	S00F0_0(06,0,06)->FPC05FE1(1,06)	OK
FPC05FE1(1,08)->S00F0_0(06,3,06)	OK	S00F0_0(06,2,06)->FPC05FE1(1,08)	OK
FPC05FE1(1,16)->S00F0_0(09,7,09)	OK	S00F0_0(09,6,09)->FPC05FE1(1,16)	OK
FPC05FE2(1,10)->S00F0_0(09,0,09)	OK	S00F0_0(05,0,05)->FPC05FE2(1,06)	OK
FPC05FE2(1,06)->S00F0_0(09,1,09)	OK	S00F0_0(05,1,05)->FPC05FE2(1,10)	OK
FPC05FE2(1,12)->S00F0_0(09,2,09)	OK	S00F0_0(05,3,05)->FPC05FE2(1,12)	OK

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FPC05FE3(1,11)->S00F0_0(09,4,09) OK      S00F0_0(09,4,09)->FPC05FE3(1,07) OK
FPC05FE3(1,07)->S00F0_0(09,5,09) OK      S00F0_0(09,5,09)->FPC05FE3(1,11) OK
FPC05FE3(1,13)->S00F0_0(09,6,09) OK      S00F0_0(09,7,09)->FPC05FE3(1,13) OK
FPC05FE4(1,16)->S00F0_0(05,3,05) OK      S00F0_0(05,4,05)->FPC05FE4(1,06) OK
FPC05FE4(1,06)->S00F0_0(06,5,06) OK      S00F0_0(05,6,05)->FPC05FE4(1,08) OK
FPC05FE4(1,08)->S00F0_0(06,7,06) OK      S00F0_0(09,2,09)->FPC05FE4(1,16) OK
FPC05FE5(1,10)->S00F0_0(05,0,05) OK      S00F0_0(09,0,09)->FPC05FE5(1,06) OK
FPC05FE5(1,06)->S00F0_0(05,1,05) OK      S00F0_0(09,1,09)->FPC05FE5(1,10) OK
FPC05FE5(1,12)->S00F0_0(05,2,05) OK      S00F0_0(09,3,09)->FPC05FE5(1,12) OK
FPC06FE0(1,17)->S00F0_0(05,6,05) OK      S00F0_0(06,6,06)->FPC06FE0(1,17) OK
FPC06FE0(1,07)->S00F0_0(07,0,07) OK      S00F0_0(08,0,08)->FPC06FE0(1,07) OK
FPC06FE0(1,09)->S00F0_0(07,2,07) OK      S00F0_0(08,2,08)->FPC06FE0(1,09) OK
FPC06FE1(1,16)->S00F0_0(06,2,06) OK      S00F0_0(06,3,06)->FPC06FE1(1,16) OK
FPC06FE1(1,06)->S00F0_0(07,4,07) OK      S00F0_0(07,4,07)->FPC06FE1(1,06) OK
FPC06FE1(1,08)->S00F0_0(07,6,07) OK      S00F0_0(07,6,07)->FPC06FE1(1,08) OK
FPC06FE2(1,06)->S00F0_0(05,4,05) OK      S00F0_0(06,5,06)->FPC06FE2(1,06) OK
FPC06FE2(1,10)->S00F0_0(07,1,07) OK      S00F0_0(08,1,08)->FPC06FE2(1,10) OK
FPC06FE2(1,12)->S00F0_0(07,3,07) OK      S00F0_0(08,3,08)->FPC06FE2(1,12) OK
FPC06FE3(1,07)->S00F0_0(06,0,06) OK      S00F0_0(06,1,06)->FPC06FE3(1,07) OK
FPC06FE3(1,11)->S00F0_0(07,5,07) OK      S00F0_0(07,5,07)->FPC06FE3(1,11) OK
FPC06FE3(1,13)->S00F0_0(07,7,07) OK      S00F0_0(07,7,07)->FPC06FE3(1,13) OK
FPC06FE4(1,16)->S00F0_0(06,6,06) OK      S00F0_0(05,7,05)->FPC06FE4(1,16) OK
FPC06FE4(1,06)->S00F0_0(08,0,08) OK      S00F0_0(07,0,07)->FPC06FE4(1,06) OK
FPC06FE4(1,08)->S00F0_0(08,2,08) OK      S00F0_0(07,2,07)->FPC06FE4(1,08) OK
FPC06FE5(1,06)->S00F0_0(06,4,06) OK      S00F0_0(05,5,05)->FPC06FE5(1,06) OK
FPC06FE5(1,10)->S00F0_0(08,1,08) OK      S00F0_0(07,1,07)->FPC06FE5(1,10) OK
FPC06FE5(1,12)->S00F0_0(08,3,08) OK      S00F0_0(07,3,07)->FPC06FE5(1,12) OK

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SIB 0 FCHIP 1 FCORE 0 :

In-links	State	Out-links	State
FPC00FE0(1,15)->S00F1_0(15,4,15)	OK	S00F1_0(16,4,16)->FPC00FE0(1,15)	OK
FPC00FE0(1,11)->S00F1_0(17,4,17)	OK	S00F1_0(18,4,18)->FPC00FE0(1,11)	OK
FPC00FE0(1,13)->S00F1_0(17,6,17)	OK	S00F1_0(18,6,18)->FPC00FE0(1,13)	OK
FPC00FE1(1,08)->S00F1_0(15,6,15)	OK	S00F1_0(16,6,16)->FPC00FE1(1,08)	OK
FPC00FE1(1,14)->S00F1_0(17,5,17)	OK	S00F1_0(18,5,18)->FPC00FE1(1,14)	OK
FPC00FE1(1,16)->S00F1_0(17,7,17)	OK	S00F1_0(18,7,18)->FPC00FE1(1,16)	OK
FPC00FE2(1,14)->S00F1_0(16,0,16)	OK	S00F1_0(16,0,16)->FPC00FE2(1,14)	OK
FPC00FE2(1,10)->S00F1_0(18,0,18)	OK	S00F1_0(18,0,18)->FPC00FE2(1,10)	OK
FPC00FE2(1,12)->S00F1_0(18,2,18)	OK	S00F1_0(18,2,18)->FPC00FE2(1,12)	OK
FPC05FE0(1,11)->S00F1_0(02,0,02)	OK	S00F1_0(02,1,02)->FPC05FE0(1,11)	OK
FPC05FE0(1,13)->S00F1_0(02,2,02)	OK	S00F1_0(02,3,02)->FPC05FE0(1,13)	OK
FPC05FE0(1,15)->S00F1_0(04,7,04)	OK	S00F1_0(03,6,03)->FPC05FE0(1,15)	OK
FPC05FE1(1,10)->S00F1_0(02,4,02)	OK	S00F1_0(02,5,02)->FPC05FE1(1,10)	OK
FPC05FE1(1,12)->S00F1_0(02,6,02)	OK	S00F1_0(02,7,02)->FPC05FE1(1,12)	OK
FPC05FE1(1,14)->S00F1_0(04,3,04)	OK	S00F1_0(04,2,04)->FPC05FE1(1,14)	OK
FPC05FE2(1,16)->S00F1_0(04,4,04)	OK	S00F1_0(03,4,03)->FPC05FE2(1,16)	OK
FPC05FE2(1,08)->S00F1_0(04,5,04)	OK	S00F1_0(03,5,03)->FPC05FE2(1,08)	OK
FPC05FE2(1,14)->S00F1_0(04,6,04)	OK	S00F1_0(03,7,03)->FPC05FE2(1,14)	OK
FPC05FE3(1,17)->S00F1_0(04,0,04)	OK	S00F1_0(04,0,04)->FPC05FE3(1,17)	OK
FPC05FE3(1,09)->S00F1_0(04,1,04)	OK	S00F1_0(04,1,04)->FPC05FE3(1,09)	OK
FPC05FE3(1,15)->S00F1_0(04,2,04)	OK	S00F1_0(04,3,04)->FPC05FE3(1,15)	OK
FPC05FE4(1,10)->S00F1_0(03,0,03)	OK	S00F1_0(03,1,03)->FPC05FE4(1,10)	OK
FPC05FE4(1,12)->S00F1_0(03,2,03)	OK	S00F1_0(03,3,03)->FPC05FE4(1,12)	OK
FPC05FE4(1,14)->S00F1_0(03,7,03)	OK	S00F1_0(04,6,04)->FPC05FE4(1,14)	OK
FPC05FE5(1,16)->S00F1_0(03,4,03)	OK	S00F1_0(04,4,04)->FPC05FE5(1,16)	OK
FPC05FE5(1,08)->S00F1_0(03,5,03)	OK	S00F1_0(04,5,04)->FPC05FE5(1,08)	OK
FPC05FE5(1,14)->S00F1_0(03,6,03)	OK	S00F1_0(04,7,04)->FPC05FE5(1,14)	OK
FPC06FE0(1,15)->S00F1_0(01,0,01)	OK	S00F1_0(00,3,00)->FPC06FE0(1,15)	OK

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FPC06FE0(1,11)->S00F1_0(02,1,02) OK      S00F1_0(01,0,01)->FPC06FE0(1,13) OK
FPC06FE0(1,13)->S00F1_0(02,3,02) OK      S00F1_0(01,2,01)->FPC06FE0(1,11) OK
FPC06FE1(1,14)->S00F1_0(01,4,01) OK      S00F1_0(00,7,00)->FPC06FE1(1,14) OK
FPC06FE1(1,10)->S00F1_0(02,5,02) OK      S00F1_0(01,4,01)->FPC06FE1(1,12) OK
FPC06FE1(1,12)->S00F1_0(02,7,02) OK      S00F1_0(01,6,01)->FPC06FE1(1,10) OK
FPC06FE2(1,08)->S00F1_0(01,2,01) OK      S00F1_0(00,1,00)->FPC06FE2(1,08) OK
FPC06FE2(1,16)->S00F1_0(15,0,15) OK      S00F1_0(01,5,01)->FPC06FE2(1,16) OK
FPC06FE2(1,14)->S00F1_0(15,2,15) OK      S00F1_0(01,7,01)->FPC06FE2(1,14) OK
FPC06FE3(1,09)->S00F1_0(01,6,01) OK      S00F1_0(00,5,00)->FPC06FE3(1,09) OK
FPC06FE3(1,17)->S00F1_0(19,4,19) OK      S00F1_0(02,4,02)->FPC06FE3(1,17) OK
FPC06FE3(1,15)->S00F1_0(19,6,19) OK      S00F1_0(02,6,02)->FPC06FE3(1,15) OK
FPC06FE4(1,14)->S00F1_0(01,7,01) OK      S00F1_0(01,3,01)->FPC06FE4(1,14) OK
FPC06FE4(1,10)->S00F1_0(03,1,03) OK      S00F1_0(02,0,02)->FPC06FE4(1,12) OK
FPC06FE4(1,12)->S00F1_0(03,3,03) OK      S00F1_0(02,2,02)->FPC06FE4(1,10) OK
FPC06FE5(1,08)->S00F1_0(01,5,01) OK      S00F1_0(01,1,01)->FPC06FE5(1,08) OK
FPC06FE5(1,16)->S00F1_0(19,0,19) OK      S00F1_0(03,0,03)->FPC06FE5(1,16) OK
FPC06FE5(1,14)->S00F1_0(19,2,19) OK      S00F1_0(03,2,03)->FPC06FE5(1,14) OK

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SIB 1 FCHIP 0 FCORE 0 :

In-links	State	Out-links	State
FPC00FE0(1,05)->S01F0_0(01,0,01)	OK	S01F0_0(00,0,00)->FPC00FE0(0,01)	OK
FPC00FE0(0,01)->S01F0_0(02,0,02)	OK	S01F0_0(00,1,00)->FPC00FE0(1,05)	OK
FPC00FE0(0,07)->S01F0_0(02,2,02)	OK	S01F0_0(00,2,00)->FPC00FE0(0,07)	OK
FPC00FE1(1,04)->S01F0_0(00,4,00)	OK	S01F0_0(00,4,00)->FPC00FE1(0,00)	OK
FPC00FE1(0,00)->S01F0_0(01,6,01)	OK	S01F0_0(00,5,00)->FPC00FE1(1,04)	OK
FPC00FE1(0,06)->S01F0_0(01,7,01)	OK	S01F0_0(00,6,00)->FPC00FE1(0,06)	OK
FPC00FE2(1,01)->S01F0_0(01,1,01)	OK	S01F0_0(00,3,00)->FPC00FE2(0,06)	OK
FPC00FE2(0,06)->S01F0_0(01,2,01)	OK	S01F0_0(01,1,01)->FPC00FE2(1,01)	OK
FPC00FE2(1,00)->S01F0_0(01,3,01)	OK	S01F0_0(01,3,01)->FPC00FE2(1,00)	OK
FPC05FE0(0,07)->S01F0_0(05,5,05)	OK	S01F0_0(05,2,05)->FPC05FE0(1,05)	OK
FPC05FE0(0,01)->S01F0_0(05,7,05)	OK	S01F0_0(06,4,06)->FPC05FE0(0,07)	OK
FPC05FE0(1,05)->S01F0_0(09,3,09)	OK	S01F0_0(06,7,06)->FPC05FE0(0,01)	OK
FPC05FE1(1,00)->S01F0_0(09,0,09)	OK	S01F0_0(05,0,05)->FPC05FE1(0,06)	OK
FPC05FE1(0,06)->S01F0_0(09,1,09)	OK	S01F0_0(05,1,05)->FPC05FE1(1,00)	OK
FPC05FE1(1,01)->S01F0_0(09,2,09)	OK	S01F0_0(05,3,05)->FPC05FE1(1,01)	OK
FPC05FE2(0,06)->S01F0_0(06,1,06)	OK	S01F0_0(06,0,06)->FPC05FE2(0,06)	OK
FPC05FE2(0,00)->S01F0_0(06,3,06)	OK	S01F0_0(06,2,06)->FPC05FE2(0,00)	OK
FPC05FE2(1,04)->S01F0_0(09,7,09)	OK	S01F0_0(09,6,09)->FPC05FE2(1,04)	OK
FPC05FE3(1,00)->S01F0_0(09,4,09)	OK	S01F0_0(09,4,09)->FPC05FE3(0,06)	OK
FPC05FE3(0,06)->S01F0_0(09,5,09)	OK	S01F0_0(09,5,09)->FPC05FE3(1,00)	OK
FPC05FE3(1,01)->S01F0_0(09,6,09)	OK	S01F0_0(09,7,09)->FPC05FE3(1,01)	OK
FPC05FE4(0,04)->S01F0_0(05,3,05)	OK	S01F0_0(05,4,05)->FPC05FE4(0,14)	OK
FPC05FE4(0,14)->S01F0_0(06,5,06)	OK	S01F0_0(05,6,05)->FPC05FE4(0,16)	OK
FPC05FE4(0,16)->S01F0_0(06,7,06)	OK	S01F0_0(09,2,09)->FPC05FE4(0,04)	OK
FPC05FE5(1,00)->S01F0_0(05,0,05)	OK	S01F0_0(09,0,09)->FPC05FE5(0,06)	OK
FPC05FE5(0,06)->S01F0_0(05,1,05)	OK	S01F0_0(09,1,09)->FPC05FE5(1,00)	OK
FPC05FE5(1,01)->S01F0_0(05,2,05)	OK	S01F0_0(09,3,09)->FPC05FE5(1,01)	OK
FPC06FE0(1,05)->S01F0_0(05,6,05)	OK	S01F0_0(06,6,06)->FPC06FE0(1,05)	OK
FPC06FE0(0,07)->S01F0_0(07,0,07)	OK	S01F0_0(08,0,08)->FPC06FE0(0,07)	OK
FPC06FE0(0,01)->S01F0_0(07,2,07)	OK	S01F0_0(08,2,08)->FPC06FE0(0,01)	OK
FPC06FE1(0,06)->S01F0_0(05,4,05)	OK	S01F0_0(06,5,06)->FPC06FE1(0,06)	OK
FPC06FE1(1,00)->S01F0_0(07,1,07)	OK	S01F0_0(08,1,08)->FPC06FE1(1,00)	OK
FPC06FE1(1,01)->S01F0_0(07,3,07)	OK	S01F0_0(08,3,08)->FPC06FE1(1,01)	OK
FPC06FE2(1,04)->S01F0_0(06,2,06)	OK	S01F0_0(06,3,06)->FPC06FE2(1,04)	OK
FPC06FE2(0,06)->S01F0_0(07,4,07)	OK	S01F0_0(07,4,07)->FPC06FE2(0,06)	OK
FPC06FE2(0,00)->S01F0_0(07,6,07)	OK	S01F0_0(07,6,07)->FPC06FE2(0,00)	OK
FPC06FE3(0,06)->S01F0_0(06,0,06)	OK	S01F0_0(06,1,06)->FPC06FE3(0,06)	OK
FPC06FE3(1,00)->S01F0_0(07,5,07)	OK	S01F0_0(07,5,07)->FPC06FE3(1,00)	OK

```

FPC06FE3(1,01)->S01F0_0(07,7,07) OK      S01F0_0(07,7,07)->FPC06FE3(1,01) OK
FPC06FE4(0,04)->S01F0_0(06,6,06) OK      S01F0_0(05,7,05)->FPC06FE4(0,04) OK
FPC06FE4(0,14)->S01F0_0(08,0,08) OK      S01F0_0(07,0,07)->FPC06FE4(0,14) OK
FPC06FE4(0,16)->S01F0_0(08,2,08) OK      S01F0_0(07,2,07)->FPC06FE4(0,16) OK
FPC06FE5(0,06)->S01F0_0(06,4,06) OK      S01F0_0(05,5,05)->FPC06FE5(0,06) OK
FPC06FE5(1,00)->S01F0_0(08,1,08) OK      S01F0_0(07,1,07)->FPC06FE5(1,00) OK
FPC06FE5(1,01)->S01F0_0(08,3,08) OK      S01F0_0(07,3,07)->FPC06FE5(1,01) OK

```

SIB 1 FCHIP 1 FCORE 0 :

In-links	State	Out-links	State
FPC00FE0(1,03)->S01F1_0(15,4,15)	OK	S01F1_0(16,4,16)->FPC00FE0(1,03)	OK
FPC00FE0(0,02)->S01F1_0(17,4,17)	OK	S01F1_0(18,4,18)->FPC00FE0(0,02)	OK
FPC00FE0(0,03)->S01F1_0(17,6,17)	OK	S01F1_0(18,6,18)->FPC00FE0(0,03)	OK
FPC00FE1(1,02)->S01F1_0(16,0,16)	OK	S01F1_0(16,0,16)->FPC00FE1(1,02)	OK
FPC00FE1(1,00)->S01F1_0(18,0,18)	OK	S01F1_0(18,0,18)->FPC00FE1(1,00)	OK
FPC00FE1(1,01)->S01F1_0(18,2,18)	OK	S01F1_0(18,2,18)->FPC00FE1(1,01)	OK
FPC00FE2(0,00)->S01F1_0(15,6,15)	OK	S01F1_0(16,6,16)->FPC00FE2(0,00)	OK
FPC00FE2(1,02)->S01F1_0(17,5,17)	OK	S01F1_0(18,5,18)->FPC00FE2(1,02)	OK
FPC00FE2(1,04)->S01F1_0(17,7,17)	OK	S01F1_0(18,7,18)->FPC00FE2(1,04)	OK
FPC05FE0(0,02)->S01F1_0(02,0,02)	OK	S01F1_0(02,1,02)->FPC05FE0(0,03)	OK
FPC05FE0(0,03)->S01F1_0(02,2,02)	OK	S01F1_0(02,3,02)->FPC05FE0(0,02)	OK
FPC05FE0(1,03)->S01F1_0(04,7,04)	OK	S01F1_0(03,6,03)->FPC05FE0(1,03)	OK
FPC05FE1(1,04)->S01F1_0(04,4,04)	OK	S01F1_0(03,4,03)->FPC05FE1(0,00)	OK
FPC05FE1(0,00)->S01F1_0(04,5,04)	OK	S01F1_0(03,5,03)->FPC05FE1(1,04)	OK
FPC05FE1(1,02)->S01F1_0(04,6,04)	OK	S01F1_0(03,7,03)->FPC05FE1(1,02)	OK
FPC05FE2(1,00)->S01F1_0(02,4,02)	OK	S01F1_0(02,5,02)->FPC05FE2(1,01)	OK
FPC05FE2(1,01)->S01F1_0(02,6,02)	OK	S01F1_0(02,7,02)->FPC05FE2(1,00)	OK
FPC05FE2(1,02)->S01F1_0(04,3,04)	OK	S01F1_0(04,2,04)->FPC05FE2(1,02)	OK
FPC05FE3(1,04)->S01F1_0(04,0,04)	OK	S01F1_0(04,0,04)->FPC05FE3(0,00)	OK
FPC05FE3(0,00)->S01F1_0(04,1,04)	OK	S01F1_0(04,1,04)->FPC05FE3(1,04)	OK
FPC05FE3(1,02)->S01F1_0(04,2,04)	OK	S01F1_0(04,3,04)->FPC05FE3(1,02)	OK
FPC05FE4(0,10)->S01F1_0(03,0,03)	OK	S01F1_0(03,1,03)->FPC05FE4(0,12)	OK
FPC05FE4(0,12)->S01F1_0(03,2,03)	OK	S01F1_0(03,3,03)->FPC05FE4(0,10)	OK
FPC05FE4(0,08)->S01F1_0(03,7,03)	OK	S01F1_0(04,6,04)->FPC05FE4(0,08)	OK
FPC05FE5(1,04)->S01F1_0(03,4,03)	OK	S01F1_0(04,4,04)->FPC05FE5(0,00)	OK
FPC05FE5(0,00)->S01F1_0(03,5,03)	OK	S01F1_0(04,5,04)->FPC05FE5(1,04)	OK
FPC05FE5(1,02)->S01F1_0(03,6,03)	OK	S01F1_0(04,7,04)->FPC05FE5(1,02)	OK
FPC06FE0(1,03)->S01F1_0(01,0,01)	OK	S01F1_0(00,3,00)->FPC06FE0(1,03)	OK
FPC06FE0(0,02)->S01F1_0(02,1,02)	OK	S01F1_0(01,0,01)->FPC06FE0(0,03)	OK
FPC06FE0(0,03)->S01F1_0(02,3,02)	OK	S01F1_0(01,2,01)->FPC06FE0(0,02)	OK
FPC06FE1(0,00)->S01F1_0(01,2,01)	OK	S01F1_0(00,1,00)->FPC06FE1(0,00)	OK
FPC06FE1(1,04)->S01F1_0(15,0,15)	OK	S01F1_0(01,5,01)->FPC06FE1(1,04)	OK
FPC06FE1(1,02)->S01F1_0(15,2,15)	OK	S01F1_0(01,7,01)->FPC06FE1(1,02)	OK
FPC06FE2(1,02)->S01F1_0(01,4,01)	OK	S01F1_0(00,7,00)->FPC06FE2(1,02)	OK
FPC06FE2(1,00)->S01F1_0(02,5,02)	OK	S01F1_0(01,4,01)->FPC06FE2(1,01)	OK
FPC06FE2(1,01)->S01F1_0(02,7,02)	OK	S01F1_0(01,6,01)->FPC06FE2(1,00)	OK
FPC06FE3(0,00)->S01F1_0(01,6,01)	OK	S01F1_0(00,5,00)->FPC06FE3(0,00)	OK
FPC06FE3(1,04)->S01F1_0(19,4,19)	OK	S01F1_0(02,4,02)->FPC06FE3(1,04)	OK
FPC06FE3(1,02)->S01F1_0(19,6,19)	OK	S01F1_0(02,6,02)->FPC06FE3(1,02)	OK
FPC06FE4(0,08)->S01F1_0(01,7,01)	OK	S01F1_0(01,3,01)->FPC06FE4(0,08)	OK
FPC06FE4(0,10)->S01F1_0(03,1,03)	OK	S01F1_0(02,0,02)->FPC06FE4(0,12)	OK
FPC06FE4(0,12)->S01F1_0(03,3,03)	OK	S01F1_0(02,2,02)->FPC06FE4(0,10)	OK
FPC06FE5(0,00)->S01F1_0(01,5,01)	OK	S01F1_0(01,1,01)->FPC06FE5(0,00)	OK
FPC06FE5(1,04)->S01F1_0(19,0,19)	OK	S01F1_0(03,0,03)->FPC06FE5(1,04)	OK
FPC06FE5(1,02)->S01F1_0(19,2,19)	OK	S01F1_0(03,2,03)->FPC06FE5(1,02)	OK

SIB 2

Not Online

SIB 3  
Not Online

SIB 4  
Not Online

SIB 5  
Not Online

### show chassis fabric topology (QFX10008 Switch)

user@host> show chassis fabric topology

In-link : FPC# FE# ASIC# (TX inst#, TX sub-chnl #) ->  
SIB# ASIC#\_FCORE# (RX port#, RX sub-chnl #, RX inst#)

Out-link : SIB# ASIC#\_FCORE# (TX port#, TX sub-chnl #, TX inst#) ->  
FPC# FE# ASIC# (RX inst#, RX sub-chnl #)

SIB 0 FCHIP 0 FCORE 0 :

In-links	State	Out-links	State
FPC00FE0(1,17)->S00F0_0(01,0,01)	OK	S00F0_0(00,0,00)->FPC00FE0(1,09)	OK
FPC00FE0(1,09)->S00F0_0(02,0,02)	OK	S00F0_0(00,1,00)->FPC00FE0(1,17)	OK
FPC00FE0(1,07)->S00F0_0(02,2,02)	OK	S00F0_0(00,2,00)->FPC00FE0(1,07)	OK
FPC00FE1(1,12)->S00F0_0(01,1,01)	OK	S00F0_0(00,3,00)->FPC00FE1(1,06)	OK
FPC00FE1(1,06)->S00F0_0(01,2,01)	OK	S00F0_0(01,1,01)->FPC00FE1(1,12)	OK
FPC00FE1(1,10)->S00F0_0(01,3,01)	OK	S00F0_0(01,3,01)->FPC00FE1(1,10)	OK
FPC00FE2(1,16)->S00F0_0(00,4,00)	OK	S00F0_0(00,4,00)->FPC00FE2(1,08)	OK
FPC00FE2(1,08)->S00F0_0(01,6,01)	OK	S00F0_0(00,5,00)->FPC00FE2(1,16)	OK
FPC00FE2(1,06)->S00F0_0(01,7,01)	OK	S00F0_0(00,6,00)->FPC00FE2(1,06)	OK

SIB 0 FCHIP 1 FCORE 0 :

In-links	State	Out-links	State
FPC00FE0(1,15)->S00F1_0(15,4,15)	OK	S00F1_0(16,4,16)->FPC00FE0(1,15)	OK
FPC00FE0(1,11)->S00F1_0(17,4,17)	OK	S00F1_0(18,4,18)->FPC00FE0(1,11)	OK
FPC00FE0(1,13)->S00F1_0(17,6,17)	OK	S00F1_0(18,6,18)->FPC00FE0(1,13)	OK
FPC00FE1(1,08)->S00F1_0(15,6,15)	OK	S00F1_0(16,6,16)->FPC00FE1(1,08)	OK
FPC00FE1(1,14)->S00F1_0(17,5,17)	OK	S00F1_0(18,5,18)->FPC00FE1(1,14)	OK
FPC00FE1(1,16)->S00F1_0(17,7,17)	OK	S00F1_0(18,7,18)->FPC00FE1(1,16)	OK
FPC00FE2(1,14)->S00F1_0(16,0,16)	OK	S00F1_0(16,0,16)->FPC00FE2(1,14)	OK
FPC00FE2(1,10)->S00F1_0(18,0,18)	OK	S00F1_0(18,0,18)->FPC00FE2(1,10)	OK
FPC00FE2(1,12)->S00F1_0(18,2,18)	OK	S00F1_0(18,2,18)->FPC00FE2(1,12)	OK

SIB 1  
Not Online

SIB 2  
Not Online

SIB 3  
Not Online

SIB 4  
Not Online

SIB 5  
Not Online

## show chassis fabric unreachable-destinations

<b>Syntax</b>	<b>show chassis fabric unreachable-destinations</b>
<b>Release Information</b>	<p>Command introduced before Junos OS Release 11.4.</p> <p>Command introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Switches.</p> <p>Command introduced in Junos OS Release 13.1R3 for TX Matrix routers.</p>
<b>Description</b>	(M320 and T Series routers only) Display the list of destinations that have transitioned from a reachable state to an unreachable state.
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><a href="#">show chassis fabric reachability on page 1554</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">show chassis fabric unreachable-destinations(T640 and T1600 routers) on page 1622</a> <a href="#">show chassis fabric unreachable-destinations(TX Matrix routers) on page 1623</a>
<b>Output Fields</b>	The table lists the output fields for the <b>show chassis fabric unreachable-destinations</b> command. Output fields are listed in the approximate order in which they appear.

*Table 134: show chassis fabric unreachable-destinations Output Fields*

Field Name	Field Description
Flexible PIC Concentrator (FPC) number	Source FPC number where unreachable destinations are present.
Packet Forwarding Engine number	Source Packet Forwarding Engine number where unreachable destinations are present.
Destination error on Packet Forwarding Engine	List of destination FPCs <i>FPC number</i> /Packet Forwarding Engines <i>Packet Forwarding Engine number</i> that are not reachable from the source FPCs <i>FPC number</i> /Packet Forwarding Engines <i>Packet Forwarding Engine number</i> over the fabric.

## Sample Output

### show chassis fabric unreachable-destinations(T640 and T1600 routers)

```

user@host> show chassis fabric unreachable-destinations

Fabric management unreachable destinations:
FPC 2
  PFE 0
    Destination error on PFEs      2/0 3/0 3/1 7/0
FPC 3
  PFE 0

```



```

        Destination error on PFEs      2/0 3/0 3/1 7/0
FPC 3
  PFE 1
    Destination error on PFEs      2/0 3/0 3/1 7/0
FPC 7
  PFE 0
    Destination error on PFEs      2/0 3/0 3/1 7/0

```

### show chassis fabric unreachable-destinations(TX Matrix routers)

```

user@host> show chassis fabric unreachable-destinations
Fabric management unreachable destinations:
FPC 10
  PFE 0
    Destination error on PFEs      10/0 16/0 16/1 17/0 17/1 19/0 20/1 21/1 22/1
24/0
    26/0 27/0 27/1 28/1 29/1 31/1
FPC 12
  PFE 0
    Destination error on PFEs      12/0 16/0 16/1 17/0 17/1 19/0 20/1 21/1 22/1
24/0
    26/0 27/0 27/1 28/1 29/1 31/1
FPC 16
  PFE 0
    Destination error on PFEs      10/0 12/0
FPC 16
  PFE 1
    Destination error on PFEs      10/0 12/0
FPC 17
  PFE 0
    Destination error on PFEs      10/0 12/0
FPC 17
  PFE 1
    Destination error on PFEs      10/0 12/0
FPC 19
  PFE 0
    Destination error on PFEs      10/0 12/0
FPC 20
  PFE 1
    Destination error on PFEs      10/0 12/0
FPC 21
  PFE 1
    Destination error on PFEs      10/0 12/0
FPC 22
  PFE 1
    Destination error on PFEs      10/0 12/0
FPC 24
  PFE 0
    Destination error on PFEs      10/0 12/0
FPC 26
  PFE 0
    Destination error on PFEs      10/0 12/0
FPC 27
  PFE 0
    Destination error on PFEs      10/0 12/0
FPC 27
  PFE 1
    Destination error on PFEs      10/0

```

```
FPC 28
  PFE 1
    Destination error on PFES    10/0 12/0
FPC 29
  PFE 1
    Destination error on PFES    10/0 12/0
FPC 31
  PFE 1
    Destination error on PFES    10/0 12/0
```

## show chassis fan

<b>List of Syntax</b>	<a href="#">Syntax on page 1625</a>
	<a href="#">Syntax (ACX4000 Series Router) on page 1625</a>
	<a href="#">Syntax (ACX5048 and ACX5096 Routers) on page 1625</a>
	<a href="#">Syntax (MX Series Routers) on page 1625</a>
	<a href="#">Syntax (T Series Routers) on page 1625</a>
	<a href="#">Syntax (MX104, MX204, MX2010, MX2020, MX2008, and MX10003 Universal Routing Platform) on page 1625</a>
	<a href="#">Syntax (MX10003 Universal Routing Platform) on page 1625</a>
	<a href="#">Syntax (PTX Series) on page 1625</a>
	<a href="#">Syntax (QFX Series) on page 1626</a>
	<a href="#">Syntax (OCX Series) on page 1626</a>
	<a href="#">Syntax (TX Matrix Router) on page 1626</a>
	<a href="#">Syntax (TX Matrix Plus Router) on page 1626</a>
	<a href="#">Syntax (EX9251, EX9253 Switches) on page 1626</a>

<b>Syntax</b>	show chassis fan
<b>Syntax (ACX4000 Series Router)</b>	show chassis fan
<b>Syntax (ACX5048 and ACX5096 Routers)</b>	show chassis fan
<b>Syntax (MX Series Routers)</b>	show chassis fan <all-members> <local> <member <i>member-id</i> >
<b>Syntax (T Series Routers)</b>	show chassis fan
<b>Syntax (MX104, MX204, MX2010, MX2020, MX2008, and MX10003 Universal Routing Platform)</b>	show chassis fan <satellite [slot-id <i>slot-id</i> [device-alias <i>alias-name</i> ]]>
<b>Syntax (MX10003 Universal Routing Platform)</b>	show chassis fan
<b>Syntax (PTX Series)</b>	show chassis fan

Syntax (QFX Series)	show chassis fan <interconnect-device <i>name</i> >
Syntax (OCX Series)	show chassis fan
Syntax (TX Matrix Router)	show chassis fan <lcc <i>number</i>   scc>
Syntax (TX Matrix Plus Router)	show chassis fan <lcc <i>number</i>   sfc <i>number</i> >
Syntax (EX9251, EX9253 Switches)	show chassis fan
Release Information	<p>Command introduced in Junos OS Release 10.0 on MX Series 5G Universal Routing Platforms, M120 routers, and M320 routers, T320 routers, T640 routers, T1600 routers, TX Matrix Routers, and TX Matrix Plus routers.</p> <p>Command introduced in Junos OS Release 11.1 for the QFX Series.</p> <p>Command introduced in Junos OS Release 11.4 for EX Series switches.</p> <p>Command introduced in Junos OS Release 12.1 for T4000 routers.</p> <p>Command introduced in Junos OS Release 12.3 for PTX5000 Packet Transport Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 and MX2020 Universal Routing Platforms, and ACX Series Routers.</p> <p>Command introduced in Junos OS Release 13.2 for MX104 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> <p><b>satellite</b> option introduced in Junos OS Release 14.2R3.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.3 for MX150 Router Appliance.</p> <p>Command introduced in Junos OS Release 17.2 for PTX10008 Routers.</p> <p>Command introduced in Junos OS Release 17.4 for MX204 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 18.1R1 for EX9251 Switches.</p> <p>Command introduced in Junos OS Release 18.2 for EX9253 Switches.</p> <p>Command introduced in Junos OS Release 18.2 for MX10008 Universal Routing Platforms.</p>
Description	<p>(T Series routers, TX Matrix routers, TX Matrix Plus routers, M120 routers, M320 routers, MX104 routers, MX2010 routers, MX2020 routers, MX2008 routers, MX Series 5G Universal Routing Platforms, QFX3008-I Interconnect devices, QFX Series, OCX Series, EX Series switches, and PTX Series Packet Transport Routers only) Show information about the fan tray and fans.</p>
Options	<p><b>all-members</b>—(MX Series routers only) (Optional) Display information about the fan tray and fans for all members of the Virtual Chassis configuration.</p> <p><b>local</b>—(MX Series routers only) (Optional) Display information about the fan tray and fans for the local Virtual Chassis member.</p>

**member *member-id***—(MX Series routers only) (Optional) Display information about the fan tray and fans for the specified member of the Virtual Chassis configuration. For an MX Series Virtual Chassis, replace *member-id* variable with a value 0 or 1.

**interconnect-device *name***—(QFX3000-G QFabric systems only) (Optional) Display information about the fan tray and fans for the specified QFX3008-I Interconnect device.

**lcc *number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display information about the fan tray and fans for the specified T640 router (line-card chassis) that is connected to a TX Matrix router. On a TX Matrix Plus router, display information about the fan tray and fans for the specified router (line-card chassis) that is connected to a TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**satellite [*slot-id slot-id* | device-alias *alias-name*]**—(Junos Fusion only) (Optional) Display information about the fan tray and fans for the specified satellite device or devices in a Junos Fusion, or for all satellite devices if no satellite devices are specified.

**scc**—(TX Matrix routers only) (Optional) Display information about the fan tray and fans for the TX Matrix router (switch-card chassis).

**sfc *number***—(TX Matrix Plus routers only) (Optional) Display information about the fan tray and fans for the TX Matrix Plus router (switch-fabric chassis). Replace *number* variable with 0.

**Required Privilege Level** view

**List of Sample Output**

- [show chassis fan on page 1629](#)
- [show chassis fan \(QFabric Systems\) on page 1629](#)
- [show chassis fan \(EX Series Switches\) on page 1630](#)
- [show chassis fan \(T320 Router\) on page 1631](#)
- [show chassis fan \(T640 Router\) on page 1631](#)
- [show chassis fan \(T1600 Router\) on page 1632](#)
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- [show chassis fan \(TX Matrix Router\) on page 1632](#)
- [show chassis fan \(TX Matrix Plus Router\) on page 1633](#)

[show chassis fan \(TX Matrix Plus Router with 3D SIBs\) on page 1635](#)  
[show chassis fan \(PTX5000 Packet Transport Router\) on page 1637](#)  
[show chassis fan \(PTX10008 Router\) on page 1637](#)  
[show chassis fan \(MX150\) on page 1638](#)  
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[show chassis fan \(QFX5100 Switch and OCX Series\) on page 1641](#)  
[show chassis fan \(EX9251 switches\) on page 1641](#)  
[show chassis fan \(EX9253 switches\) on page 1641](#)

**Output Fields** Table 118 on page 1355 lists the output fields for the **show chassis fan** command. Output fields are listed in the approximate order in which they appear.

*Table 135: show chassis fan Output Fields*

Field Name	Field Description
<b>Item</b>	Fan item identifier.
<b>Status</b>	Status of the fan: <ul style="list-style-type: none"> <li>• <b>OK</b>—Fan is running properly and within the normal range.</li> <li>• <b>Check</b>—Fan is in <b>Check</b> state because of some fault or alarm condition.</li> </ul>
<b>RPM</b>	(T Series routers, TX Matrix routers, TX Matrix Plus routers, MX Series 5G Universal Routing Platforms, QFX3108 Interconnect devices, and EX Series switches only) Fan speed in revolutions per minute (RPM).
<b>% RPM</b>	(MX2010 routers, MX2020 routers, MX2008 routers, and PTX Series Packet Transport Routers only) Percentage of the fan speed being used.
<b>Measurement</b>	(T Series routers, TX Matrix routers, TX Matrix Plus routers, MX Series 5G Universal Routing Platforms, QFX3108 Interconnect devices, and EX Series switches only) Fan speed status based on different chassis cooling requirements: <ul style="list-style-type: none"> <li>• Spinning at high speed</li> <li>• Spinning at intermediate speed</li> <li>• Spinning at normal speed</li> <li>• Spinning at low speed (except EX Series switches)</li> </ul> (MX2010 routers, MX2020 routers, MX2008 routers, and PTX Series Packet Transport Routers only) Fan speed in revolutions per minute (RPM) for each fan in the fan tray.

## Sample Output

### show chassis fan

```
user@host> show chassis fan
```

Item	Status	RPM	Measurement
Top Tray Fan 1	OK	3790	Spinning at normal speed
Top Tray Fan 2	OK	3769	Spinning at normal speed
Top Tray Fan 3	OK	3769	Spinning at normal speed
Top Tray Fan 4	OK	3790	Spinning at normal speed
Top Tray Fan 5	OK	3790	Spinning at normal speed
Top Tray Fan 6	OK	3769	Spinning at normal speed
Top Tray Fan 7	OK	3790	Spinning at normal speed
Top Tray Fan 8	OK	3769	Spinning at normal speed
Top Tray Fan 9	OK	3769	Spinning at normal speed
Top Tray Fan 10	OK	3790	Spinning at normal speed
Top Tray Fan 11	OK	3790	Spinning at normal speed
Top Tray Fan 12	OK	3769	Spinning at normal speed
Bottom Tray Fan 1	OK	2880	Spinning at normal speed
Bottom Tray Fan 2	OK	2912	Spinning at normal speed
Bottom Tray Fan 3	OK	2928	Spinning at normal speed
Bottom Tray Fan 4	OK	2896	Spinning at normal speed
Bottom Tray Fan 5	OK	2896	Spinning at normal speed
Bottom Tray Fan 6	OK	2928	Spinning at normal speed

### show chassis fan (QFabric Systems)

```
user@host> show chassis fan interconnect-device interconnect1
```

Item	Status	RPM	Measurement
TFT 0 Fan 0	OK	2849	Spinning at normal speed
TFT 0 Fan 1	OK	2821	Spinning at normal speed
TFT 0 Fan 2	OK	2735	Spinning at normal speed
TFT 0 Fan 3	OK	2815	Spinning at normal speed
TFT 0 Fan 4	OK	2828	Spinning at normal speed
TFT 0 Fan 5	OK	2863	Spinning at normal speed
BFT 1 Fan 0	OK	2941	Spinning at normal speed
BFT 1 Fan 1	OK	3008	Spinning at normal speed
BFT 1 Fan 2	OK	3073	Spinning at normal speed
BFT 1 Fan 3	OK	2925	Spinning at normal speed
BFT 1 Fan 4	OK	2863	Spinning at normal speed
BFT 1 Fan 5	OK	2933	Spinning at normal speed
SFT 0 Fan 0 Rotor 0	OK	15472	Spinning at normal speed
SFT 0 Fan 0 Rotor 1	OK	14477	Spinning at normal speed
SFT 0 Fan 1 Rotor 0	OK	15561	Spinning at normal speed
SFT 0 Fan 1 Rotor 1	OK	14210	Spinning at normal speed
SFT 0 Fan 2 Rotor 0	OK	16167	Spinning at normal speed
SFT 0 Fan 2 Rotor 1	OK	14248	Spinning at normal speed
SFT 0 Fan 3 Rotor 0	OK	16463	Spinning at normal speed
SFT 0 Fan 3 Rotor 1	OK	14099	Spinning at normal speed
SFT 1 Fan 0 Rotor 0	OK	15083	Spinning at normal speed
SFT 1 Fan 0 Rotor 1	OK	13533	Spinning at normal speed
SFT 1 Fan 1 Rotor 0	OK	16071	Spinning at normal speed
SFT 1 Fan 1 Rotor 1	OK	14400	Spinning at normal speed
SFT 1 Fan 2 Rotor 0	OK	15517	Spinning at normal speed
SFT 1 Fan 2 Rotor 1	OK	14210	Spinning at normal speed
SFT 1 Fan 3 Rotor 0	OK	16413	Spinning at normal speed

SFT 1 Fan 3 Rotor 1	OK	14400	Spinning at normal speed
SFT 2 Fan 0 Rotor 0	OK	15297	Spinning at normal speed
SFT 2 Fan 0 Rotor 1	OK	14634	Spinning at normal speed
SFT 2 Fan 1 Rotor 0	OK	15561	Spinning at normal speed
SFT 2 Fan 1 Rotor 1	OK	14285	Spinning at normal speed
SFT 2 Fan 2 Rotor 0	OK	15835	Spinning at normal speed
SFT 2 Fan 2 Rotor 1	OK	14400	Spinning at normal speed
SFT 2 Fan 3 Rotor 0	OK	15789	Spinning at normal speed
SFT 2 Fan 3 Rotor 1	OK	14323	Spinning at normal speed
SFT 3 Fan 0 Rotor 0	OK	16314	Spinning at normal speed
SFT 3 Fan 0 Rotor 1	OK	14876	Spinning at normal speed
SFT 3 Fan 1 Rotor 0	OK	15835	Spinning at normal speed
SFT 3 Fan 1 Rotor 1	OK	14323	Spinning at normal speed
SFT 3 Fan 2 Rotor 0	OK	16265	Spinning at normal speed
SFT 3 Fan 2 Rotor 1	OK	14594	Spinning at normal speed
SFT 3 Fan 3 Rotor 0	OK	16071	Spinning at normal speed
SFT 3 Fan 3 Rotor 1	OK	14323	Spinning at normal speed
SFT 4 Fan 0 Rotor 0	OK	15652	Spinning at normal speed
SFT 4 Fan 0 Rotor 1	OK	14438	Spinning at normal speed
SFT 4 Fan 1 Rotor 0	OK	16167	Spinning at normal speed
SFT 4 Fan 1 Rotor 1	OK	14555	Spinning at normal speed
SFT 4 Fan 2 Rotor 0	OK	16023	Spinning at normal speed
SFT 4 Fan 2 Rotor 1	OK	14361	Spinning at normal speed
SFT 4 Fan 3 Rotor 0	OK	16216	Spinning at normal speed
SFT 4 Fan 3 Rotor 1	OK	14438	Spinning at normal speed
SFT 5 Fan 0 Rotor 0	OK	15297	Spinning at normal speed
SFT 5 Fan 0 Rotor 1	OK	14173	Spinning at normal speed
SFT 5 Fan 1 Rotor 0	OK	15472	Spinning at normal speed
SFT 5 Fan 1 Rotor 1	OK	13846	Spinning at normal speed
SFT 5 Fan 2 Rotor 0	OK	15340	Spinning at normal speed
SFT 5 Fan 2 Rotor 1	OK	13917	Spinning at normal speed
SFT 5 Fan 3 Rotor 0	OK	15835	Spinning at normal speed
SFT 5 Fan 3 Rotor 1	OK	13917	Spinning at normal speed
SFT 6 Fan 0 Rotor 0	OK	15743	Spinning at normal speed
SFT 6 Fan 0 Rotor 1	OK	14594	Spinning at normal speed
SFT 6 Fan 1 Rotor 0	OK	16167	Spinning at normal speed
SFT 6 Fan 1 Rotor 1	OK	14634	Spinning at normal speed
SFT 6 Fan 2 Rotor 0	OK	16167	Spinning at normal speed
SFT 6 Fan 2 Rotor 1	OK	14516	Spinning at normal speed
SFT 6 Fan 3 Rotor 0	OK	16666	Spinning at normal speed
SFT 6 Fan 3 Rotor 1	OK	14438	Spinning at normal speed
SFT 7 Fan 0 Rotor 0	OK	15517	Spinning at normal speed
SFT 7 Fan 0 Rotor 1	OK	14438	Spinning at normal speed
SFT 7 Fan 1 Rotor 0	OK	15517	Spinning at normal speed
SFT 7 Fan 1 Rotor 1	OK	14361	Spinning at normal speed
SFT 7 Fan 2 Rotor 0	OK	16167	Spinning at normal speed
SFT 7 Fan 2 Rotor 1	OK	14555	Spinning at normal speed
SFT 7 Fan 3 Rotor 0	OK	15697	Spinning at normal speed
SFT 7 Fan 3 Rotor 1	OK	14361	Spinning at normal speed

### show chassis fan (EX Series Switches)

```
user@host> show chassis fan
```

Item	Status	RPM	Measurement
Fan 1	OK	3477	Spinning at normal speed
Fan 2	OK	3477	Spinning at normal speed
Fan 3	OK	3479	Spinning at normal speed
Fan 4	OK	3508	Spinning at normal speed



Fan 5	OK	3517	Spinning at normal speed
Fan 6	OK	3531	Spinning at normal speed
Fan 7	OK	3439	Spinning at normal speed
Fan 8	OK	3424	Spinning at normal speed
Fan 9	OK	3413	Spinning at normal speed
Fan 10	OK	3439	Spinning at normal speed
Fan 11	OK	3446	Spinning at normal speed
Fan 12	OK	3432	Spinning at normal speed

### show chassis fan (T320 Router)

```
user@host> show chassis fan
```

Item	Status	RPM	Measurement
Top Left Front fan	OK	2850	Spinning at normal speed
Top Left Middle fan	OK	2820	Spinning at normal speed
Top Left Rear fan	OK	2970	Spinning at normal speed
Top Right Front fan	OK	2790	Spinning at normal speed
Top Right Middle fan	OK	2640	Spinning at normal speed
Top Right Rear fan	OK	2790	Spinning at normal speed
Bottom Left Front fan	OK	2520	Spinning at normal speed
Bottom Left Middle fan	OK	2610	Spinning at normal speed
Bottom Left Rear fan	OK	2550	Spinning at normal speed
Bottom Right Front fan	OK	2610	Spinning at normal speed
Bottom Right Middle fan	OK	2880	Spinning at normal speed
Bottom Right Rear fan	OK	2790	Spinning at normal speed
Rear Tray Top fan	OK	2130	Spinning at normal speed
Rear Tray Second fan	OK	2190	Spinning at normal speed
Rear Tray Middle fan	OK	2250	Spinning at normal speed
Rear Tray Fourth fan	OK	2220	Spinning at normal speed
Rear Tray Bottom fan	OK	2280	Spinning at normal speed

### show chassis fan (T640 Router)

```
user@host> show chassis fan
```

Item	Status	RPM	Measurement
Top Left Front fan	OK	3420	Spinning at normal speed
Top Left Middle fan	OK	3420	Spinning at normal speed
Top Left Rear fan	OK	3420	Spinning at normal speed
Top Right Front fan	OK	3420	Spinning at normal speed
Top Right Middle fan	OK	3420	Spinning at normal speed
Top Right Rear fan	OK	3450	Spinning at normal speed
Bottom Left Front fan	OK	3390	Spinning at normal speed
Bottom Left Middle fan	OK	3420	Spinning at normal speed
Bottom Left Rear fan	OK	3390	Spinning at normal speed
Bottom Right Front fan	OK	3390	Spinning at normal speed
Bottom Right Middle fan	OK	3390	Spinning at normal speed
Bottom Right Rear fan	OK	3390	Spinning at normal speed
Rear Tray Top fan	OK	5220	Spinning at normal speed
Rear Tray Second fan	OK	5220	Spinning at normal speed
Rear Tray Third fan	OK	5220	Spinning at normal speed
Rear Tray Fourth fan	OK	5220	Spinning at normal speed
Rear Tray Fifth fan	OK	5220	Spinning at normal speed
Rear Tray Sixth fan	OK	5220	Spinning at normal speed
Rear Tray Seventh fan	OK	5220	Spinning at normal speed
Rear Tray Bottom fan	OK	5220	Spinning at normal speed

## show chassis fan (T1600 Router)

```
user@host> show chassis fan
```

Item	Status	RPM	Measurement
Top Left Front fan	OK	3420	Spinning at normal speed
Top Left Middle fan	OK	3420	Spinning at normal speed
Top Left Rear fan	OK	3450	Spinning at normal speed
Top Right Front fan	OK	3420	Spinning at normal speed
Top Right Middle fan	OK	3420	Spinning at normal speed
Top Right Rear fan	OK	3390	Spinning at normal speed
Bottom Left Front fan	OK	3420	Spinning at normal speed
Bottom Left Middle fan	OK	3420	Spinning at normal speed
Bottom Left Rear fan	OK	3390	Spinning at normal speed
Bottom Right Front fan	OK	3390	Spinning at normal speed
Bottom Right Middle fan	OK	3420	Spinning at normal speed
Bottom Right Rear fan	OK	3390	Spinning at normal speed
Rear Tray Top fan	OK	5190	Spinning at normal speed
Rear Tray Second fan	OK	5190	Spinning at normal speed
Rear Tray Third fan	OK	5190	Spinning at normal speed
Rear Tray Fourth fan	OK	5190	Spinning at normal speed
Rear Tray Fifth fan	OK	5190	Spinning at normal speed
Rear Tray Sixth fan	OK	5190	Spinning at normal speed
Rear Tray Seventh fan	OK	5190	Spinning at normal speed
Rear Tray Bottom fan	OK	5190	Spinning at normal speed

## show chassis fan (T4000 Core Router)

```
user@host> show chassis fan
```

Item	Status	RPM	Measurement
Top Left Front fan	OK	5190	Spinning at high speed
Top Left Middle fan	OK	5220	Spinning at high speed
Top Left Rear fan	OK	5190	Spinning at high speed
Top Right Front fan	OK	5160	Spinning at high speed
Top Right Middle fan	OK	5190	Spinning at high speed
Top Right Rear fan	OK	5160	Spinning at high speed
Bottom Left Front fan	OK	6030	Spinning at high speed
Bottom Left Middle fan	OK	6090	Spinning at high speed
Bottom Left Rear fan	OK	6090	Spinning at high speed
Bottom Right Front fan	OK	6030	Spinning at high speed
Bottom Right Middle fan	OK	6060	Spinning at high speed
Bottom Right Rear fan	OK	6060	Spinning at high speed
Rear Tray Top fan	OK	10000	Spinning at high speed
Rear Tray Second fan	OK	10000	Spinning at high speed
Rear Tray Third fan	OK	10000	Spinning at high speed
Rear Tray Fourth fan	OK	10000	Spinning at high speed
Rear Tray Fifth fan	OK	10000	Spinning at high speed
Rear Tray Sixth fan	OK	10000	Spinning at high speed
Rear Tray Seventh fan	OK	10000	Spinning at high speed
Rear Tray Bottom fan	OK	10000	Spinning at high speed

## show chassis fan (TX Matrix Router)

```
user@host> show chassis fan
```

```
scc-re0:
```

Item	Status	RPM	Measurement
Top Left Front fan	OK	3420	Spinning at normal speed
Top Left Middle fan	OK	3390	Spinning at normal speed
Top Left Rear fan	OK	3420	Spinning at normal speed
Top Right Front fan	OK	3390	Spinning at normal speed
Top Right Middle fan	OK	3420	Spinning at normal speed
Top Right Rear fan	OK	3390	Spinning at normal speed
Bottom Left Front fan	OK	3420	Spinning at normal speed
Bottom Left Middle fan	OK	3450	Spinning at normal speed
Bottom Left Rear fan	OK	3420	Spinning at normal speed
Bottom Right Front fan	OK	3420	Spinning at normal speed
Bottom Right Middle fan	OK	3420	Spinning at normal speed
Bottom Right Rear fan	OK	3420	Spinning at normal speed
Rear Tray Top fan	OK	3420	Spinning at normal speed
Rear Tray Second fan	OK	5190	Spinning at normal speed
Rear Tray Third fan	OK	5190	Spinning at normal speed
Rear Tray Fourth fan	OK	5190	Spinning at normal speed
Rear Tray Fifth fan	OK	3420	Spinning at normal speed
Rear Tray Sixth fan	OK	3420	Spinning at normal speed
Rear Tray Seventh fan	OK	3420	Spinning at normal speed
Rear Tray Bottom fan	OK	3420	Spinning at normal speed

lcc2-re0:

Item	Status	RPM	Measurement
Top Left Front fan	OK	3420	Spinning at normal speed
Top Left Middle fan	OK	3420	Spinning at normal speed
Top Left Rear fan	OK	3450	Spinning at normal speed
Top Right Front fan	OK	3420	Spinning at normal speed
Top Right Middle fan	OK	3450	Spinning at normal speed
Top Right Rear fan	OK	3360	Spinning at normal speed
Bottom Left Front fan	OK	3420	Spinning at normal speed
Bottom Left Middle fan	OK	3480	Spinning at normal speed
Bottom Left Rear fan	OK	3420	Spinning at normal speed
Bottom Right Front fan	OK	3420	Spinning at normal speed
Bottom Right Middle fan	OK	3390	Spinning at normal speed
Bottom Right Rear fan	OK	3420	Spinning at normal speed
Rear Tray Top fan	OK	3420	Spinning at normal speed
Rear Tray Second fan	OK	3420	Spinning at normal speed
Rear Tray Third fan	OK	3420	Spinning at normal speed
Rear Tray Fourth fan	OK	3420	Spinning at normal speed
Rear Tray Fifth fan	OK	3420	Spinning at normal speed
Rear Tray Sixth fan	OK	3420	Spinning at normal speed
Rear Tray Seventh fan	OK	3420	Spinning at normal speed
Rear Tray Bottom fan	OK	3420	Spinning at normal speed

### show chassis fan (TX Matrix Plus Router)

user@host&gt; show chassis fan

sfc0-re0:

Item	Status	RPM	Measurement
Fan Tray 0 Fan 1	OK	4350	Spinning at normal speed
Fan Tray 0 Fan 2	OK	4380	Spinning at normal speed
Fan Tray 0 Fan 3	OK	4410	Spinning at normal speed
Fan Tray 0 Fan 4	OK	4380	Spinning at normal speed
Fan Tray 0 Fan 5	OK	4350	Spinning at normal speed
Fan Tray 0 Fan 6	OK	4380	Spinning at normal speed
Fan Tray 1 Fan 1	OK	4410	Spinning at normal speed

Fan Tray 1 Fan 2	OK	4380	Spinning at normal speed
Fan Tray 1 Fan 3	OK	4410	Spinning at normal speed
Fan Tray 1 Fan 4	OK	4380	Spinning at normal speed
Fan Tray 1 Fan 5	OK	4410	Spinning at normal speed
Fan Tray 1 Fan 6	OK	4410	Spinning at normal speed
Fan Tray 2 Fan 1	OK	4380	Spinning at normal speed
Fan Tray 2 Fan 2	OK	4380	Spinning at normal speed
Fan Tray 2 Fan 3	OK	4380	Spinning at normal speed
Fan Tray 2 Fan 4	OK	4410	Spinning at normal speed
Fan Tray 2 Fan 5	OK	4380	Spinning at normal speed
Fan Tray 2 Fan 6	OK	4410	Spinning at normal speed
Fan Tray 2 Fan 7	OK	4410	Spinning at normal speed
Fan Tray 2 Fan 8	OK	4380	Spinning at normal speed
Fan Tray 2 Fan 9	OK	4380	Spinning at normal speed
Fan Tray 3 Fan 1	OK	4350	Spinning at normal speed
Fan Tray 3 Fan 2	OK	4380	Spinning at normal speed
Fan Tray 3 Fan 3	OK	4410	Spinning at normal speed
Fan Tray 3 Fan 4	OK	4440	Spinning at normal speed
Fan Tray 3 Fan 5	OK	4380	Spinning at normal speed
Fan Tray 3 Fan 6	OK	4410	Spinning at normal speed
Fan Tray 3 Fan 7	OK	4410	Spinning at normal speed
Fan Tray 3 Fan 8	OK	4380	Spinning at normal speed
Fan Tray 3 Fan 9	OK	4410	Spinning at normal speed
Fan Tray 4 Fan 1	OK	4410	Spinning at normal speed
Fan Tray 4 Fan 2	OK	4410	Spinning at normal speed
Fan Tray 4 Fan 3	OK	4380	Spinning at normal speed
Fan Tray 4 Fan 4	OK	4380	Spinning at normal speed
Fan Tray 4 Fan 5	OK	4410	Spinning at normal speed
Fan Tray 4 Fan 6	OK	4410	Spinning at normal speed
Fan Tray 4 Fan 7	OK	4410	Spinning at normal speed
Fan Tray 4 Fan 8	OK	4410	Spinning at normal speed
Fan Tray 4 Fan 9	OK	4410	Spinning at normal speed
Fan Tray 5 Fan 1	OK	4350	Spinning at normal speed
Fan Tray 5 Fan 2	OK	4380	Spinning at normal speed
Fan Tray 5 Fan 3	OK	4380	Spinning at normal speed
Fan Tray 5 Fan 4	OK	4350	Spinning at normal speed
Fan Tray 5 Fan 5	OK	4380	Spinning at normal speed
Fan Tray 5 Fan 6	OK	4410	Spinning at normal speed
Fan Tray 5 Fan 7	OK	4410	Spinning at normal speed
Fan Tray 5 Fan 8	OK	4380	Spinning at normal speed
Fan Tray 5 Fan 9	OK	4410	Spinning at normal speed

1cc0-re0:

Item	Status	RPM	Measurement
Top Left Front fan	OK	3420	Spinning at normal speed
Top Left Middle fan	OK	3420	Spinning at normal speed
Top Left Rear fan	OK	3420	Spinning at normal speed
Top Right Front fan	OK	3450	Spinning at normal speed
Top Right Middle fan	OK	3420	Spinning at normal speed
Top Right Rear fan	OK	3420	Spinning at normal speed
Bottom Left Front fan	OK	3420	Spinning at normal speed
Bottom Left Middle fan	OK	3420	Spinning at normal speed
Bottom Left Rear fan	OK	3390	Spinning at normal speed
Bottom Right Front fan	OK	3420	Spinning at normal speed
Bottom Right Middle fan	OK	3390	Spinning at normal speed
Bottom Right Rear fan	OK	3390	Spinning at normal speed
Rear Tray Top fan	OK	7050	Spinning at normal speed
Rear Tray Second fan	OK	7050	Spinning at normal speed
Rear Tray Third fan	OK	7050	Spinning at normal speed

Rear Tray Fourth fan	OK	7050	Spinning at normal speed
Rear Tray Fifth fan	OK	7050	Spinning at normal speed
Rear Tray Sixth fan	OK	7050	Spinning at normal speed
Rear Tray Seventh fan	OK	7050	Spinning at normal speed
Rear Tray Bottom fan	OK	7050	Spinning at normal speed

### show chassis fan (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis fan
```

```
sfc0-re0:
```

Item	Status	RPM	Measurement
Fan Tray 0 Fan 1	OK	4830	Spinning at normal speed
Fan Tray 0 Fan 2	OK	4860	Spinning at normal speed
Fan Tray 0 Fan 3	OK	4830	Spinning at normal speed
Fan Tray 0 Fan 4	OK	4800	Spinning at normal speed
Fan Tray 0 Fan 5	OK	4830	Spinning at normal speed
Fan Tray 0 Fan 6	OK	4770	Spinning at normal speed
Fan Tray 1 Fan 1	OK	4800	Spinning at normal speed
Fan Tray 1 Fan 2	OK	4770	Spinning at normal speed
Fan Tray 1 Fan 3	OK	4800	Spinning at normal speed
Fan Tray 1 Fan 4	OK	4770	Spinning at normal speed
Fan Tray 1 Fan 5	OK	4770	Spinning at normal speed
Fan Tray 1 Fan 6	OK	4800	Spinning at normal speed
Fan Tray 2 Fan 1	OK	4800	Spinning at normal speed
Fan Tray 2 Fan 2	OK	4800	Spinning at normal speed
Fan Tray 2 Fan 3	OK	4830	Spinning at normal speed
Fan Tray 2 Fan 4	OK	4830	Spinning at normal speed
Fan Tray 2 Fan 5	OK	4830	Spinning at normal speed
Fan Tray 2 Fan 6	OK	4830	Spinning at normal speed
Fan Tray 2 Fan 7	OK	4800	Spinning at normal speed
Fan Tray 2 Fan 8	OK	4830	Spinning at normal speed
Fan Tray 2 Fan 9	OK	4800	Spinning at normal speed
Fan Tray 3 Fan 1	OK	4860	Spinning at normal speed
Fan Tray 3 Fan 2	OK	4860	Spinning at normal speed
Fan Tray 3 Fan 3	OK	4800	Spinning at normal speed
Fan Tray 3 Fan 4	OK	4830	Spinning at normal speed
Fan Tray 3 Fan 5	OK	4830	Spinning at normal speed
Fan Tray 3 Fan 6	OK	4830	Spinning at normal speed
Fan Tray 3 Fan 7	OK	4830	Spinning at normal speed
Fan Tray 3 Fan 8	OK	4800	Spinning at normal speed
Fan Tray 3 Fan 9	OK	4800	Spinning at normal speed
Fan Tray 4 Fan 1	OK	4830	Spinning at normal speed
Fan Tray 4 Fan 2	OK	4830	Spinning at normal speed
Fan Tray 4 Fan 3	OK	4830	Spinning at normal speed
Fan Tray 4 Fan 4	OK	4830	Spinning at normal speed
Fan Tray 4 Fan 5	OK	4830	Spinning at normal speed
Fan Tray 4 Fan 6	OK	4860	Spinning at normal speed
Fan Tray 4 Fan 7	OK	4800	Spinning at normal speed
Fan Tray 4 Fan 8	OK	4860	Spinning at normal speed
Fan Tray 4 Fan 9	OK	4770	Spinning at normal speed
Fan Tray 5 Fan 1	OK	4830	Spinning at normal speed
Fan Tray 5 Fan 2	OK	4830	Spinning at normal speed
Fan Tray 5 Fan 3	OK	4830	Spinning at normal speed
Fan Tray 5 Fan 4	OK	4800	Spinning at normal speed
Fan Tray 5 Fan 5	OK	4800	Spinning at normal speed
Fan Tray 5 Fan 6	OK	4800	Spinning at normal speed
Fan Tray 5 Fan 7	OK	4830	Spinning at normal speed
Fan Tray 5 Fan 8	OK	4830	Spinning at normal speed

Fan Tray 5 Fan 9		Check	2010		
lcc0-re0:					
Item	Status	RPM	Measurement		
Top Left Front fan	OK	3420	Spinning	at normal	speed
Top Left Middle fan	OK	3390	Spinning	at normal	speed
Top Left Rear fan	OK	3390	Spinning	at normal	speed
Top Right Front fan	OK	3420	Spinning	at normal	speed
Top Right Middle fan	OK	3420	Spinning	at normal	speed
Top Right Rear fan	OK	3450	Spinning	at normal	speed
Bottom Left Front fan	OK	3420	Spinning	at normal	speed
Bottom Left Middle fan	OK	3390	Spinning	at normal	speed
Bottom Left Rear fan	OK	3420	Spinning	at normal	speed
Bottom Right Front fan	OK	3420	Spinning	at normal	speed
Bottom Right Middle fan	OK	3390	Spinning	at normal	speed
Bottom Right Rear fan	OK	3420	Spinning	at normal	speed
Rear Tray fan 1 (Top)	OK	7740	Spinning	at normal	speed
Rear Tray fan 2	OK	7740	Spinning	at normal	speed
Rear Tray fan 3	OK	7740	Spinning	at normal	speed
Rear Tray fan 4	OK	7740	Spinning	at normal	speed
Rear Tray fan 5	OK	7740	Spinning	at normal	speed
Rear Tray fan 6	OK	7740	Spinning	at normal	speed
Rear Tray fan 7	OK	7740	Spinning	at normal	speed
Rear Tray fan 8	OK	7740	Spinning	at normal	speed
Rear Tray fan 9	OK	7740	Spinning	at normal	speed
Rear Tray fan 10	OK	7740	Spinning	at normal	speed
Rear Tray fan 11	OK	7740	Spinning	at normal	speed
Rear Tray fan 12	OK	7740	Spinning	at normal	speed
Rear Tray fan 13	OK	7740	Spinning	at normal	speed
Rear Tray fan 14	OK	7740	Spinning	at normal	speed
Rear Tray fan 15	OK	7740	Spinning	at normal	speed
Rear Tray fan 16 (Bottom)	OK	7740	Spinning	at normal	speed
lcc2-re0:					
Item	Status	RPM	Measurement		
Top Left Front fan	OK	3420	Spinning	at normal	speed
Top Left Middle fan	OK	3390	Spinning	at normal	speed
Top Left Rear fan	OK	3420	Spinning	at normal	speed
Top Right Front fan	OK	3420	Spinning	at normal	speed
Top Right Middle fan	OK	3420	Spinning	at normal	speed
Top Right Rear fan	OK	3450	Spinning	at normal	speed
Bottom Left Front fan	OK	3420	Spinning	at normal	speed
Bottom Left Middle fan	OK	3390	Spinning	at normal	speed
Bottom Left Rear fan	OK	3420	Spinning	at normal	speed
Bottom Right Front fan	OK	3420	Spinning	at normal	speed
Bottom Right Middle fan	OK	3390	Spinning	at normal	speed
Bottom Right Rear fan	OK	3420	Spinning	at normal	speed
Rear Tray fan 1 (Top)	OK	7740	Spinning	at normal	speed
Rear Tray fan 2	OK	7740	Spinning	at normal	speed
Rear Tray fan 3	OK	7740	Spinning	at normal	speed
Rear Tray fan 4	OK	7740	Spinning	at normal	speed
Rear Tray fan 5	OK	7740	Spinning	at normal	speed
Rear Tray fan 6	OK	7740	Spinning	at normal	speed
Rear Tray fan 7	OK	7740	Spinning	at normal	speed
Rear Tray fan 8	OK	7740	Spinning	at normal	speed
Rear Tray fan 9	OK	7740	Spinning	at normal	speed
Rear Tray fan 10	OK	7740	Spinning	at normal	speed
Rear Tray fan 11	OK	7740	Spinning	at normal	speed

Rear Tray fan 12	OK	7740	Spinning at normal speed
Rear Tray fan 13	OK	7740	Spinning at normal speed
Rear Tray fan 14	OK	7740	Spinning at normal speed
Rear Tray fan 15	OK	7740	Spinning at normal speed
Rear Tray fan 16 (Bottom)	OK	7740	Spinning at normal speed

### show chassis fan (PTX5000 Packet Transport Router)

```
user@host> show chassis fan
```

```
user@host> show chassis fan
```

Item	Status	% RPM	Measurement
Fan Tray 0 Fan 1	OK	29%	2700 RPM
Fan Tray 0 Fan 2	OK	29%	2700 RPM
Fan Tray 0 Fan 3	OK	29%	2742 RPM
Fan Tray 0 Fan 4	OK	29%	2700 RPM
Fan Tray 0 Fan 5	OK	30%	2828 RPM
Fan Tray 0 Fan 6	OK	30%	2828 RPM
Fan Tray 0 Fan 7	OK	29%	2700 RPM
Fan Tray 0 Fan 8	OK	30%	2785 RPM
Fan Tray 0 Fan 9	OK	30%	2828 RPM
Fan Tray 0 Fan 10	OK	30%	2828 RPM
Fan Tray 0 Fan 11	OK	30%	2785 RPM
Fan Tray 0 Fan 12	OK	30%	2828 RPM
Fan Tray 0 Fan 13	OK	31%	2871 RPM
Fan Tray 0 Fan 14	OK	30%	2828 RPM
Fan Tray 1 Fan 1	OK	42%	3033 RPM
Fan Tray 1 Fan 2	OK	42%	3066 RPM
Fan Tray 1 Fan 3	OK	43%	3099 RPM
Fan Tray 1 Fan 4	OK	43%	3166 RPM
Fan Tray 1 Fan 5	OK	45%	3266 RPM
Fan Tray 1 Fan 6	OK	43%	3133 RPM
Fan Tray 2 Fan 1	OK	29%	2099 RPM
Fan Tray 2 Fan 2	OK	30%	2199 RPM
Fan Tray 2 Fan 3	OK	30%	2166 RPM
Fan Tray 2 Fan 4	OK	33%	2399 RPM
Fan Tray 2 Fan 5	OK	29%	2133 RPM
Fan Tray 2 Fan 6	OK	32%	2366 RPM

### show chassis fan (PTX10008 Router)

```
user@host> show chassis fan
```

Item	Status	RPM	Measurement
Fan Tray 0 Fan 0	OK	9000	Spinning at normal speed
Fan Tray 0 Fan 1	OK	9000	Spinning at normal speed
Fan Tray 0 Fan 2	OK	9150	Spinning at normal speed
Fan Tray 0 Fan 3	OK	9150	Spinning at normal speed
Fan Tray 0 Fan 4	OK	9000	Spinning at normal speed
Fan Tray 0 Fan 5	OK	9150	Spinning at normal speed
Fan Tray 0 Fan 6	OK	9000	Spinning at normal speed
Fan Tray 0 Fan 7	OK	9150	Spinning at normal speed
Fan Tray 0 Fan 8	OK	8850	Spinning at normal speed
Fan Tray 0 Fan 9	OK	8850	Spinning at normal speed
Fan Tray 0 Fan 10	OK	9000	Spinning at normal speed
Fan Tray 1 Fan 0	OK	9150	Spinning at normal speed
Fan Tray 1 Fan 1	OK	9150	Spinning at normal speed
Fan Tray 1 Fan 2	OK	9000	Spinning at normal speed
Fan Tray 1 Fan 3	OK	9000	Spinning at normal speed

Fan Tray 1 Fan 4	OK	9000	Spinning at normal speed
Fan Tray 1 Fan 5	OK	9000	Spinning at normal speed
Fan Tray 1 Fan 6	OK	9000	Spinning at normal speed
Fan Tray 1 Fan 7	OK	9150	Spinning at normal speed
Fan Tray 1 Fan 8	OK	9000	Spinning at normal speed
Fan Tray 1 Fan 9	OK	9000	Spinning at normal speed
Fan Tray 1 Fan 10	OK	9000	Spinning at normal speed

**show chassis fan (MX150)**

user@host &gt; show chassis fan

Item	Status	RPM	Measurement
FPC 0 Tray 0 Fan 0	OK	7419	Spinning at normal speed
FPC 0 Tray 1 Fan 0	OK	7419	Spinning at normal speed

**show chassis fan (MX104 Router)**

user@host &gt; show chassis fan

Item	Status	RPM	Measurement
Fan 1	OK	5640	Spinning at normal speed
Fan 2	OK	5640	Spinning at normal speed
Fan 3	OK	5760	Spinning at normal speed
Fan 4	OK	5640	Spinning at normal speed
Fan 5	OK	5640	Spinning at normal speed

**show chassis fan (MX2010 Router)**

user@host &gt; show chassis fan

Item	Status	% RPM	Measurement
Fan Tray 0 Fan 1	OK	37%	3360 RPM
Fan Tray 0 Fan 2	OK	38%	3480 RPM
Fan Tray 0 Fan 3	OK	37%	3360 RPM
Fan Tray 0 Fan 4	OK	37%	3360 RPM
Fan Tray 0 Fan 5	OK	38%	3480 RPM
Fan Tray 0 Fan 6	OK	37%	3360 RPM
Fan Tray 1 Fan 1	OK	38%	3480 RPM
Fan Tray 1 Fan 2	OK	40%	3600 RPM
Fan Tray 1 Fan 3	OK	38%	3480 RPM
Fan Tray 1 Fan 4	OK	38%	3480 RPM
Fan Tray 1 Fan 5	OK	38%	3480 RPM
Fan Tray 1 Fan 6	OK	38%	3480 RPM
Fan Tray 2 Fan 1	OK	38%	3480 RPM
Fan Tray 2 Fan 2	OK	41%	3720 RPM
Fan Tray 2 Fan 3	OK	38%	3480 RPM
Fan Tray 2 Fan 4	OK	38%	3480 RPM
Fan Tray 2 Fan 5	OK	38%	3480 RPM
Fan Tray 2 Fan 6	OK	38%	3480 RPM
Fan Tray 3 Fan 1	OK	38%	3480 RPM
Fan Tray 3 Fan 2	OK	40%	3600 RPM
Fan Tray 3 Fan 3	OK	40%	3600 RPM
Fan Tray 3 Fan 4	OK	40%	3600 RPM
Fan Tray 3 Fan 5	OK	40%	3600 RPM
Fan Tray 3 Fan 6	OK	38%	3480 RPM



## show chassis fan (MX2020 Router)

user@host &gt; show chassis fan

Item	Status	% RPM	Measurement
Fan Tray 0 Fan 1	OK	37%	3360 RPM
Fan Tray 0 Fan 2	OK	37%	3360 RPM
Fan Tray 0 Fan 3	OK	36%	3240 RPM
Fan Tray 0 Fan 4	OK	37%	3360 RPM
Fan Tray 0 Fan 5	OK	37%	3360 RPM
Fan Tray 0 Fan 6	OK	37%	3360 RPM
Fan Tray 1 Fan 1	OK	37%	3360 RPM
Fan Tray 1 Fan 2	OK	37%	3360 RPM
Fan Tray 1 Fan 3	OK	37%	3360 RPM
Fan Tray 1 Fan 4	OK	37%	3360 RPM
Fan Tray 1 Fan 5	OK	37%	3360 RPM
Fan Tray 1 Fan 6	OK	36%	3240 RPM
Fan Tray 2 Fan 1	OK	37%	3360 RPM
Fan Tray 2 Fan 2	OK	37%	3360 RPM
Fan Tray 2 Fan 3	OK	37%	3360 RPM
Fan Tray 2 Fan 4	OK	37%	3360 RPM
Fan Tray 2 Fan 5	OK	37%	3360 RPM
Fan Tray 2 Fan 6	OK	38%	3480 RPM
Fan Tray 3 Fan 1	OK	38%	3480 RPM
Fan Tray 3 Fan 2	OK	38%	3480 RPM
Fan Tray 3 Fan 3	OK	38%	3480 RPM
Fan Tray 3 Fan 4	OK	37%	3360 RPM
Fan Tray 3 Fan 5	OK	37%	3360 RPM
Fan Tray 3 Fan 6	OK	37%	3360 RPM

## show chassis fan (MX2008 Router)

user@host &gt; show chassis fan

Item	Status	% RPM	Measurement
Fan Tray 0 Fan 1	OK	64%	5760 RPM
Fan Tray 0 Fan 2	OK	62%	5640 RPM
Fan Tray 0 Fan 3	OK	64%	5760 RPM
Fan Tray 0 Fan 4	OK	60%	5400 RPM
Fan Tray 0 Fan 5	OK	61%	5520 RPM
Fan Tray 0 Fan 6	OK	62%	5640 RPM
Fan Tray 1 Fan 1	OK	61%	5520 RPM
Fan Tray 1 Fan 2	OK	61%	5520 RPM
Fan Tray 1 Fan 3	OK	61%	5520 RPM
Fan Tray 1 Fan 4	OK	62%	5640 RPM
Fan Tray 1 Fan 5	OK	62%	5640 RPM
Fan Tray 1 Fan 6	OK	64%	5760 RPM

## show chassis fan (MX10003 Router)

user@host&gt; show chassis fan

Item	Status	% RPM	Measurement
Fan Tray 0 Fan 0	OK	40%	7296 RPM
Fan Tray 0 Fan 1	OK	40%	6656 RPM
Fan Tray 0 Fan 2	OK	40%	7296 RPM
Fan Tray 0 Fan 3	OK	40%	6400 RPM
Fan Tray 1 Fan 0	OK	40%	7296 RPM
Fan Tray 1 Fan 1	OK	40%	6528 RPM

Fan Tray 1 Fan 2	OK	40%	7296 RPM
Fan Tray 1 Fan 3	OK	40%	6784 RPM
Fan Tray 2 Fan 0	OK	40%	7552 RPM
Fan Tray 2 Fan 1	OK	40%	6784 RPM
Fan Tray 2 Fan 2	OK	40%	7424 RPM
Fan Tray 2 Fan 3	OK	40%	6528 RPM
Fan Tray 3 Fan 0	OK	40%	7552 RPM
Fan Tray 3 Fan 1	OK	40%	6528 RPM
Fan Tray 3 Fan 2	OK	40%	7296 RPM
Fan Tray 3 Fan 3	OK	40%	6656 RPM

**show chassis fan (MX204 Router)**

```
user@host> show chassis fan
```

Item	Status	% RPM	Measurement
Fan Tray 0 Fan 0	OK	40%	9344 RPM
Fan Tray 0 Fan 1	OK	40%	8576 RPM
Fan Tray 1 Fan 0	OK	40%	9344 RPM
Fan Tray 1 Fan 1	OK	40%	8832 RPM
Fan Tray 2 Fan 0	OK	40%	9344 RPM
Fan Tray 2 Fan 1	OK	40%	8576 RPM

**show chassis fan (MX10008 Router)**

```
user@host> show chassis fan
```

Item	Status	RPM	Measurement
Fan Tray 0 Fan 0	OK	9750	Spinning at normal speed
Fan Tray 0 Fan 1	OK	9750	Spinning at normal speed
Fan Tray 0 Fan 2	OK	9900	Spinning at normal speed
Fan Tray 0 Fan 3	OK	9600	Spinning at normal speed
Fan Tray 0 Fan 4	Failed		
Fan Tray 0 Fan 5	Failed		
Fan Tray 0 Fan 6	OK	9750	Spinning at normal speed
Fan Tray 0 Fan 7	OK	9750	Spinning at normal speed
Fan Tray 0 Fan 8	OK	9600	Spinning at normal speed
Fan Tray 0 Fan 9	OK	9600	Spinning at normal speed
Fan Tray 0 Fan 10	OK	9600	Spinning at normal speed
Fan Tray 1 Fan 0	OK	9600	Spinning at normal speed
Fan Tray 1 Fan 1	OK	9600	Spinning at normal speed
Fan Tray 1 Fan 2	OK	9750	Spinning at normal speed
Fan Tray 1 Fan 3	OK	9600	Spinning at normal speed
Fan Tray 1 Fan 4	OK	9600	Spinning at normal speed
Fan Tray 1 Fan 5	OK	9600	Spinning at normal speed
Fan Tray 1 Fan 6	OK	9600	Spinning at normal speed
Fan Tray 1 Fan 7	OK	9750	Spinning at normal speed
Fan Tray 1 Fan 8	OK	9750	Spinning at normal speed
Fan Tray 1 Fan 9	OK	9600	Spinning at normal speed
Fan Tray 1 Fan 10	OK	9600	Spinning at normal speed

**show chassis fan (ACX4000 Router)**

```
user@host > show chassis fan
```

Item	Status	RPM	Measurement
Fan 1	OK	4140	Spinning at normal speed
Fan 2	OK	4200	Spinning at normal speed

### show chassis fan (ACX5048 Router)

```
user@host > show chassis fan
```

Item	Status	RPM	Measurement
FPC 0 Tray 0 Fan 0	OK	18305	Spinning at normal speed
FPC 0 Tray 0 Fan 1	OK	15743	Spinning at normal speed
FPC 0 Tray 1 Fan 0	OK	18305	Spinning at normal speed
FPC 0 Tray 1 Fan 1	OK	15606	Spinning at normal speed
FPC 0 Tray 2 Fan 0	OK	19014	Spinning at normal speed
FPC 0 Tray 2 Fan 1	OK	16167	Spinning at normal speed
FPC 0 Tray 3 Fan 0	OK	18947	Spinning at normal speed
FPC 0 Tray 3 Fan 1	OK	16265	Spinning at normal speed
FPC 0 Tray 4 Fan 0	OK	18120	Spinning at normal speed
FPC 0 Tray 4 Fan 1	OK	15743	Spinning at normal speed

### show chassis fan (QFX5100 Switch and OCX Series)

```
user@switch > show chassis fan
```

Item	Status	RPM	Measurement
FPC 0 Tray 0 Fan 0	OK	6428	Spinning at normal speed
FPC 0 Tray 0 Fan 1	OK	5515	Spinning at normal speed
FPC 0 Tray 1 Fan 0	OK	6360	Spinning at normal speed
FPC 0 Tray 1 Fan 1	OK	5532	Spinning at normal speed

### show chassis fan (EX9251 switches)

```
user@switch > show chassis fan
```

Item	Status	% RPM	Measurement
Fan Tray 0 Fan 0	OK	40%	9600 RPM
Fan Tray 0 Fan 1	OK	40%	8832 RPM
Fan Tray 1 Fan 0	OK	40%	9728 RPM
Fan Tray 1 Fan 1	OK	40%	9088 RPM
Fan Tray 2	Absent		

### show chassis fan (EX9253 switches)

```
user@switch > show chassis fan
```

Item	Status	% RPM	Measurement
Fan Tray 0 Fan 0	OK	40%	7552 RPM
Fan Tray 0 Fan 1	OK	40%	6272 RPM
Fan Tray 0 Fan 2	OK	40%	7552 RPM
Fan Tray 0 Fan 3	OK	40%	6272 RPM
Fan Tray 1 Fan 0	OK	40%	7552 RPM
Fan Tray 1 Fan 1	OK	40%	6272 RPM
Fan Tray 1 Fan 2	OK	40%	7552 RPM
Fan Tray 1 Fan 3	OK	40%	6272 RPM
Fan Tray 2 Fan 0	OK	40%	7552 RPM
Fan Tray 2 Fan 1	OK	40%	6400 RPM
Fan Tray 2 Fan 2	OK	40%	7552 RPM

Fan Tray 2 Fan 3	OK	40%	6272 RPM
Fan Tray 3 Fan 0	OK	40%	7552 RPM
Fan Tray 3 Fan 1	OK	40%	6400 RPM
Fan Tray 3 Fan 2	OK	40%	7552 RPM
Fan Tray 3 Fan 3	OK	40%	6272 RPM

## show chassis feb

<b>Syntax</b>	show chassis feb
<b>Release Information</b>	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 12.2 for the ACX Series Universal Metro Routers.
<b>Description</b>	(ACX Series routers, and M5, M10, and M120 routers only) Display Forwarding Engine Board (FEB) status information.
<b>Options</b>	This command has no options.
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">request chassis feb on page 856</a></li> <li>• <a href="#">show chassis fabric feb on page 1405</a></li> <li>• <a href="#">show chassis fpc-feb-connectivity on page 1723</a></li> <li>• <i>feb</i></li> <li>• <i>Understanding Switching Control Board Redundancy</i></li> </ul>
<b>List of Sample Output</b>	<a href="#">show chassis feb (M10 Router) on page 1644</a> <a href="#">show chassis feb (M120 Router) on page 1644</a> <a href="#">show chassis feb detail (M120 Router) on page 1645</a> <a href="#">show chassis feb detail (ACX2000 Universal Metro Router) on page 1646</a> <a href="#">show chassis feb detail (ACX1000 Universal Metro Router) on page 1646</a>
<b>Output Fields</b>	<a href="#">Table 136 on page 1643</a> lists the output fields for the <b>show chassis feb</b> command. Output fields are listed in the approximate order in which they appear.

Table 136: show chassis feb

Field Name	Field Description
State	State of the FEB: <ul style="list-style-type: none"> <li>• <b>Offline</b>—FEB is powered down.</li> <li>• <b>Online</b>—FEB is operational and running.</li> <li>• <b>Check</b>—FEB is in alarmed state where the Switch Interface Board (SIB) plane is partially operational for the following reasons:               <ul style="list-style-type: none"> <li>• FEB is not inserted properly.</li> <li>• Two or more links between the FEB and Packet Forwarding Engine fail.</li> </ul> </li> </ul>
Temp (C) or Intake temperature	Temperature of the air passing by the FEB, in degrees Celsius or in both degrees Celsius and degrees Fahrenheit.

Table 136: show chassis feb (continued)

Field Name	Field Description
CPU Utilization (%)	Percentage of CPU being used: <ul style="list-style-type: none"> <li><b>Total</b>—Total percentage of CPU being used by the FEB processor.</li> <li><b>Interrupt</b>—Of the total CPU being used by the FEB processor, the percentage being used for interrupts.</li> </ul>
Memory DRAM (MB)	Total DRAM, in megabytes, available to the FEB processor.
Utilization (%)	Percentage of memory utilization: <ul style="list-style-type: none"> <li><b>Heap</b>—Percentage of heap space (dynamic memory) being used by the FEB processor. If this number exceeds 80 percent, you might experience a software problem (memory leak).</li> <li><b>Buffer</b>—Percentage of buffer space being used by the FPC processor for buffering internal messages.</li> </ul>
Exhaust A temperature	Temperature of the air flowing past Exhaust A.
Exhaust B temperature	Temperature of the air flowing past Exhaust B.
Total DDR DRAM	Amount of double data rate dynamic random access memory (DDR DRAM) available to the FEB CPU.
Total RDRAM	Amount of reduced latency dynamic random access memory (RDRAM) available to the FEB CPU.
Start time (Detail output only)	Time when the Routing Engine detected that the FEB was running.
Uptime (Detail output only)	How long the Routing Engine has been connected to the FEB, and therefore, how long the Flexible PIC Concentrator (PIC) has been up and running.

## Sample Output

### show chassis feb (M10 Router)

```

user@host> show chassis feb

FEB status:
  Temperature           27 degrees C / 80 degrees F
  CPU utilization        3 percent
  Interrupt utilization  0 percent
  Heap utilization       26 percent
  Buffer utilization      50 percent
  Total CPU DRAM         64 MB
  Internet Processor II  Version 1, Foundry IBM, Part number 9
  Start time:            2010-05-23 13:59:51 PDT
  Uptime:                6 hours, 33 minutes, 11 seconds

```

### show chassis feb (M120 Router)

```

user@host> show chassis feb

Slot State      Temp  CPU Utilization (%)  Memory  Utilization (%)
              (C)   Total  Interrupt  DRAM (MB) Heap    Buffer
0 Online        47     4        0      512       7     60

```

1	Online	54	3	0	512	7	59
2	Online	50	4	0	512	7	59
3	Online	49	4	0	512	7	59
4	Online	46	3	0	512	7	59
5	Online	35	3	0	512	7	59

### show chassis feb detail (M120 Router)

```
user@host> show chassis feb detail
```

#### Slot 0 information:

```
State Online
Intake temperature 48 degrees C / 118 degrees F
Exhaust A temperature 51 degrees C / 123 degrees F
Exhaust B temperature 52 degrees C / 125 degrees F
Total DDR DRAM 512 MB
Total RLD RAM 32 MB
Start time: 2006-06-28 15:00:40 PDT
Uptime: 10 minutes, 21 seconds
```

#### Slot 1 information:

```
State Online
Intake temperature 55 degrees C / 131 degrees F
Exhaust A temperature 46 degrees C / 114 degrees F
Exhaust B temperature 45 degrees C / 113 degrees F
Total DDR DRAM 512 MB
Total RLD RAM 32 MB
Start time: 2006-06-28 15:00:33 PDT
Uptime: 10 minutes, 28 seconds
```

#### Slot 2 information:

```
State Online
Intake temperature 50 degrees C / 122 degrees F
Exhaust A temperature 47 degrees C / 116 degrees F
Exhaust B temperature 47 degrees C / 116 degrees F
Total DDR DRAM 512 MB
Total RLD RAM 32 MB
Start time: 2006-06-28 15:00:35 PDT
Uptime: 10 minutes, 26 seconds
```

#### Slot 3 information:

```
State Online
Intake temperature 49 degrees C / 120 degrees F
Exhaust A temperature 47 degrees C / 116 degrees F
Exhaust B temperature 49 degrees C / 120 degrees F
Total DDR DRAM 512 MB
Total RLD RAM 32 MB
Start time: 2006-06-28 15:00:43 PDT
Uptime: 10 minutes, 18 seconds
```

#### Slot 4 information:

```
State Online
Intake temperature 45 degrees C / 113 degrees F
Exhaust A temperature 42 degrees C / 107 degrees F
Exhaust B temperature 42 degrees C / 107 degrees F
Total DDR DRAM 512 MB
Total RLD RAM 32 MB
Start time: 2006-06-28 15:00:29 PDT
Uptime: 10 minutes, 32 seconds
```

#### Slot 5 information:

```
State Online
Intake temperature 35 degrees C / 95 degrees F
Exhaust A temperature 33 degrees C / 91 degrees F
Exhaust B temperature 40 degrees C / 104 degrees F
```

```
Total DDR DRAM          512 MB
Total RLDRAM             32 MB
Start time:              2006-06-28 15:00:27 PDT
Uptime:                  10 minutes, 34 seconds
```

#### show chassis feb detail (ACX2000 Universal Metro Router)

```
user@host> show chassis feb
```

```
FEB status:
Slot 0 information:
  State                Online
  Temperature          72 degrees C / 161 degrees F
  CPU utilization       17 percent
  Interrupt utilization 7 percent
  Heap utilization      20 percent
  Buffer utilization     37 percent
  Total CPU DRAM        512 MB
  Start time:           2012-05-09 00:58:51 PDT
  Uptime:               5 days, 21 hours, 6 minutes, 34 seconds
```

#### show chassis feb detail (ACX1000 Universal Metro Router)

```
user@host> show chassis feb
```

```
FEB status:
Slot 0 information:
  State                Online
  Temperature          46 degrees C / 114 degrees F
  CPU utilization       15 percent
  Interrupt utilization 5 percent
  Heap utilization      45 percent
  Buffer utilization     37 percent
  Total CPU DRAM        256 MB
  Start time:           2012-06-05 19:51:53 PDT
  Uptime:               19 minutes, 6 seconds
```



## show chassis firmware

<b>List of Syntax</b>	Syntax on page 1647
	Syntax (TX Matrix Routers) on page 1647
	Syntax (TX Matrix Plus Routers) on page 1647
	Syntax (MX Series Routers) on page 1647
	Syntax (MX104, MX204, MX2010, MX2020, MX10003, and MX2008 Universal Routing Platforms) on page 1647
	Syntax (MX10008 Universal Routing Platforms) on page 1647
	Syntax (PTX Series) on page 1647
	Syntax (QFX Series) on page 1648
	Syntax (OCX Series) on page 1648
	Syntax (ACX Series Universal Metro Routers) on page 1648
	Syntax (ACX5048 and ACX5096 Routers) on page 1648
	Syntax (ACX500 Routers) on page 1648
	Syntax (EX Series Switches) on page 1648

<b>Syntax</b>	show chassis firmware
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<b>Syntax (TX Matrix Routers)</b>	show chassis firmware <lcc <i>number</i>   scc>
-----------------------------------	--

<b>Syntax (TX Matrix Plus Routers)</b>	show chassis firmware <lcc <i>number</i>   sfc <i>number</i> >
--	---

<b>Syntax (MX Series Routers)</b>	show chassis firmware <all-members> <local> <member <i>member-id</i> >
-----------------------------------	---

<b>Syntax (MX104, MX204, MX2010, MX2020, MX10003, and MX2008 Universal Routing Platforms)</b>	show chassis firmware <satellite [slot-id <i>slot-id</i>   device-alias <i>alias-name</i> ]>
---	---

<b>Syntax (MX10008 Universal Routing Platforms)</b>	show chassis firmware
---	-----------------------

<b>Syntax (PTX Series)</b>	show chassis firmware
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Syntax (QFX Series)	show chassis firmware interconnect-device <i>name</i> node-device <i>name</i>
Syntax (OCX Series)	show chassis firmware
Syntax (ACX Series Universal Metro Routers)	show chassis firmware
Syntax (ACX5048 and ACX5096 Routers)	show chassis firmware interconnect-device <i>name</i> node-device <i>name</i>
Syntax (ACX500 Routers)	show chassis firmware
Syntax (EX Series Switches)	show chassis firmware <detail> <satellite [slot-id <i>slot-id</i>  device-alias <i>alias-name</i> ]>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.4 for EX Series switches.</p> <p>sfc option introduced in Junos OS Release 9.6 for the TX Matrix Plus router.</p> <p>Command introduced for EX8200 switches in Junos OS Release 10.2 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for QFX Series.</p> <p>Command introduced in Junos OS Release 12.2 for ACX Series Universal Metro Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 and MX2020 Universal Routing Platforms, and ACX4000 Universal Metro Routers.</p> <p>Command introduced in Junos OS Release 13.2 for MX104 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> <p>Command introduced in Junos OS Release 15.1X54-D20 for ACX5048 and ACX5096 Routers.</p> <p><b>satellite</b> option introduced in Junos OS Release 14.2R3.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.2 for PTX10008 Routers.</p> <p>Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.4 for MX204 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.3 for MX150 Router Appliance.</p> <p>Command introduced in Junos OS Release 18.1R1 for EX9251 switches.</p> <p>Command introduced in Junos OS Release 18.2 for EX9253 Switches.</p> <p>Command introduced in Junos OS Release 18.2 for MX10008 Universal Routing Platforms.</p>

**Description** On routers and switches, display the version levels of the firmware running on the System Control Board (SCB), Switching and Forwarding Module (SFM), System and Switch Board (SSB), Forwarding Engine Board (FEB), Flexible PIC Concentrators (FPCs), and Routing Engines. On a TX Matrix Plus router, display the version levels of the firmware running on the FPCs and the Switch Processor Mezzanine Board (SPMBs).

On EX2200, EX3200, EX4200, QFX Series, and OCX Series switches, display the version levels of the firmware running on the switch. On an EX8208 switch, display the version levels of the firmware running on the Switch Fabric and Routing Engine (SRE) modules and on the line cards (shown as FPCs). On an EX8216 switch, display the version levels of the firmware running on the Routing Engine (RE) modules and on the line cards (shown as FPCs).

**Options** **none**—Display the version levels of the firmware running. For an EX4200 switch that is a member of a Virtual Chassis, display version levels for all members. For a TX Matrix router, display version levels for the firmware on the TX Matrix router and on all the T640 routers connected to the TX Matrix router. For a TX Matrix Plus router, display version levels for the firmware on the TX Matrix Plus router and on all the routers connected to the TX Matrix Plus router.

**all-members**—(MX Series routers only) (Optional) Display the version levels of the firmware running for all members of the Virtual Chassis configuration.

**interconnect-device *name***—(QFabric systems) (Optional) Display the version levels of the firmware running on the Interconnect device.

**lcc *number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display version levels for the firmware on a specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display the version levels for the firmware on a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers only) (Optional) Display the version levels of the firmware running for the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Display the version levels of the firmware running for the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

**node-device**—(QFabric systems only) (Optional) Display the version levels of the firmware running on the Node device.

**satellite [*slot-id slot-id* | *device-alias alias-name*]**—(Junos Fusion only) (Optional) Display version levels of the firmware running for the specified satellite device or devices in a Junos Fusion, or for all satellite devices if no satellite devices are specified.

**scc**—(TX Matrix router only) (Optional) Display version levels for the firmware on the TX Matrix router (switch-card chassis).

**sfc *number***—(TX Matrix Plus router only) (Optional) Display version levels for the firmware on the TX Matrix Plus router (or switch-fabric chassis). Replace *number* with 0.

**detail**—(EX3200, EX3300, EX4200, and EX4500 standalone and Virtual Chassis member switches only) (Optional) Display version levels of the firmware running on the switch for its programmable hardware components.

**Required Privilege Level** view

**List of Sample Output**

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[show chassis firmware \(M20 Router\) on page 1652](#)  
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[show chassis firmware \(M120 Router\) on page 1652](#)  
[show chassis firmware \(M160 Router\) on page 1652](#)  
[show chassis firmware \(MX150\) on page 1653](#)  
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[show chassis firmware \(MX240 Router\) on page 1653](#)  
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[show chassis firmware lcc \(TX Matrix Router\) on page 1658](#)  
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[show chassis firmware lcc \(TX Matrix Plus Router\) on page 1660](#)  
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[show chassis firmware \(ACX500 Router\) on page 1663](#)

**Output Fields** [Table 137 on page 1651](#) lists the output fields for the show chassis firmware command. Output fields are listed in the approximate order in which they appear.

*Table 137: show chassis firmware Output Fields*

Field Name	Field Description
<b>Part</b>	(MX Series, MX2010, MX2020, and MX2008 routers) Chassis part name.
<b>Type</b>	(MX Series, MX2010, MX2020, and MX2008 routers) Type of firmware: On routers: ROM or O/S. On switches: uboot or loader.
<b>Version</b>	(MX Series, MX2010, MX2020, and MX2008 routers) Version of firmware running on the chassis part.
<b>FPC</b>	( <i>detail</i> option only) Number of FPC. For a standalone switch, the value is 0. For a Virtual Chassis configuration, value in the range of 0-9; refers to the member ID assigned to the switch.
<b>AFEB</b>	(MX104 routers) Version of the compact Forwarding Engine Board.
<b>Boot</b>	( <i>detail</i> option only) Version of the SYSPLD.
<b>PoE</b>	( <i>detail</i> option only) Version of the PoE firmware.
<b>PFE-&lt;number&gt;</b>	( <i>detail</i> option only) Version of the Packet Forwarding Engine used in the switch.
<b>PHY-</b>	( <i>detail</i> option only) Version of the physical layer device (PHY) used in the switch.
<b>microcode</b>	( <i>detail</i> option only) Microcode of the physical layer devices (PHY) used in the switch.
<b>uboot</b>	( <i>detail</i> option only) Version of the u-boot used in the switch.
<b>loader</b>	( <i>detail</i> option only) Version of the loader used in the switch.

## Sample Output

### show chassis firmware (M10 Router)

```
user@host> show chassis firmware
```

Part	Type	Version
Forwarding engine board	ROM	Juniper ROM Monitor Version 4.1b2
	O/S	Version 4.1I1 by usera on 2000-04-24 11:27

### show chassis firmware (M20 Router)

```
user@host> show chassis firmware
```

Part	Type	Version
System switch board	ROM	Juniper ROM Monitor Version 3.4b26
	O/S	Version 3.4I16 by userc on 2000-02-29 2
FPC 1	ROM	Juniper ROM Monitor Version 3.0b1
	O/S	Version 3.4I4 by userc on 2000-02-25 21
FPC 2	ROM	Juniper ROM Monitor Version 3.0b1
	O/S	Version 3.4I4 by userc on 2000-02-25 21

### show chassis firmware (M40 Router)

```
user@host> show chassis firmware
```

Part	Type	Version
System control board	ROM	Juniper ROM Monitor Version 2.0i126Copyri
	O/S	Version 2.0i1 by root on Thu Jul 23 00:51
FPC 5	ROM	Juniper ROM Monitor Version 2.0i49Copyrig
	O/S	Version 2.0i1 by root on Thu Jul 23 00:59

### show chassis firmware (M120 Router)

```
user@host> show chassis firmware
```

FPC 2	ROM	Juniper ROM Monitor Version 8.0b29
	O/S	Version 8.2B1 by userb on 2006-10-18 16:2
FPC 3	ROM	Juniper ROM Monitor Version 8.0b29
	O/S	Version 8.2B1 by userb on 2006-10-18 16:2
FPC 4	ROM	Juniper ROM Monitor Version 8.0b29
	O/S	Version 8.2B1 by userb on 2006-10-18 16:2
FEB 3	ROM	Juniper ROM Monitor Version 8.0b29
	O/S	Version 8.2B1 by userb on 2006-10-18 16:1
FEB 4	ROM	Juniper ROM Monitor Version 8.0b29
	O/S	Version 8.2B1 by userb on 2006-10-18 16:1

### show chassis firmware (M160 Router)

```
user@host> show chassis firmware
```

Part	Type	Version
SFM 0	ROM	Juniper ROM Monitor Version 4.0b2
	O/S	Version 4.0I1 by usera on 2000-02-29 11:50
SFM 1	ROM	Juniper ROM Monitor Version 4.0b2
	O/S	Version 4.0I1 by usera on 2000-02-29 11:50
FPC 0	ROM	Juniper ROM Monitor Version 4.0b2
	O/S	Version 4.0I1 by usera on 2000-02-29 11:56
FPC 1	ROM	Juniper ROM Monitor Version 4.0b2

FPC 2	O/S	Version 4.0I1 by usera on 2000-02-29 11:56
	ROM	Juniper ROM Monitor Version 4.0b3
	O/S	Version 4.0I1 by usera on 2000-02-29 11:56

### show chassis firmware (MX150)

```
user@host > show chassis firmware
```

Part	Type	Version
FPC	ROM	PC Bios
	O/S	Version 17.2I20170220_0929_rohitn by rohitn
on 2017-02-20 09:38:59 UTC		

### show chassis firmware (MX104 Router)

```
user@host > show chassis firmware
```

Part	Type	Version
FPC 0	ROM	Juniper ROM Monitor Version 13.1b24
	O/S	Version 13.2-20130514.1 by userb on 2013-
FPC 1	ROM	Juniper ROM Monitor Version 13.1b24
	O/S	Version 13.2-20130514.1 by userb on 2013-
FPC 2	ROM	Juniper ROM Monitor Version 13.1b24
	O/S	Version 13.2-20130514.1 by userb on 2013-
AFEB	ROM	Juniper ROM Monitor Version 13.1b24
	O/S	Version 13.2-20130514.1 by userb on 2013-

### show chassis firmware (MX240 Router)

```
user@host> show chassis firmware
```

Part	Type	Version
FPC 1	ROM	Juniper ROM Monitor Version 8.3b1
	O/S	Version 9.0-20080103.0 by userb on 2008-0
FPC 2	ROM	Juniper ROM Monitor Version 8.3b1
	O/S	Version 9.0-20080103.0 by userb on 2008-0

### show chassis firmware (MX480 Router)

```
user@host> show chassis firmware
```

Part	Type	Version
FPC 1	ROM	Juniper ROM Monitor Version 8.3b1
	O/S	Version 9.0-20070916.3 by userb on 2007-0

### show chassis firmware (MX960 Router)

```
user@host> show chassis firmware
```

Part	Type	Version
FPC 4	ROM	Juniper ROM Monitor Version 8.0b8
	O/S	Version 8.2I59 by user3 on 2006-10-31 19:22
FPC 7	ROM	Juniper ROM Monitor Version 8.2b1
	O/S	Version 8.2-20061026.1 by userb on 2006-1

### show chassis firmware (MX2010 Router)

```
user@host> show chassis firmware
```

Part	Type	Version
FPC 0	ROM	Juniper ROM Monitor Version 12.3b1
	O/S	Version 12.3-20121220.0 by userb on 2012-
FPC 1	ROM	Juniper ROM Monitor Version 10.1b3
	O/S	Version 12.3-20121220.0 by userb on 2012-
FPC 2	ROM	Juniper ROM Monitor Version 10.1b3
	O/S	Version 12.3-20121220.0 by userb on 2012-
FPC 3	ROM	Juniper ROM Monitor Version 10.1b3
	O/S	Version 12.3-20121220.0 by userb on 2012-
FPC 4	ROM	Juniper ROM Monitor Version 10.0b39
	O/S	Version 12.3-20121220.0 by userb on 2012-
FPC 5	ROM	Juniper ROM Monitor Version 10.0b39
	O/S	Version 12.3-20121220.0 by userb on 2012-
FPC 6	ROM	Juniper ROM Monitor Version 10.4b1
	O/S	Version 12.3-20121220.0 by userb on 2012-
FPC 7	ROM	Juniper ROM Monitor Version 10.1b3
	O/S	Version 12.3-20121220.0 by userb on 2012-
FPC 8	ROM	Juniper ROM Monitor Version 10.4b1
	O/S	Version 12.3-20121220.0 by userb on 2012-
FPC 9	ROM	Juniper ROM Monitor Version 10.4b1
	O/S	Version 12.3-20121220.0 by userb on 2012-
SPMB 0	ROM	Juniper ROM Monitor Version 12.1b1
	O/S	Version 12.3-20121220.0 by userb on 2012-
SPMB 1	ROM	Juniper ROM Monitor Version 12.1b1
	O/S	Version 12.3-20121220.0 by userb on 2012-

#### show chassis firmware (MX2020 Router)

```
user@host> show chassis firmware
```

Part	Type	Version
FPC 0	ROM	Juniper ROM Monitor Version 10.0b39
	O/S	Version 12.3-20130415.0 by userb on 2013-
FPC 1	ROM	Juniper ROM Monitor Version 10.0b39
	O/S	Version 12.3-20130415.0 by userb on 2013-
FPC 2	ROM	Juniper ROM Monitor Version 10.0b39
	O/S	Version 12.3-20130415.0 by userb on 2013-
FPC 3	ROM	Juniper ROM Monitor Version 10.0b39
	O/S	Version 12.3-20130415.0 by userb on 2013-
FPC 4	ROM	Juniper ROM Monitor Version 10.0b39
	O/S	Version 12.3-20130415.0 by userb on 2013-
FPC 5	ROM	Juniper ROM Monitor Version 10.0b39
	O/S	Version 12.3-20130415.0 by userb on 2013-
FPC 6	ROM	Juniper ROM Monitor Version 10.0b39
	O/S	Version 12.3-20130415.0 by userb on 2013-
FPC 7	ROM	Juniper ROM Monitor Version 10.0b39
	O/S	Version 12.3-20130415.0 by userb on 2013-
FPC 8	ROM	Juniper ROM Monitor Version 10.0b39
	O/S	Version 12.3-20130415.0 by userb on 2013-
FPC 9	ROM	Juniper ROM Monitor Version 10.0b39
	O/S	Version 12.3-20130415.0 by userb on 2013-
FPC 10	ROM	Juniper ROM Monitor Version 10.0b39
	O/S	Version 12.3-20130415.0 by userb on 2013-
FPC 11	ROM	Juniper ROM Monitor Version 10.0b39
	O/S	Version 12.3-20130415.0 by userb on 2013-
FPC 12	ROM	Juniper ROM Monitor Version 10.0b39
	O/S	Version 12.3-20130415.0 by userb on 2013-
FPC 13	ROM	Juniper ROM Monitor Version 10.0b39
	O/S	Version 12.3-20130415.0 by userb on 2013-
FPC 14	ROM	Juniper ROM Monitor Version 10.0b39



FPC 15	O/S	Version 12.3-20130415.0 by userb on 2013-
	ROM	Juniper ROM Monitor Version 10.0b39
FPC 16	O/S	Version 12.3-20130415.0 by userb on 2013-
	ROM	Juniper ROM Monitor Version 10.0b39
FPC 17	O/S	Version 12.3-20130415.0 by userb on 2013-
	ROM	Juniper ROM Monitor Version 10.0b39
FPC 18	O/S	Version 12.3-20130415.0 by userb on 2013-
	ROM	Juniper ROM Monitor Version 10.0b39
FPC 19	O/S	Version 12.3-20130415.0 by userb on 2013-
	ROM	Juniper ROM Monitor Version 10.0b39
SPMB 0	O/S	Version 12.3-20130415.0 by userb on 2013-
	ROM	Juniper ROM Monitor Version 12.1b1
SPMB 1	O/S	Version 12.3-20130415.0 by userb on 2013-
	ROM	Juniper ROM Monitor Version 12.1b1
	O/S	Version 12.3-20130415.0 by userb on 2013-

### show chassis firmware (MX2008 Router)

```
user@host> show chassis firmware
```

Part	Type	Version
FPC 0	ROM	Juniper ROM Monitor Version 10.1b3
	O/S	Version 17.2-20170412.0 by builder on
2017-04-12 01:15:48 UTC		
FPC 3	ROM	Juniper ROM Monitor Version 13.3b1
	O/S	Version 17.2-20170412.0 by builder on
2017-04-12 01:16:31 UTC		
FPC 5	ROM	Juniper ROM Monitor Version 13.3b1
	O/S	Version 17.2-20170412.0 by builder on
2017-04-12 01:16:31 UTC		
FPC 7	ROM	Juniper ROM Monitor Version 11.4b2
	O/S	Version 17.2-20170412.0 by builder on
2017-04-12 01:15:48 UTC		
FPC 9	ROM	Juniper ROM Monitor Version 13.2b1
	O/S	Version 17.2-20170412.0 by builder on
2017-04-12 01:15:58 UTC		

### show chassis firmware (MX10003)

```
user@host> show chassis firmware
```

Part	Type	Version
RE 0	PRI BIOS	CBEP_P_SUM0_00.11.01
	RE-FPGA	402
RE 1	PRI BIOS	CBEP_P_SUM0_00.11.01
	RE-FPGA	301
FPC 0	ROM	PC Bios
	O/S	Version 17.3-20170719.0 by builder on
2017-07-19 01:27:58 UTC		
FPC 1	ROM	PC Bios
	O/S	Version 17.3-20170719.0 by builder on
2017-07-19 01:27:58 UTC		

### show chassis firmware (MX204 Router)

```
user@host> show chassis firmware
```

Part	Type	Version
RE 0	PRI BIOS	CBEP_P_SUM1_00.11.01
	RE-FPGA	300
FPC	ROM	PC Bios
	O/S	Version 17.4I20171105_0609_aahluwalia by aahluwalia on 2017-11-05 06:09:28 UTC

### show chassis firmware (MX10008 Router)

```
user@host> show chassis firmware
```

Part	Type	Version
RE 0	PRI BIOS	CBEP_P_VAL0_00.14.1
	FPGA	264.0
	RE-FPGA	41.0
	RE-SSD1	SF-SBR12050
	RE-SSD2	SF-SBR12050
	i40e-NVM	6.01
RE 1	PRI BIOS	CBEP_P_VAL0_00.13.01
	FPGA	261.0
	RE-FPGA	41.0
	RE-SSD1	SF-SBR12034
	RE-SSD2	SF-SBR12034
	i40e-NVM	5.02
FPC 0	ROM	PC Bios
	O/S	Version 18.4-20180716_dev_common.0 by builder on 2018-07-16 00:43:35 UTC
	ROM Monitor	0 9.14.0
	PCIE Sw(0)	1.0.0
	MPCS(0)	0.2.0
	I2CS CPLD	0.4.0
	BOOT CPLD	0.4.0
FPC 2	ROM	PC Bios
	O/S	Version 18.4-20180716_dev_common.0 by builder on 2018-07-16 00:43:35 UTC
	ROM Monitor	0 9.14.0
	PCIE Sw(0)	1.0.0
	MPCS(0)	0.2.0
	I2CS CPLD	0.4.0
	BOOT CPLD	0.4.0
FPC 3	ROM	PC Bios
	O/S	Version 18.4-20180716_dev_common.0 by builder on 2018-07-16 00:43:35 UTC
	ROM Monitor	0 9.14.0
	PCIE Sw(0)	1.0.0
	MPCS(0)	0.4.0
	I2CS CPLD	0.8.0
	BOOT CPLD	0.8.0
FPM	FPGA	1.9
FTC 0	FPGA	2.0
FTC 1	FPGA	2.0
SFB 0	FPGA	3.0
SFB 1	FPGA	3.0
SFB 2	FPGA	3.0
SFB 3	FPGA	3.0
SFB 4	FPGA	3.0
SFB 5	FPGA	3.0

**show chassis firmware (MX240, MX480, MX960 Router with Application Services Modular Line Card)**

```
user@host> show chassis firmware
```

Part	Type	Version
FPC 1	ROM	Juniper ROM Monitor Version 12.1b1
	O/S	Version 12.2I21 by user1 on 2012-06-19 17:

**show chassis firmware (EX4200 Switch)**

```
user@switch> show chassis firmware
```

Part	Type	Version
FPC 0	uboot	U-Boot 1.1.6 (Feb 6 2008 - 11:27:42)
	loader	FreeBSD/PowerPC U-Boot bootstrap loader 2.1
FPC 1	uboot	U-Boot 1.1.6 (Feb 6 2008 - 11:27:42)
	loader	FreeBSD/PowerPC U-Boot bootstrap loader 2.1
FPC 2	uboot	U-Boot 1.1.6 (Feb 6 2008 - 11:27:42)
	loader	FreeBSD/PowerPC U-Boot bootstrap loader 2.1

**show chassis firmware (EX8200 Switch)**

```
user@switch> show chassis firmware
```

Part	Type	Version
FPC 0	U-Boot	U-Boot 1.1.6 (Mar 25 2009 - 06:13:12) 2.4.0
	loader	FreeBSD/PowerPC U-Boot bootstrap loader 2.2
FPC 3	U-Boot	U-Boot 1.1.6 (Dec 4 2009 - 13:17:34) 3.1.0
	loader	FreeBSD/PowerPC U-Boot bootstrap loader 2.2
FPC 5	U-Boot	U-Boot 1.1.6 (Mar 25 2009 - 06:13:12) 2.4.0
	loader	FreeBSD/PowerPC U-Boot bootstrap loader 2.2
FPC 7	U-Boot	U-Boot 1.1.6 (Feb 6 2009 - 05:31:46) 2.4.0
	loader	FreeBSD/PowerPC U-Boot bootstrap loader 2.2
Routing Engine 0	U-Boot	U-Boot 1.1.6 (Mar 25 2009 - 06:13:12) 2.4.0
	loader	FreeBSD/PowerPC U-Boot bootstrap loader 2.2
Routing Engine 1	U-Boot	U-Boot 1.1.6 (Mar 25 2009 - 06:13:12) 2.4.0
	loader	FreeBSD/PowerPC U-Boot bootstrap loader 2.2

**show chassis firmware (EX9200 Switch)**

```
user@switch> show chassis firmware
```

Part	Type	Version
FPC 2	ROM	Juniper ROM Monitor Version 11.4b2
	O/S	Version 14.1I20140312_0741 by userd o
FPC 3	ROM	Juniper ROM Monitor Version 10.4b1
	O/S	Version 14.1I20140312_0741 by userd o

**show chassis firmware (EX9251 Switch)**

```
user@switch> show chassis firmware
```

Part	Type	Version
RE 0	PRI BIOS	CBEP_P_SUM1_00.11.01

```

FPC                                RE-FPGA  301
                                ROM          PC Bios
                                O/S          Version 18.1R1.4 by builder on 2018-03-06
00:31:54 UTC

```

### show chassis firmware (EX9253 Switch)

```

user@switch> show chassis firmware
Part      Type      Version
RE 0      PRI BIOS  CBEP_P_SUM1_00.11.01
           RE-FPGA  402
RE 1      PRI BIOS  CBEP_P_SUM1_00.11.01
           RE-FPGA  402
FPC 0      ROM      PC Bios
           O/S      Version 18.2-20180129_dev_common.1 by builder
           on 2018-01-29 13:35:11 UTC
FPC 1      ROM      PC Bios
           O/S      Version 18.2-20180129_dev_common.1 by builder
           on 2018-01-29 13:35:11 UTC

```

### show chassis firmware lcc (TX Matrix Router)

```

user@host> show chassis firmware lcc 0
lcc0-re0:
-----
Part      Type      Version
FPC 1      ROM      Juniper ROM Monitor Version 6.4b18
           O/S      Version 7.0-20040804.0 by userb on 2004-0
FPC 2      ROM      Juniper ROM Monitor Version 6.4b20
           O/S      Version 7.0-20040804.0 by userb on 2004-0
SPMB 0      ROM      Juniper ROM Monitor Version 6.4b18
           O/S      Version 7.0-20040804.0 by userb on 2004-0

```

### show chassis firmware scc (TX Matrix Router)

```

user@host> show chassis firmware scc
scc-re0:
-----
Part      Type      Version
SPMB 0      ROM      Juniper ROM Monitor Version 6.4b18
           O/S      Version 7.0-20040804.0 by userb on 2004-0

```

### show chassis firmware (TX Matrix Plus Router)

```

user@host> show chassis firmware
sfc0-re0:
-----
Part      Type      Version
Global FPC 4
Global FPC 6
Global FPC 7
Global FPC 12
Global FPC 14
Global FPC 15
Global FPC 20

```

```

Global FPC 21
Global FPC 22
Global FPC 23
Global FPC 24
Global FPC 25
Global FPC 26
Global FPC 28
Global FPC 29
Global FPC 31
SPMB 0          ROM      Juniper ROM Monitor Version 9.5b1
                  O/S      Version 9.6-20090507.0 by userb on 2009-0
SPMB 1          ROM      Juniper ROM Monitor Version 9.5b1
                  O/S      Version 9.6-20090507.0 by userb on 2009-0

```

```
lcc0-re1:
```

```

-----
Part          Type      Version
FPC 4          ROM      Juniper ROM Monitor Version 9.0b2
                  O/S      Version 9.6-20090507.0 by userb on 2009-0
FPC 6          ROM      Juniper ROM Monitor Version 9.0b2
                  O/S      Version 9.6-20090507.0 by userb on 2009-0
FPC 7          ROM      Juniper ROM Monitor Version 9.0b2
                  O/S      Version 9.6-20090507.0 by userb on 2009-0
SPMB 0          ROM      Juniper ROM Monitor Version 9.5b1
                  O/S      Version 9.6-20090507.0 by userb on 2009-0
SPMB 1          ROM      Juniper ROM Monitor Version 9.5b1
                  O/S      Version 9.6-20090507.0 by userb on 2009-0

```

```
lcc1-re1:
```

```

-----
Part          Type      Version
FPC 4          ROM      Juniper ROM Monitor Version 9.0b2
                  O/S      Version 9.6-20090507.0 by userb on 2009-0
FPC 6          ROM      Juniper ROM Monitor Version 9.0b2
                  O/S      Version 9.6-20090507.0 by userb on 2009-0
FPC 7          ROM      Juniper ROM Monitor Version 9.0b2
                  O/S      Version 9.6-20090507.0 by userb on 2009-0
SPMB 0          ROM      Juniper ROM Monitor Version 9.5b1
                  O/S      Version 9.6-20090507.0 by userb on 2009-0
SPMB 1          ROM      Juniper ROM Monitor Version 9.5b1
                  O/S      Version 9.6-20090507.0 by userb on 2009-0

```

```
lcc2-re1:
```

```

-----
Part          Type      Version
FPC 4          ROM      Juniper ROM Monitor Version 9.0b2
                  O/S      Version 9.6-20090507.0 by userb on 2009-0
FPC 5          ROM      Juniper ROM Monitor Version 9.0b2
                  O/S      Version 9.6-20090507.0 by userb on 2009-0
FPC 6          ROM      Juniper ROM Monitor Version 9.0b2
                  O/S      Version 9.6-20090507.0 by userb on 2009-0
FPC 7          ROM      Juniper ROM Monitor Version 7.5b4
                  O/S      Version 9.6-20090507.0 by userb on 2009-0
SPMB 0          ROM      Juniper ROM Monitor Version 9.5b1
                  O/S      Version 9.6-20090507.0 by userb on 2009-0
SPMB 1          ROM      Juniper ROM Monitor Version 9.5b1
                  O/S      Version 9.6-20090507.0 by userb on 2009-0

```

```
lcc3-re1:
```

Part	Type	Version
FPC 0	ROM	Juniper ROM Monitor Version 9.0b2
	O/S	Version 9.6-20090507.0 by userb on 2009-0
FPC 1	ROM	Juniper ROM Monitor Version 9.0b2
	O/S	Version 9.6-20090507.0 by userb on 2009-0
FPC 2	ROM	Juniper ROM Monitor Version 9.0b2
	O/S	Version 9.6-20090507.0 by userb on 2009-0
FPC 4	ROM	Juniper ROM Monitor Version 7.5b4
	O/S	Version 9.6-20090507.0 by userb on 2009-0
FPC 5	ROM	Juniper ROM Monitor Version 9.0b2
	O/S	Version 9.6-20090507.0 by userb on 2009-0
FPC 7	ROM	Juniper ROM Monitor Version 9.0b2
	O/S	Version 9.6-20090507.0 by userb on 2009-0
SPMB 0	ROM	Juniper ROM Monitor Version 9.5b1
	O/S	Version 9.6-20090507.0 by userb on 2009-0
SPMB 1	ROM	Juniper ROM Monitor Version 9.5b1
	O/S	Version 9.6-20090507.0 by userb on 2009-0

### show chassis firmware lcc (TX Matrix Plus Router)

```
user@host> show chassis firmware lcc 0
```

```
lcc0-re1:
```

Part	Type	Version
FPC 4	ROM	Juniper ROM Monitor Version 9.0b2
	O/S	Version 9.6-20090507.0 by userb on 2009-0
FPC 6	ROM	Juniper ROM Monitor Version 9.0b2
	O/S	Version 9.6-20090507.0 by userb on 2009-0
FPC 7	ROM	Juniper ROM Monitor Version 9.0b2
	O/S	Version 9.6-20090507.0 by userb on 2009-0
SPMB 0	ROM	Juniper ROM Monitor Version 9.5b1
	O/S	Version 9.6-20090507.0 by userb on 2009-0
SPMB 1	ROM	Juniper ROM Monitor Version 9.5b1
	O/S	Version 9.6-20090507.0 by userb on 2009-0

### show chassis firmware sfc (TX Matrix Plus Router)

```
user@host> show chassis firmware sfc 0
```

```
sfc0-re0:
```

Part	Type	Version
Global FPC 4		
Global FPC 6		
Global FPC 7		
Global FPC 12		
Global FPC 14		
Global FPC 15		
Global FPC 20		
Global FPC 21		
Global FPC 22		
Global FPC 23		
Global FPC 24		
Global FPC 25		
Global FPC 26		
Global FPC 28		
Global FPC 29		
Global FPC 31		

SPMB 0	ROM	Juniper ROM Monitor Version 9.5b1
	O/S	Version 9.6-20090507.0 by userb on 2009-0
SPMB 1	ROM	Juniper ROM Monitor Version 9.5b1
	O/S	Version 9.6-20090507.0 by userb on 2009-0

### show chassis firmware (QFX Series and OCX Series)

```
user@switch> show chassis firmware
```

Part	Type	Version
FPC 0		
Routing Engine 0	U-Boot loader	U-Boot 1.1.6 (Sep 15 2010 - 02:11:11) 1.0.5 FreeBSD/MIPS U-Boot bootstrap loader 0.1

### show chassis firmware (PTX1000 Packet Transport Routers)

```
user@host> show chassis firmware
```

Part	Type	Version
FPC 0	U-Boot loader	*** FreeBSD/i386 bootstrap loader 1.2
	BIOS	V0018.2U
	EC FPGA	2.0
	MAIN_CPLD	1.f
	MEZZ_CPLD	1.f
	RE FPGA	2.3

### show chassis firmware (PTX10008 Routers)

```
user@host> show chassis firmware
```

Part	Type	Version
RE 0	PRI BIOS	QFXS_SFP_00.31_01.01
	GDN BIOS	QFXS_SFP_00.31_01.01
	FPGA	2.4
	RE-FPGA	3.2
RE 1	PRI BIOS	QFXS_SFP_00.31_01.01
	GDN BIOS	QFXS_SFP_00.31_01.01
	FPGA	2.3
	RE-FPGA	3.2
FPC 0 - 22:56:52)	U-Boot	Bank A: U-Boot 2011.12-gfbea47a (Feb 26 2016)
	CTRL FPGA	4.1
	PORT FPGA	2.0
FPC 5 - 22:56:52)	U-Boot	Bank A: U-Boot 2011.12-gfbea47a (Feb 26 2016)
	CTRL FPGA	3.1
	PORT FPGA	2.0
FPC 6 - 22:56:52)	U-Boot	Bank B: U-Boot 2011.12-gfbea47a (Feb 26 2016)
	CTRL FPGA	3.1
	PORT FPGA	2.0
FPM	FPGA	1.9
FTC 0	FPGA	2.0
FTC 1	FPGA	2.0
SIB 0	FPGA	3.0
SIB 1	FPGA	3.0

**show chassis firmware interconnect-device (QFabric System)**

```
user@switch> show chassis firmware interconnect-device interconnect1
```

Part	Type	Version
Routing Engine 0	U-Boot loader	U-Boot 1.1.6 (May 10 2011 - 04:52:59) 1.1.1 FreeBSD/MIPS U-Boot bootstrap loader 0.1
Routing Engine 1	U-Boot loader	U-Boot 1.1.6 (May 10 2011 - 04:52:59) 1.1.1 FreeBSD/MIPS U-Boot bootstrap loader 0.1

**show chassis firmware (ACX2000 Universal Metro Router)**

```
user@switch> show chassis firmware
```

Part	Type	Version
FPC	O/S	Version 12.2I13 by user2 on 2012-05-29 06:
FEB	O/S	Version 12.2I13 by user2 on 2012-05-29 06:

**show chassis firmware detail (EX3300 Switch)**

```
user@switch> show chassis firmware detail
```

FPC 0		
Boot SYSPLD	3	
PoE firmware	4.1.6	
PFE-0	3	
PFE-1	3	
PHY		
microcode	0x514	
Boot Firmware		
uboot loader	U-Boot 1.1.6 (Aug 21 2011 - 01:45:26)	1.0.0 FreeBSD/arm U-Boot loader 1.0

**show chassis firmware (MX Routers with Media Services Blade [MSB])**

```
user@switch> show chassis firmware
```

Part	Type	Version
FPC 1	ROM	Juniper ROM Monitor Version 12.1b1
	O/S	Version 12.2I21 by user1 on 2012-06-19 17:

**show chassis firmware (ACX5048 Router)**

```
user@host> show chassis firmware
```

Part	Type	Version
FPC	loader	FreeBSD/i386 bootstrap loader 1.2
	BIOS	V0018.7
	TMC FPGA	6.d8
	PICO CPLD0	7.b
	PICO CPLD1	7.b
	PICO CPLD2	7.b
	PICO CPLD3	7.b
	PICO CPLD4	7.b
	PICO CPLD5	7.b
	PICO CPLD6	6.a
	MRE	17.9
	Power CPLD	3.a



## show chassis firmware (ACX5096 Router)

user@host&gt; show chassis firmware

Part	Type	Version
FPC	loader	FreeBSD/i386 bootstrap loader 1.2
	BIOS	V0018.7
	TMC FPGA	3000001.5
	PIC0 CPLD0	7.b
	PIC0 CPLD1	7.b
	PIC0 CPLD2	7.b
	PIC0 CPLD3	7.b
	PIC0 CPLD4	7.b
	PIC0 CPLD5	7.b
	PIC0 CPLD6	c6.a
	PIC0 CPLD7	-NA-
	PIC0 CPLD8	7.b
	PIC0 CPLD9	7.b
	PIC0 CPLD10	7.b
	PIC0 CPLD11	7.b
	PIC0 CPLD12	7.b
	PIC0 CPLD13	7.b
	PIC0 CPLD14	c6.a
	MRE	7.5
	Power CPLD	4.1

## show chassis firmware (ACX500 Router)

user@host&gt; show chassis firmware

Part	Type	Version
FPC	O/S	Version 15.2-20150815_dev_rbu_1_16q1.0 by
userb on 2015-08-15 04:18:02 UTC		
FEB	O/S	Version 15.2-20150815_dev_rbu_1_16q1.0 by
userb on 2015-08-15 04:18:02 UTC		

## show chassis forwarding

<b>Syntax</b>	show chassis forwarding
<b>Release Information</b>	Current—Command introduced before Junos OS Release 7.4. Now—Command introduced in Junos OS Release 7.4. Support for Branch SRX Series added in Junos OS Release 10.1
<b>Description</b>	Display status of the forwarding process (fwdd). This command is supported on Branch SRX Series Services Gateways.
<b>Options</b>	This command has no options.
<b>Required Privilege Level</b>	view
<b>List of Sample Output</b>	<a href="#">show chassis forwarding on page 1664</a>
<b>Output Fields</b>	<a href="#">Table 138 on page 1664</a> lists the output fields for the <b>show chassis forwarding</b> command. Output fields are listed in the approximate order in which they appear.

*Table 138: show chassis forwarding Output Fields*

Field Name	Field Description
<b>FWWD status</b>	<p>Forwarding status:</p> <ul style="list-style-type: none"> <li>• <b>State:</b> <ul style="list-style-type: none"> <li>• <b>Online</b>—FWDD is operational and running.</li> <li>• <b>Offline</b>—FWDD is not running.</li> </ul> </li> <li>• <b>Microkernel CPU utilization</b>—Percentage of microkernel CPU being used by the forwarding process.</li> <li>• <b>Real-time threads CPU utilization</b>—Percentage of CPU being used by the forwarding process.</li> <li>• <b>Heap utilization</b>—Percentage of heap space (dynamic memory) being used by the forwarding process. If this number exceeds 80 percent, there may be a software problem (memory leak).</li> <li>• <b>Buffer utilization</b>—Percentage of buffer space being used by the forwarding process for buffering internal messages.</li> <li>• <b>Uptime</b>—How long the forwarding process has been up and running.</li> </ul>

## Sample Output

### show chassis forwarding

```

user@host> show chassis forwarding

FWDD status:
  State                Online
  Microkernel CPU utilization  10 percent
  Real-time threads CPU utilization  4 percent

```

Heap utilization	26 percent
Buffer utilization	0 percent
Uptime:	1 day, 1 hour, 30 minutes, 11 seconds

## show chassis fpc

---

- List of Syntax**
- Syntax on page 1666
  - Syntax (EX Series Switches) on page 1666
  - Syntax (T4000 Routers) on page 1666
  - Syntax (TX Matrix and TX Matrix Plus Routers) on page 1666
  - Syntax (MX Series Routers and EX Series switches) on page 1666
  - Syntax (MX104, MX204, MX2010, MX2020, MX10003, and MX2008 Universal Routing Platforms) on page 1666
  - Syntax (MX10008 Universal Routing Platforms) on page 1667
  - Syntax (QFX Series) on page 1667
  - Syntax (OCX Series) on page 1667
  - Syntax (PTX Series Packet Transport Routers) on page 1667
  - Syntax (ACX Series Universal Metro Routers) on page 1667
  - Syntax (ACX500 Routers) on page 1667

**Syntax**      `show chassis fpc`  
`<detail <slot>> | <pic-status <slot>>`

**Syntax (EX Series Switches)**      `show chassis fpc`  
`<detail <fpc-slot>> | <pic-status <fpc-slot>>`  
`<fpc-slot>`

**Syntax (T4000 Routers)**      `show chassis fpc`  
`<detail <fpc-slot>>`  
`<pic-status <fpc-slot>>`

**Syntax (TX Matrix and TX Matrix Plus Routers)**      `show chassis fpc`  
`<detail <fpc-slot>> | <pic-status <fpc-slot>>`  
`<slot>`

**Syntax (MX Series Routers and EX Series switches)**      `show chassis fpc`  
`<detail <slot>> | <pic-status <slot>>`  
`<all-members>`  
`<local>`  
`<member member-id>`

**Syntax (MX104, MX204, MX2010, MX2020, MX10003, and MX2008 Universal Routing Platforms)**      `show chassis fpc`  
`<slot> detail | <detail <slot>> | <pic-status <slot>>`  
`<fpc-slot>`

Syntax (MX10008 Universal Routing Platforms)	<pre>show chassis fpc &lt;detail&gt; &lt;errors&gt; &lt;fpc-slot&gt; pic-status &lt;fpc-slot&gt;</pre>
Syntax (QFX Series)	<pre>show chassis fpc &lt;detail&gt; &lt;interconnect-device name &lt;fpc-slot fpc-slot&gt;&gt; &lt;node-device name&gt;</pre>
Syntax (OCX Series)	<pre>show chassis fpc &lt;detail&gt;</pre>
Syntax (PTX Series Packet Transport Routers)	<pre>show chassis fpc &lt;detail &lt;fpc-slot&gt;&gt;   &lt;pic-status &lt;fpc-slot&gt;&gt; &lt;fpc-slot&gt;</pre>
Syntax (ACX Series Universal Metro Routers)	<pre>show chassis fpc &lt;detail &lt;fpc-slot&gt;&gt;   &lt;pic-status &lt;fpc-slot&gt;&gt; &lt;fpc-slot&gt;</pre>
Syntax (ACX500 Routers)	<pre>show chassis fpc &lt;fpc-slot&gt; detail &lt;fpc-slot&gt; pic-status &lt;fpc-slot&gt;</pre>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for QFX Series.</p> <p>Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.</p> <p>Command introduced in Junos OS Release 12.2 for ACX Series Universal Metro Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 13.2 for MX104 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.2 for PTX10008 Routers.</p> <p>Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.3 for MX150 Router Appliance.</p> <p>Command introduced in Junos OS Release 17.4 for MX204 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 18.1R1 for EX9251 switch.</p> <p>Command introduced in Junos OS Release 18.2 for EX9253 Switches.</p>

**Description** Display status information about the installed Flexible PIC Concentrators (FPCs) and PICs.

**Options** **none**—Display status information for all FPCs. On a TX Matrix router, display status information for all FPCs on the attached T640 routers in the routing matrix. On a TX Matrix Plus router, display status information for all FPCs on the attached routers in the routing matrix.



**NOTE:** In EX8200 switches, line cards initialize Packet Forwarding Engine during startup. If an error occurs during hardware initialization, the FPCs with bad hardware parts power down after transferring the debug information to the Routing Engine. The Routing Engine marks the FPC offline, logs the error in system log messages (/var/log/messages), and generates an alarm to inform the user.

See the following sample output:

```
user@host> show chassis fpc
```

Utilization (%)	Temp	CPU	Utilization (%)	Memory
Slot State	(C)	Total	Interrupt	DRAM (MB) Heap
Buffer				
0 Empty				
1 Empty				
2 Empty				
3 Empty				
4 Empty				
5 Offline				
6 Empty				
7 Online	26	4	0	1024 0
32				

---Hard FPC error---

The following sample output shows the alarm raised for the failed FPCs:

```
user@host> show chassis alarms
```

Alarm time	Class	Description
4 alarms currently active		
2011-03-24 00:52:51 UTC	Major	FPC 5 Hard errors
2011-03-24 00:52:31 UTC	Major	Fan Tray Failure
2011-03-24 00:52:31 UTC	Major	Fan Tray Failure
2011-03-24 00:51:26 UTC	Minor	Loss of communication with Backup RE



**NOTE:** On T4000 routers, when you include the enhanced-mode statement at the [edit chassis network-services] hierarchy level and reboot the system, only the T4000 Type 5 FPCs present on the router become online while the remaining FPCs are offline, and FPC misconfiguration alarms are generated. The show chassis alarm command output displays FPC misconfiguration (FPC *fpc-slot* misconfig) as the reason for the generation the alarms.

The following sample output shows the FPC status after the enhanced-mode statement is configured on the T4000 router. The T4000 Type 5 FPC present in slot 5 becomes online while the remaining FPCs are offline.

```
user@host> show chassis fpc
Utilization (%)      Temp  CPU Utilization (%)  Memory
Slot State          (C)  Total  Interrupt             DRAM (MB) Heap
Buffer
0  offline          ---FPC misconfiguration---
1  offline          ---FPC misconfiguration---
2  offline          ---FPC misconfiguration---
3  Empty
4  Empty
5  Online           66     50      0        2816      29
27
```

The following sample output shows FPC misconfiguration alarms:

```
user@host> show chassis alarms
3 alarms currently active
Alarm time          Class  Description
2011-03-24 00:52:51 PST  Major  FPC 1 misconfig
2011-03-24 00:52:31 PST  Major  FPC 2 misconfig
2011-03-24 00:52:31 PST  Major  FPC 3 misconfig
```

**detail**—(Optional) Display detailed status information for all FPCs or for the FPC in the specified slot (see *fpc-slot* or *slot*).

**all-members**—(MX Series routers and EX Series switches only) (Optional) Display status information for all FPCs on all members of the Virtual Chassis configuration.

**interconnect-device *name***—(QFabric systems only) (Optional) Display status information for all FPCs on the Interconnect device.

***fpc-slot***—(Optional) FPC slot number:

- (TX Matrix and TX Matrix Plus routers only)—On a TX Matrix router, if you specify the number of the T640 router (line-card chassis) by using the *lcc number* option

(the recommended method), replace **fpc-slot** with a value from 0 through 7. Otherwise, replace **fpc-slot** with a value from 0 through 31. Likewise, on a TX Matrix Plus router, if you specify the number of the specified router (line-card chassis) by using the **lcc number** option (the recommended method), replace **fpc-slot** with a value from 0 through 7. Otherwise, replace **fpc-slot** with a value from 0 through 31. For example, the following commands have the same result:

```
user@host> show chassis fpc detail 1 lcc 1
user@host> show chassis fpc detail 9
```

- M120 router—Replace **fpc-slot** with a value from 0 through 5.
- MX80 router—Replace **fpc-slot** with a value from 0 through 1.
- MX104 and MX104-40G routers—Replace **fpc-slot** with a value from 0 through 2.
- MX240 router—Replace **fpc-slot** with a value from 0 through 2.
- MX480 router—Replace **fpc-slot** with a value from 0 through 5.
- MX-960 router—Replace **fpc-slot** with a value from 0 through 11.
- MX2010 router—Replace **fpc-slot-number** with a value from 0 through 9.
- MX2008 router—Replace **fpc-slot-number** with a value from 0 through 9.
- MX2020 router—Replace **fpc-slot-number** with a value from 0 through 19.
- Other routers—Replace **fpc-slot** with a value from 0 through 7.
- EX Series switches:
  - EX3200 switches and EX4200 standalone switches—Replace **fpc-slot** with 0.
  - EX4200 switches in a Virtual Chassis configuration—Replace **fpc-slot** with a value from 0 through 9.
  - EX6210 switches—Replace **fpc-slot** with a value from 0 through 9.
  - EX8208 switches—Replace **fpc-slot** with a value from 0 through 7.
  - EX8216 switches—Replace **fpc-slot** with a value from 0 through 15.
  - EX9204 switches—Replace **fpc-slot** with a value from 0 through 2.
  - EX9208 switches—Replace **fpc-slot** with a value from 0 through 5.
  - EX9214 switches—Replace **fpc-slot** with a value from 0 through 11.
- QFX Series:
  - QFXSeries and OCX Series switches—Replace **fpc-slot** with 0.
  - QFabric systems—Replace **fpc-slot** with 0 through 31 on the Interconnect device.
- PTX Series Packet Transport Routers:



- PTX5000 Packet Transport Router—Replace **fpc-slot** with a value from 0 through 7.
- ACX Series Universal Metro Routers:
  - ACX1000 and ACX2000 Universal Metro Routers—Replace **fpc-slot** with 0.

**local**—(MX Series routers and EX Series switches only) (Optional) Display status information for all FPCs on the local Virtual Chassis member.

**member member-id**—(MX Series routers and EX Series switches only) (Optional) Display status information for all FPCs on the specified member of the Virtual Chassis configuration. Replace **member-id** with a value of 0 or 1.

**node-device name**—(QFabric systems only) (Optional) Display status information for each Node device. Each Node device is equivalent to an FPC.

**pic-status**—(Optional) Display status information for all PICs or for the PIC in the specified slot (see **fpc-slot**).



**NOTE:** On T1600 routers, Type 4 FPCs with ASICs based on the SL2.0 chipset do not support the 10-Gigabit Ethernet LAN/WAN PIC with SFP+ (10x10GE [LAN/WAN] SFPP). If you issue the `show chassis fpc` command with the `pic-status` option, the CLI displays the string “Not Supported” for 10x10GE (LAN/WAN) SFPP PICs installed on such FPCs. The following is a sample output:

```
user@host> show chassis fpc pic-status
Slot 0  Online      E2-FPC Type 1
  PIC 0  Online      1x G/E SFP, 1000 BASE
  PIC 1  Online      Adaptive Services-II
  PIC 2  Online      1x G/E IQ, 1000 BASE
  PIC 3  Online      1x G/E IQ, 1000 BASE
Slot 1  Online      FPC Type 3-ES
  PIC 0  Present     UNUSED- Not Supported
Slot 2  Online      FPC Type 4-ES
  PIC 0  Offline     4x OC-192 SONET XFP
  PIC 1  Present     10x10GE (LAN/WAN) SFPP- Not Supported
<<<<<<
Slot 4  Offline     FPC Type 1-ES
Slot 5  Offline     FPC Type 2-ES
Slot 6  Online      E2-FPC Type 3
  PIC 0  Online      1x OC-192 SONET XFP
  PIC 1  Online      4x OC-48 SONET
  PIC 2  Online      4x OC-48 SONET
  PIC 3  Online      MultiServices 500
Slot 7  Online      FPC Type 4-ES
  PIC 0  Online      4x 10GE (LAN/WAN) XFP
  PIC 1  Online      4x 10GE (LAN/WAN) XFP
```

In addition, an entry is logged in the system log messages (/var/log/messages) that the PIC is not supported. The following is a sample message logged in the system log:

```
Apr  5 08:47:36  router1 chassisd[2770]: CHASSISD_UNSUPPORTED_PIC:
PIC 1 in FPC 2 (type 763, version 257) is not supported
```

If you see this issue, contact Juniper Networks Technical Assistance Center (JTAC) for a possible fix. For more information about this issue and a possible solution, see [PSN-2010-03-696](#).



**NOTE:** When there is a double-bit ECC error in a network processor's memory, the Channelized OC3/STM1 (Multi-Rate) Circuit Emulation MIC with SFP or Channelized E1/T1 Circuit Emulation MIC is switched to the offline state.

```
user@host> show chassis fpc pic-status
```

```
Slot 1   Online      MPC Type 2 3D Q
PIC 0   Offline      1xC0C12/4xC0C3 CH-CE- ECC error detected
```

**lcc *number***—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**Required Privilege Level** view

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  - [show chassis fpc-feb-connectivity on page 1723](#)
  - [show chassis fabric fpcs on page 1412](#)
  - [Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 479](#)
  - [MX960 Flexible PIC Concentrator Description](#)
  - [ACX2000 and ACX2100 Routers Hardware and CLI Terminology Mapping](#)
  - [enhanced-mode on page 639](#)

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**Output Fields** Table 139 on page 1676 lists the output fields for the **show chassis fpc** command. Output fields are listed in the approximate order in which they appear.

*Table 139: show chassis fpc Output Fields*

Field Name	Field Description	Level of Output
<b>Slot</b> or <b>Slot State</b>	Slot number and state. The state can be one of the following conditions: <ul style="list-style-type: none"> <li>• <b>Dead</b>—Held in reset because of errors.</li> <li>• <b>Diag</b>—Slot is being ignored while the FPC is running diagnostics.</li> <li>• <b>Dormant</b>—Held in reset.</li> <li>• <b>Empty</b>—No FPC is present.</li> <li>• <b>Offline</b>—(PTX Series Packet Transport Routers only) One of the following two states is displayed: <ul style="list-style-type: none"> <li>• <b>FPC offlined due to unreachable destinations</b></li> <li>• <b>FPC Offlined due to degraded FPC action</b></li> </ul> </li> <li>• <b>Online</b>—FPC is online and running.</li> <li>• <b>Present</b>—FPC is detected by the chassis daemon but either is not supported by the current version of Junos OS or is inserted in the wrong slot. The output also states either <b>Hardware Not Supported</b> or <b>Hardware Not In Right Slot</b>. The FPC is coming up but not yet online.</li> <li>• <b>Probed</b>—Probe is complete; awaiting restart of the Packet Forwarding Engine.</li> <li>• <b>Probe-wait</b>—Waiting to be probed.</li> </ul>	all levels
<b>Logical slot</b>	Slot number.	all levels
<b>Temp (C) or Temperature</b>	Temperature of the air passing by the FPC, in degrees Celsius or in both Celsius and Fahrenheit.	all levels all levels
<b>Temperature (PTX Series)</b>	On PTX Series Packet Transport Routers, temperature details are provided in degrees Celsius and Fahrenheit. Output includes: <ul style="list-style-type: none"> <li>• Temperature (PMB)—Temperature of the air passing by the Processor Mezzanine Board (PMB) at the bottom of the FPC.</li> <li>• Temperature (Intake)—Temperature of the air flowing into the chassis.</li> <li>• Temperature (Exhaust)—Exhaust temperatures for multiple zones (Exhaust A and Exhaust B).</li> <li>• Temperature (TLn)—Temperature of the specified Lookup ASIC (TL) of the packet forwarding engine on the FPC.</li> <li>• Temperature (TQn)—Temperature of the specified Queuing and Memory Interface ASIC (TQ) of the packet forwarding engine on the FPC.</li> </ul>	detail
<b>Total CPU Utilization (%)</b>	Total percentage of CPU being used by the FPC's processor.	all levels
<b>Interrupt CPU Utilization (%)</b>	Of the total CPU being used by the FPC's processor, the percentage being used for interrupts.	none specified

Table 139: show chassis fpc Output Fields (continued)

Field Name	Field Description	Level of Output
<b>1 min CPU utilization (%)</b>  <i>NOTE:</i> Supported only on MX240, MX480, MX960, MX2010, MX2020, and MX2008.	Information about the Routing Engine's CPU utilization in the past 1 minute.	none specified
<b>5 min CPU utilization (%)</b>  <i>NOTE:</i> Supported only on MX240, MX480, MX960, MX2010, MX2020, and MX2008.	Information about the Routing Engine's CPU utilization in the past 5 minutes.	none specified
<b>15 min CPU utilization (%)</b>  <i>NOTE:</i> Supported only on MX240, MX480, MX960, MX2010, MX2020, and MX2008.	Information about the Routing Engine's CPU utilization in the past 15 minutes.	none specified
<b>Memory DRAM (MB)</b>	Total DRAM, in megabytes, available to the FPC's processor.	none specified
<b>Heap Utilization (%)</b>	Percentage of heap space (dynamic memory) being used by the FPC's processor. If this number exceeds 80 percent, there may be a software problem (memory leak).  <i>NOTE:</i> On MX Series routers and EX Series switches in a broadband edge environment, heap utilization levels higher than 70 percent can affect unified ISSU, router stability, or scaling capability.	none specified
<b>Buffer Utilization (%)</b>	Percentage of buffer space being used by the FPC's processor for buffering internal messages.	none specified
<b>Total CPU DRAM</b>	Amount of DRAM available to the FPC's CPU.	detail
<b>Total RLDRAM</b>	Amount of reduced latency dynamic random access memory (RLDRAM) available to the FPC CPU.	detail
<b>Total DDR DRAM</b>	Amount of double data rate dynamic random access memory (DDR DRAM) available to the FPC CPU.	detail
<b>Total SRAM</b>	Amount of static RAM (SRAM) used by the FPC's CPU.	detail
<b>Total SDRAM</b>	Total amount of memory used for storing packets and notifications.	detail

Table 139: show chassis fpc Output Fields (continued)

Field Name	Field Description	Level of Output
I/O Manager ASICs information	I/O Manager version number, manufacturer, and part number.	detail
Start time	Time when the Routing Engine detected that the FPC was running.	detail
Uptime	How long the Routing Engine has been connected to the FPC and, therefore, how long the FPC has been up and running.	detail
PIC type	(pic-status output only) Type of PIC.	none specified
GNF (Node slicing)	GNF identifier associated with each line card.  (pic-status output only) GNF identifier associated with each PIC.	all levels

## Sample Output

### show chassis fpc (EX6210 Switch)

```
user@switch> show chassis fpc
```

Slot	State	Temp (C)	CPU Utilization (%) Total	Interrupt	Memory DRAM (MB)	Utilization (%) Heap	Buffer
0	Empty						
1	Online	7	5	0	1024	0	32
2	Empty						
3	Empty						
4	Online	25	17	2	2048	0	30
5	Online	25	3	0	2048	0	24
6	Online	6	5	0	1024	0	32
7	Empty						
8	Empty						
9	Online	8	7	0	1024	0	32

### show chassis fpc (M10 Router)

```
user@host> show chassis fpc
```

```
FPC status:
Slot State Temp (C)
0 Online 27
1 Online 28
```

### show chassis fpc (M20 Router)

```
user@host> show chassis fpc
```

```
FPC status:
Slot State Temp (C) CPU Utilization (%) Memory Utilization (%)
DRAM (MB) Heap Buffer
0 Empty 0 0 0 0 0 0
1 Online 38 0 0 8 0 4
```



2	Online	35	0	0	8	0	3
3	Empty	0	0	0	0	0	0

### show chassis fpc detail (M Series Routers)

```
user@host> show chassis fpc detail 1
```

```
Slot 1 information:
  State                Online
  Temperature          48 degrees C
  Total CPU DRAM       32 MB
  Total SRAM           4 MB
  Total SDRAM          256 MB
  I/O Manager ASICs information Version 2.0, Foundry IBM, Part number 0
  I/O Manager ASICs information Version 2.0, Foundry IBM, Part number 0
  Start time           2000-02-08 02:18:49 UTC
  Uptime               14 hours, 41 minutes, 41 seconds
```

### show chassis fpc detail (MX150)

```
user@host> show chassis fpc detail
```

```
Slot 0 information:
  State                Online
  Temperature          42 degrees C / 107 degrees F
  Total CPU DRAM       2048 MB
  Total RLDRAM         10 MB
  Total DDR DRAM       0 MB
  Start time           2017-04-04 04:44:04 PDT
  Uptime               7 days, 19 hours, 45 minutes, 50 seconds
```

### show chassis fpc detail (MX80 Router)

```
user@host> show chassis fpc detail
```

```
Slot 0 information:
  State                Online
  Temperature          47 degrees C / 116 degrees F
  Total CPU DRAM       1024 MB
  Total SRAM           331 MB
  Total SDRAM          1280 MB
  Start time           2010-02-08 12:25:33 PST
  Uptime               2 hours, 13 minutes, 19 seconds
Slot 1 information:
  State                Online
  Temperature          47 degrees C / 116 degrees F
  Total CPU DRAM       1024 MB
  Total SRAM           331 MB
  Total SDRAM          1280 MB
  Start time           2010-02-08 12:25:33 PST
  Uptime               2 hours, 13 minutes, 19 seconds
```

### show chassis fpc (MX104 Router)

```
user@host> show chassis fpc
```

Temp	CPU	Utilization (%)	Memory	Utilization (%)			
Slot	State	(C)	Total	Interrupt	DRAM (MB)	Heap	Buffer
0	Online	32	15	5	2048	22	13

1	Online	32	15	5	2048	22	13
2	Online	32	15	5	2048	22	13

### show chassis fpc detail (MX104 Router)

```
user@host> show chassis fpc detail
```

Slot 0 information:

```
State Online
Temperature 32 (C)
Total CPU DRAM 2048 MB
Total SRAM 403 MB
Total SDRAM 1316 MB
Start time 2013-05-23 14:39:18 IST
Uptime 1 hour, 20 minutes, 22 seconds
```

Slot 1 information:

```
State Online
Temperature 32 (C)
Total CPU DRAM 2048 MB
Total SRAM 403 MB
Total SDRAM 1316 MB
Start time 2013-05-23 14:39:18 IST
Uptime 1 hour, 20 minutes, 22 seconds
```

Slot 2 information:

```
State Online
Temperature 32 (C)
Total CPU DRAM 2048 MB
Total SRAM 403 MB
Total SDRAM 1316 MB
Start time 2013-05-23 14:39:18 IST
Uptime 1 hour, 20 minutes, 22 seconds
```

### show chassis fpc pic-status (MX104 Router)

```
user@host> show chassis fpc pic-status
```

```
Slot 0 Online
Slot 1 Online
  PIC 0 Online 10x 1GE(LAN) -E SFP
  PIC 1 Online 10x 1GE(LAN) -E SFP
Slot 2 Online
  PIC 0 Online 4x 10GE(LAN) SFP+
```

### show chassis fpc (MX240 Router)

```
user@host> show chassis fpc
```

Slot	State	Temp	CPU Utilization (%)		Memory	Utilization (%)		
			(C)	Total	Interrupt	DRAM (MB)	Heap	Buffer
0	Empty							
1	Online		34	6	0	1024	18	30
2	Online		33	9	0	1024	24	30

### show chassis fpc (MX480 Router)

```
user@host> show chassis fpc
```

Slot	State	Temp	CPU Utilization (%)		Memory	Utilization (%)	
		(C)	Total	Interrupt	DRAM (MB)	Heap	Buffer

```

0 Empty
1 Online          36      9      0      1024      17      57
2 Empty
3 Empty
4 Empty
5 Empty

```

### show chassis fpc detail (EX9200 Switch)

```
user@switch> show chassis fpc detail
```

```

Slot 2 information:
  State                Online
  Temperature           37
  Total CPU DRAM        2048 MB
  Total RLD RAM         331 MB
  Total DDR DRAM        1536 MB
  Start time:           2014-03-12 15:35:28 UTC
  Uptime:               1 hour, 4 minutes, 29 seconds
  Max Power Consumption 239 Watts

Slot 3 information:
  State                Online
  Temperature           39
  Total CPU DRAM        2048 MB
  Total RLD RAM         1036 MB
  Total DDR DRAM        6656 MB
  Start time:           2014-03-12 15:00:18 UTC
  Uptime:               1 hour, 39 minutes, 39 seconds
  Max Power Consumption 520 Watts

```

### show chassis fpc (MX480 Router)

```
user@host> show chassis fpc
```

		Temp	CPU Utilization (%)		CPU Utilization (%)			Memory
Utilization (%)								
Slot	State	(C)	Total	Interrupt	1min	5min	15min	DRAM (MB)
Heap	Buffer							
0	Online		1	0	1	2	3	1024
4		56						
1	Online		1	0	2	2	3	1024
4		56						

### show chassis fpc (MX480 Router with 100-Gigabit Ethernet CFP)

```
user@host> show chassis fpc
```

		Temp	CPU Utilization (%)		Memory	Utilization (%)	
Slot	State	(C)	Total	Interrupt	DRAM (MB)	Heap	Buffer
0	Online	33	4	0	2048	10	13
1	Online	36	7	0	2048	16	13
2	Online	29	6	0	1024	27	29
3	Online	33	0	0	0	0	0
4	Online	36	7	0	2048	19	13
5	Online	34	31	11	2048	14	13

**show chassis fpc pic-status (MX480 Router with 100-Gigabit Ethernet CFP)**

```
user@host> show chassis fpc pic-status
```

```
Slot 1  Online      MPC Type 3
PIC 2   Online      1X100GE CFP
Slot 2  Online      DPCE 40x 1GE R EQ
PIC 0   Online      10x 1GE(LAN) EQ
PIC 1   Online      10x 1GE(LAN) EQ
PIC 2   Online      10x 1GE(LAN) EQ
PIC 3   Online      10x 1GE(LAN) EQ
Slot 3  Online      MPC Type 3
PIC 0   Online      1X100GE CFP
PIC 2   Online      1X100GE CFP
Slot 4  Online      MPC Type 3
PIC 0   Online      1X100GE CFP
PIC 2   Online      1X100GE CFP
Slot 5  Online      MPC Type 2 3D EQ
PIC 0   Online      2x 10GE XFP
PIC 1   Online      2x 10GE XFP
PIC 2   Online      10x 1GE(LAN) SFP
PIC 3   Online      10x 1GE(LAN) SFP
```

**show chassis fpc pic-status (EX Series Switch)**

```
user@host> show chassis fpc pic-status
```

```
Slot 1  Online      EX9200 32x10G SFP
PIC 0   Online      8X10GE SFPP
PIC 1   Online      8X10GE SFPP
PIC 2   Online      8X10GE SFPP
PIC 3   Online      8X10GE SFPP
Slot 2  Online      EX9200 32x10G SFP
PIC 0   Online      8X10GE SFPP
PIC 1   Online      8X10GE SFPP
PIC 2   Online      8X10GE SFPP
PIC 3   Online      8X10GE SFPP
```

**show chassis fpc (MX480 Router with MPC4E)**

```
user@host> show chassis fpc
```

Slot	Temp	CPU Utilization (%)	Memory	Utilization (%)			
State		(C) Total	Interrupt	DRAM (MB)	Heap	Buffer	
0	Empty						
1	Empty						
2	Online	38 7	0	2048	19	14	
3	Online	39 8	0	2048	18	14	
4	Online	39 7	0	2048	17	14	
5	Empty						

**show chassis fpc detail (MX480 Router with MPC4E)**

```
user@host> show chassis fpc detail
```

```
Slot 2 information:
State                      Online
Temperature                38
Total CPU DRAM             2048 MB
Total RLDRAM               1036 MB
```

```

Total DDR DRAM          11264 MB
Start time:             2013-02-18 05:06:57 PST
Uptime:                 17 hours, 41 minutes, 9 seconds
Max Power Consumption    610 Watts
Slot 3 information:
State                   Online
Temperature             38
Total CPU DRAM          2048 MB
Total RLD RAM           1036 MB
Total DDR DRAM          11264 MB
Start time:             2013-02-18 05:07:00 PST
Uptime:                 17 hours, 41 minutes, 6 seconds
Max Power Consumption    610 Watts
Slot 4 information:
State                   Diagnostics
Temperature             37
Total CPU DRAM          0 MB
Total RLD RAM           0 MB
Total DDR DRAM          0 MB
Max Power Consumption    520 Watts

```

#### show chassis fpc (MX480 Router with MPC4E)

```
user@host> show chassis fpc
```

Slot	State	Temp	CPU Utilization (%)	Memory	Utilization (%)	
		(C)	Total	Interrupt	DRAM (MB)	Heap
0	Empty					
1	Empty					
2	Online	38	7	0	2048	19
3	Online	39	8	0	2048	18
4	Online	39	7	0	2048	17
5	Empty					

#### show chassis fpc detail (MX480 Router with MPC4E)

```
user@host> show chassis fpc detail
```

```

Slot 2 information:
State                   Online
Temperature             38
Total CPU DRAM          2048 MB
Total RLD RAM           1036 MB
Total DDR DRAM          11264 MB
Start time:             2013-02-18 05:06:57 PST
Uptime:                 17 hours, 41 minutes, 9 seconds
Max Power Consumption    610 Watts
Slot 3 information:
State                   Online
Temperature             38
Total CPU DRAM          2048 MB
Total RLD RAM           1036 MB
Total DDR DRAM          11264 MB
Start time:             2013-02-18 05:07:00 PST
Uptime:                 17 hours, 41 minutes, 6 seconds
Max Power Consumption    610 Watts
Slot 4 information:
State                   Diagnostics
Temperature             37

```

```

Total CPU DRAM          0 MB
Total RLD RAM           0 MB
Total DDR DRAM          0 MB
Max Power Consumption   520 Watts

```

### show chassis fpc (MX960 Router)

```
user@host> show chassis fpc
```

Slot	State	Temp (C)	Temp Total	CPU Utilization (%) Interrupt	Memory DRAM (MB)	Memory Heap	Utilization (%) Buffer
0	Empty						
1	Empty						
2	Empty						
3	Online	25	19	0	1024	15	57
4	Empty						
5	Online	26	27	0	1024	15	57
6	Empty						
7	Empty						
8	Empty						
9	Empty						
10	Empty						
11	Empty						

### show chassis fpc (MX960 Router with MPC5EQ)

```
user@host> show chassis fpc
```

Slot	State	Temp (C)	Temp Total	CPU Utilization (%) Interrupt	Memory DRAM (MB)	Memory Heap	Utilization (%) Buffer
0	Online	38	16	0	3584	7	13
1	Online	31	15	0	2048	17	13
2	Empty						
3	Online	31	14	0	2048	20	13
4	Online	34	16	0	3584	7	13
5	Online	34	16	0	3584	7	13
6	Empty						
7	Online	32	9	0	2048	18	14
8	Online	36	19	0	3584	7	13
9	Online	31	9	0	2048	13	13
10	Online	35	14	0	3584	7	13
11	Online	33	11	0	2048	18	14

### show chassis fpc detail (MX960 Router with MPC5EQ)

```
user@host> show chassis fpc detail
```

```

Slot 0 information:
  State                Online
  Temperature          38
  Total CPU DRAM       3584 MB
  Total XR2            291 MB
  Total DDR DRAM       24960 MB
  Start time:          2014-04-22 10:01:46 PDT
  Uptime:              1 hour, 23 minutes, 40 seconds
  Max Power Consumption 607 Watts
Slot 1 information:
  State                Online
  Temperature          31

```

```

Total CPU DRAM                2048 MB
Total RLD RAM                 1036 MB
Total DDR DRAM                6656 MB
Start time:                   2014-04-22 10:01:50 PDT
Uptime:                       1 hour, 23 minutes, 36 seconds
Max Power Consumption         520 Watts
Slot 3 information:
State                          Online
Temperature                    31
Total CPU DRAM                2048 MB
Total RLD RAM                 1324 MB
Total DDR DRAM                5120 MB
Start time:                   2014-04-22 10:01:50 PDT
Uptime:                       1 hour, 23 minutes, 36 seconds
Max Power Consumption         440 Watts
Slot 4 information:
State                          Online
Temperature                    34
Total CPU DRAM                3584 MB
Total XR2                     291 MB
Total DDR DRAM                24960 MB
Start time:                   2014-04-22 10:01:54 PDT
Uptime:                       1 hour, 23 minutes, 32 seconds
Max Power Consumption         607 Watts
Slot 5 information:
State                          Online
Temperature                    34
Total CPU DRAM                3584 MB
Total XR2                     291 MB
Total DDR DRAM                24960 MB
Start time:                   2014-04-22 10:01:56 PDT
Uptime:                       1 hour, 23 minutes, 30 seconds
Max Power Consumption         607 Watts
Slot 7 information:
State                          Online
Temperature                    32
Total CPU DRAM                2048 MB
Total RLD RAM                 1036 MB
Total DDR DRAM                11264 MB
Start time:                   2014-04-22 10:02:02 PDT
Uptime:                       1 hour, 23 minutes, 24 seconds
Max Power Consumption         608 Watts
Slot 8 information:
State                          Online
Temperature                    36
Total CPU DRAM                3584 MB
Total XR2                     291 MB
Total DDR DRAM                24960 MB
Start time:                   2014-04-22 10:02:07 PDT
Uptime:                       1 hour, 23 minutes, 19 seconds
Max Power Consumption         607 Watts
Slot 9 information:
State                          Online
Temperature                    31
Total CPU DRAM                2048 MB
Total RLD RAM                 734 MB
Total DDR DRAM                3108 MB
Start time:                   2014-04-22 10:02:05 PDT
Uptime:                       1 hour, 23 minutes, 21 seconds
Max Power Consumption         368 Watts

```

```

Slot 10 information:
  State                Online
  Temperature           35
  Total CPU DRAM        3584 MB
  Total XR2             291 MB
  Total DDR DRAM        24960 MB
  Start time:           2014-04-22 10:02:11 PDT
  Uptime:               1 hour, 23 minutes, 15 seconds
  Max Power Consumption 607 Watts

Slot 11 information:
  State                Online
  Temperature           33
  Total CPU DRAM        2048 MB
  Total RLDRAM          1036 MB
  Total DDR DRAM        11264 MB
  Start time:           2014-04-22 10:02:16 PDT
  Uptime:               1 hour, 23 minutes, 10 seconds
  Max Power Consumption 608 Watts

```

### show chassis fpc pic-status(MX960 Router with MPC5EQ)

```

user@host> show chassis fpc pic-status

Slot 0  Online      MPC5E 3D Q 2CGE+4XGE
  PIC 0  Online      2X10GE SFPP OTN
  PIC 1  Online      1X100GE CFP2 OTN
  PIC 2  Online      2X10GE SFPP OTN
  PIC 3  Online      1X100GE CFP2 OTN
Slot 1  Online      MPCE Type 3 3D
  PIC 0  Online      10X10GE SFPP
  PIC 2  Online      1X100GE CXP
Slot 3  Online      MPC 3D 16x 10GE
  PIC 0  Online      4x 10GE(LAN) SFP+
  PIC 1  Online      4x 10GE(LAN) SFP+
  PIC 2  Online      4x 10GE(LAN) SFP+
  PIC 3  Online      4x 10GE(LAN) SFP+
Slot 4  Online      MPC5E 3D Q 2CGE+4XGE
  PIC 0  Online      2X10GE SFPP OTN
  PIC 1  Online      1X100GE CFP2 OTN
  PIC 2  Online      2X10GE SFPP OTN
  PIC 3  Online      1X100GE CFP2 OTN
Slot 5  Online      MPC5E 3D Q 2CGE+4XGE
  PIC 0  Online      2X10GE SFPP OTN
  PIC 1  Online      1X100GE CFP2 OTN
  PIC 2  Online      2X10GE SFPP OTN
  PIC 3  Online      1X100GE CFP2 OTN
Slot 7  Online      MPC4E 3D 2CGE+8XGE
  PIC 0  Online      4x10GE SFPP
  PIC 1  Online      1X100GE CFP
  PIC 2  Online      4x10GE SFPP
  PIC 3  Online      1X100GE CFP
Slot 8  Online      MPC5E 3D Q 24XGE+6XLGE
  PIC 0  Offline     12X10GE SFPP OTN
  PIC 1  Offline     12X10GE SFPP OTN
  PIC 2  Online      3X40GE QSFPP
  PIC 3  Online      3X40GE QSFPP
Slot 9  Online      MPCE Type 2 3D P
  PIC 0  Online      2x 10GE XFP
  PIC 1  Online      2x 10GE XFP

```



```

Slot 10 Online MPC5E 3D Q 24XGE+6XLGE
PIC 0 Online 12X10GE SFPP
PIC 1 Online 12X10GE SFPP
PIC 2 Offline 3X40GE QSFPP
PIC 3 Offline 3X40GE QSFPP
Slot 11 Online MPC4E 3D 2CGE+8XGE
PIC 0 Online 4x10GE SFPP
PIC 1 Online 1X100GE CFP
PIC 2 Online 4x10GE SFPP
PIC 3 Online 1X100GE CFP

```

### show chassis fpc (MX240, MX480, MX960 Routers with Application Services Modular Line Card)

```
user@host> show chassis fpc 1
```

Temp	CPU Utilization (%)	Memory	Utilization (%)			
Slot State	(C)	Total	Interrupt	DRAM (MB)	Heap	Buffer
1 Online	34	5	0	3072	5	13

### show chassis fpc (MX240, MX480, MX960 with Application Services Modular Line Card)

```
user@host> show chassis fpc 1 detail
```

```

Slot 1 information:
State Online
Temperature 34
Total CPU DRAM 3072 MB
Total RLDRAM 259 MB
Total DDR DRAM 4864 MB
Start time: 2012-06-19 10:51:43 PDT
Uptime: 16 minutes, 48 seconds
Max Power Consumption 550 Watts

```

### show chassis fpc (MX240, MX480, MX960, MX2010, MX2020, and MX2008 Universal Routing Platforms with Dynamic Power Management)

```
user@host> show chassis fpc 2 detail
```

```

Slot 2 information:
State Online
Temperature 37
Total CPU DRAM 3584 MB
Total XR2 275 MB
Total DDR DRAM 20352 MB
Start time: 2014-07-18 02:51:23 PDT
Uptime: 5 minutes, 19 seconds
Max MPC Base Power Consumption 485 Watts
Max MICO Power Consumption 50 Watts
Max MIC1 Power Consumption 50 Watts
Max MPC Total Power Consumption 585 Watts

```

### show chassis fpc (MX2010 Routers)

```
user@host> show chassis fpc
```

Temp	CPU Utilization (%)	Memory	Utilization (%)			
Slot State	(C)	Total	Interrupt	DRAM (MB)	Heap	Buffer

0	Online	34	9	0	2048	18	13
1	Online	32	9	0	2048	15	13
2	Empty						
3	Empty						
4	Empty						
5	Empty						
6	Empty						
7	Empty						
8	Online	31	13	0	2048	11	13
9	Online	33	10	0	2048	18	13

#### show chassis fpc (MX2010 Router with Fabric Grant Bypass Enabled)

Following is the output of the **show chassis fpc** command on an MX2010 router with Switch Fabric Board (SFB), where fabric grant bypass is enabled by default. All MPCs power on.

```
user@host> show chassis fpc
```

Temp	CPU Utilization (%)	Memory	Utilization (%)				
Slot	State	(C)	Total	Interrupt	DRAM (MB)	Heap	Buffer
0	Online	34	20	0	2048	9	14
1	Offline	33	22	0	2048	9	14
2	Online	33	17	0	2048	9	14
3	Offline	34	25	0	2048	9	14
4	Online	32	27	0	2048	9	14
5	Offline	32	26	0	2048	9	14
6	Empty						
7	Empty						
8	Empty						
9	Empty						

#### show chassis fpc (MX2010 Router with Fabric Grant Bypass Disabled)

Following is the output of the **show chassis fpc** command on an MX2010 router with Switch Fabric Board (SFB), where fabric grant bypass has been disabled. MPC1 (MX-MPC1-3D), MPC2 (MX-MPC2-3D), and the 16-port 10-Gigabit Ethernet MPC (MPC-3D-16XGE-SFP) do not power on after you disable fabric grant bypass and reboot the router. Also, FPC misconfiguration alarms are generated.

```
user@host> show chassis fpc
```

Temp	CPU Utilization (%)	Memory	Utilization (%)				
Slot	State	(C)	Total	Interrupt	DRAM (MB)	Heap	Buffer
0	Online	34	20	0	2048	9	14
1	Offline	---FPC misconfiguration---					
2	Online	33	17	0	2048	9	14
3	Offline	---FPC misconfiguration---					
4	Online	32	27	0	2048	9	14
5	Offline	---FPC misconfiguration---					
6	Empty						
7	Empty						
8	Empty						
9	Empty						

**show chassis fpc pic-status (MX2010 Router with Fabric Grant Bypass Enabled)**

Following is the output of the **show chassis fpc pic-status** command on an MX2010 router with Switch Fabric Board (SFB), where fabric grant bypass has been enabled by default. All MPCs power on.

```
user@host> show chassis fpc pic-status
```

Slot 0	Present	MPCE Type 3 3D
Slot 1	Present	MPC Type 2 3D EQ
Slot 2	Present	MPCE Type 3 3D
Slot 3	Present	MPC 3D 16x 10GE
Slot 4	Present	MPCE Type 3 3D
Slot 5	Present	MPCE Type 1 3D Q

**show chassis fpc pic-status (MX2010 Router with Fabric Grant Bypass Disabled)**

Following is the output of the **show chassis fpc pic-status** command on an MX2010 router with Switch Fabric Board (SFB), where fabric grant bypass has been disabled. MPC1 (MX-MPC1-3D), MPC2 (MX-MPC2-3D), and the 16-port 10-Gigabit Ethernet MPC (MPC-3D-16XGE-SFP) do not power on after you disable fabric grant bypass mode and reboot the router.

```
user@host> show chassis fpc pic-status
```

Slot 0	Present	MPCE Type 3 3D
Slot 1	Offline	MPC Type 2 3D EQ
Slot 2	Present	MPCE Type 3 3D
Slot 3	Offline	MPC 3D 16x 10GE
Slot 4	Present	MPCE Type 3 3D
Slot 5	Offline	MPCE Type 1 3D Q

**show chassis fpc (MX2020 Routers)**

```
user@host> show chassis fpc
```

Slot	State	Temp (C)	CPU Utilization (%)		Memory	Utilization (%)	
			Total	Interrupt	DRAM (MB)	Heap	Buffer
0	Online	10	12	0	2048	18	13
1	Online	8	9	0	2048	18	13
2	Online	7	9	0	2048	18	13
3	Online	8	10	0	2048	18	13
4	Online	9	10	0	2048	18	13
5	Online	8	9	0	2048	18	13
6	Online	8	10	0	2048	18	13
7	Online	9	9	0	2048	18	13
8	Online	9	10	0	2048	18	13
9	Online	10	9	0	2048	18	13
10	Online	16	8	0	2048	18	13
11	Online	11	10	0	2048	18	13
12	Online	10	10	0	2048	18	13
13	Online	11	9	0	2048	18	13
14	Online	12	10	0	2048	18	13
15	Online	13	9	0	2048	18	13
16	Online	13	9	0	2048	18	13
17	Online	12	9	0	2048	18	13
18	Online	12	8	0	2048	18	13
19	Online	14	10	0	2048	18	13

## show chassis fpc (MX2020 Router with MPC4E)

user@host&gt; show chassis fpc

Slot	Temp State	CPU Utilization (C)	(%) Total	Memory Interrupt	Utilization (%) DRAM (MB)	Heap	Buffer
0	Online	33	12	2	2048	11	13
1	Empty						
2	Empty						
3	Empty						
4	Empty						
5	Empty						
6	Empty						
7	Empty						
8	Empty						
9	Online	31	10	0	2048	11	13
10	Online	32	7	0	2048	14	13
11	Empty						
12	Empty						
13	Empty						
14	Online	28	12	0	2048	15	14
15	Empty						
16	Empty						
17	Empty						
18	Empty						
19	Online	38	8	0	2048	18	13

## show chassis fpc (MX10003 Router)

user@host&gt; show chassis fpc

Utilization (%)	Temp	CPU Utilization (%)	CPU Utilization (%)	Memory
Slot State	(C)	Total	Interrupt	1min 5min 15min DRAM (MB)
Heap				
0 Online	59	25	0	25 24 23 3136
12 11				
1 Online	62	29	0	26 24 23 3136
12 11				

## show chassis fpc detail (MX10003 Router)

user@host&gt; show chassis fpc detail

## Slot 0 information:

State Online  
 Total CPU DRAM 3136 MB  
 Total RLDRAM 771 MB  
 Total DDR DRAM 18432 MB  
 Temperature 60 degrees C / 140 degrees F  
 Start time 2017-07-19 20:49:58 PDT  
 Uptime 2 hours, 29 minutes, 22 seconds  
 Max MPC base power consumption 910 Watts  
 Max MIC1 power consumption 95 Watts  
 Max MPC total power consumption 1005 Watts

## Slot 1 information:

State Online  
 Total CPU DRAM 3136 MB

```

Total RLD RAM          771 MB
Total DDR DRAM         18432 MB
Temperature             63 degrees C / 145 degrees F
Start time              2017-07-19 20:48:01 PDT
Uptime                  2 hours, 31 minutes, 19 seconds
Max MPC base power consumption 910 Watts
Max MIC1 power consumption 155 Watts
Max MPC total power consumption 1065 Watts

```

### show chassis fpc <fpc-slot> (MX10003 Router)

```
user@host> show chassis fpc 0
```

Utilization (%)	Temp	CPU Utilization (%)		CPU Utilization (%)			Memory
Slot State	(C)	Total	Interrupt	1min	5min	15min	DRAM (MB)
Heap Buffer							
0 Online	49	26	0	22	22	23	3136
12							

### show chassis fpc (MX204 Router)

```
user@host> show chassis fpc
```

Utilization (%)	Temp	CPU Utilization (%)		CPU Utilization (%)			Memory
Slot State	(C)	Total	Interrupt	1min	5min	15min	DRAM (MB)
Heap Buffer							
0 Online	Absent	8	0	8	8	8	3136
8							

### show chassis fpc detail (MX204 Router)

```
user@host> show chassis fpc detail
```

```

Slot 0 information:
State                  Online
Total CPU DRAM         3136 MB
Total RLD RAM          257 MB
Total DDR DRAM         4096 MB
Temperature            Absent
Start time              2017-11-05 22:14:01 PST
Uptime                  2 days, 8 hours, 5 minutes, 55 seconds

```

### show chassis fpc <fpc-slot> (MX204 Router)

```
user@host> show chassis fpc 0
```

Utilization (%)	Temp	CPU Utilization (%)		CPU Utilization (%)			Memory
Slot State	(C)	Total	Interrupt	1min	5min	15min	DRAM (MB)
Heap Buffer							
0 Online	Absent	8	0	8	8	8	3136
8							

**show chassis fpc (MX10008 Router)**

```
user@host> show chassis fpc
```

Utilization (%)		Temp	CPU Utilization (%)		CPU Utilization (%)			Memory
Slot	State	(C)	Total	Interrupt	1min	5min	15min	DRAM (MB)
Heap	Buffer							
0	Online	42	34	0	35	43	39	3136
19								
1	Empty							
2	Online	52	32	0	29	30	30	3136
19								
3	Online	48	20	0	19	18	18	3136
18								
4	Empty							
5	Empty							
6	Empty							
7	Empty							

**show chassis fpc detail (MX10008 Router)**

```
user@host> show chassis fpc detail
```

**Slot 0 information:**

```
State Online
Total CPU DRAM 3136 MB
Total RLDRAM 1542 MB
Total DDR DRAM 36864 MB
Temperature 42 degrees C / 107 degrees F
Start time 2018-07-18 02:12:50 PDT
Uptime 10 minutes, 28 seconds
Max power consumption 1535 Watts
Configured Bandwidth 2400 G
Operating Bandwidth 2400 G
```

**Slot 2 information:**

```
State Online
Total CPU DRAM 3136 MB
Total RLDRAM 1542 MB
Total DDR DRAM 36864 MB
Temperature 52 degrees C / 125 degrees F
Start time 2018-07-17 05:51:15 PDT
Uptime 20 hours, 32 minutes, 3 seconds
Max power consumption 1535 Watts
Configured Bandwidth 2400 G
Operating Bandwidth 2400 G
```

**Slot 3 information:**

```
State Online
Total CPU DRAM 3136 MB
Total RLDRAM 1542 MB
Total DDR DRAM 36864 MB
Temperature 48 degrees C / 118 degrees F
Start time 2018-07-17 05:50:40 PDT
Uptime 20 hours, 32 minutes, 38 seconds
Max power consumption 1475 Watts
Configured Bandwidth 2400 G
Operating Bandwidth 2400 G
```

**show chassis fpc <fpc-slot> (MX10008 Router)**

```
user@host> show chassis fpc 0
```

Utilization (%)		Temp	CPU Utilization (%)		CPU Utilization (%)			Memory
Slot	State	(C)	Total	Interrupt	1min	5min	15min	DRAM (MB)
Heap	Buffer							
0	Online	43	33	0	33	40	38	3136
19	26							

**show chassis fpc detail (MX2020 Router with MPC4E)**

```
user@host> show chassis fpc detail
```

```
Slot 0 information:
  State                Online
  Temperature          34
  Total CPU DRAM       2048 MB
  Total RLD RAM       806 MB
  Total DDR DRAM      2632 MB
  Start time:         2013-02-17 08:17:35 PST
  Uptime:              1 day, 14 hours, 50 minutes, 39 seconds
  Max Power Consumption 368 Watts

Slot 9 information:
  State                Online
  Temperature          32
  Total CPU DRAM       2048 MB
  Total RLD RAM       806 MB
  Total DDR DRAM      2632 MB
  Start time:         2013-02-17 08:17:43 PST
  Uptime:              1 day, 14 hours, 50 minutes, 31 seconds
  Max Power Consumption 368 Watts

Slot 10 information:
  State                Online
  Temperature          37
  Total CPU DRAM       2048 MB
  Total RLD RAM      1036 MB
  Total DDR DRAM      6656 MB
  Start time:         2013-02-17 08:17:54 PST
  Uptime:              1 day, 14 hours, 50 minutes, 20 seconds
  Max Power Consumption 520 Watts

Slot 14 information:
  State                Online
  Temperature          32
  Total CPU DRAM       2048 MB
  Total RLD RAM      1036 MB
  Total DDR DRAM     11264 MB
  Start time:         2013-02-17 08:18:01 PST
  Uptime:              1 day, 14 hours, 50 minutes, 13 seconds
  Max Power Consumption 610 Watts

Slot 19 information:
  State                Online
  Temperature          38
  Total CPU DRAM       2048 MB
  Total RLD RAM       1324 MB
  Total DDR DRAM      5120 MB
  Start time:         2013-02-17 08:18:08 PST
  Uptime:              1 day, 14 hours, 50 minutes, 6 seconds
  Max Power Consumption 440 Watts
```

## show chassis fpc (MX2020 Router with MPC5EQ and MPC6E)

user@host&gt; show chassis fpc

Slot	State	Temp (C)	CPU Utilization (%)		Memory DRAM (MB)	Utilization (%)	
			Total	Interrupt		Heap	Buffer
0	Online	31	20	0	3584	7	13
1	Online	28	19	0	2048	17	13
2	Online	27	10	0	2048	18	14
3	Online	26	10	0	2048	13	13
4	Online	29	19	0	3584	7	13
5	Online	28	68	0	2048	20	13
6	Empty						
7	Empty						
8	Empty						
9	Online	36	19	0	3584	10	13
10	Online	37	26	0	3584	10	13
11	Empty						
12	Empty						
13	Empty						
14	Empty						
15	Empty						
16	Empty						
17	Online	28	43	0	3584	10	13
18	Online	29	19	0	3584	7	13
19	Online	31	19	0	3584	7	13

## show chassis fpc detail (MX2020 Router with MPC5EQ and MPC6E)

user@host&gt; show chassis fpc detail

```

Slot 0 information:
  State                Online
  Temperature          31
  Total CPU DRAM       3584 MB
  Total XR2            291 MB
  Total DDR DRAM       24960 MB
  Start time:          2014-04-22 23:33:19 PDT
  Uptime:              6 minutes, 24 seconds
  Max Power Consumption 607 Watts

Slot 1 information:
  State                Online
  Temperature          28
  Total CPU DRAM       2048 MB
  Total RLD RAM        1036 MB
  Total DDR DRAM       6656 MB
  Start time:          2014-04-22 23:33:24 PDT
  Uptime:              6 minutes, 19 seconds
  Max Power Consumption 520 Watts

Slot 2 information:
  State                Online
  Temperature          27
  Total CPU DRAM       2048 MB
  Total RLD RAM        1036 MB
  Total DDR DRAM       11264 MB
  Start time:          2014-04-22 23:33:34 PDT
  Uptime:              6 minutes, 9 seconds
  Max Power Consumption 608 Watts

Slot 3 information:

```



```

State                               Online
Temperature                         26
Total CPU DRAM                      2048 MB
Total RLDRAM                        734 MB
Total DDR DRAM                      3108 MB
Start time:                        2014-04-22 23:33:39 PDT
Uptime:                             6 minutes, 4 seconds
Max Power Consumption               368 Watts
Slot 4 information:
State                               Online
Temperature                         29
Total CPU DRAM                      3584 MB
Total XR2                           291 MB
Total DDR DRAM                      24960 MB
Start time:                        2014-04-22 23:33:51 PDT
Uptime:                             5 minutes, 52 seconds
Max Power Consumption               607 Watts
Slot 5 information:
State                               Online
Temperature                         28
Total CPU DRAM                      2048 MB
Total RLDRAM                        1324 MB
Total DDR DRAM                      5120 MB
Start time:                        2014-04-22 23:33:57 PDT
Uptime:                             5 minutes, 46 seconds
Max Power Consumption               440 Watts
Slot 9 information:
State                               Online
Temperature                         25
Total CPU DRAM                      3584 MB
Total XR2                           518 MB
Total DDR DRAM                      49920 MB
Start time:                        2014-04-22 23:31:20 PDT
Uptime:                             8 minutes, 23 seconds
Max Power Consumption               1130 Watts
Slot 10 information:
State                               Online
Temperature                         32
Total CPU DRAM                      3584 MB
Total XR2                           518 MB
Total DDR DRAM                      49920 MB
Start time:                        2014-04-22 23:31:25 PDT
Uptime:                             8 minutes, 18 seconds
Max Power Consumption               1130 Watts
Slot 17 information:
State                               Online
Temperature                         25
Total CPU DRAM                      3584 MB
Total XR2                           518 MB
Total DDR DRAM                      49920 MB
Start time:                        2014-04-22 23:31:29 PDT
Uptime:                             8 minutes, 14 seconds
Max Power Consumption               1130 Watts
Slot 18 information:
State                               Online
Temperature                         29
Total CPU DRAM                      3584 MB
Total XR2                           291 MB
Total DDR DRAM                      24960 MB
Start time:                        2014-04-22 23:34:11 PDT

```

```

Uptime:                    5 minutes, 32 seconds
Max Power Consumption      607 Watts
Slot 19 information:
State                      Online
Temperature                32
Total CPU DRAM             3584 MB
Total XR2                  291 MB
Total DDR DRAM             24960 MB
Start time:                2014-04-22 23:34:20 PDT
Uptime:                    5 minutes, 23 seconds
Max Power Consumption      607 Watts

```

### show chassis fpc detail (MX2008 Router)

```
user@host>show chassis fpc detail
```

```

Slot 0 information:
State                      Online
Temperature                33 degrees C / 91 degrees F
Total CPU DRAM             2048 MB
Total RLDRAM               734 MB
Total DDR DRAM             2596 MB
Start time                 2017-04-14 07:14:26 PDT
Uptime                     15 hours, 29 minutes, 20 seconds
Max power consumption      347 Watts
Slot 3 information:
State                      Online
Temperature                31 degrees C / 87 degrees F
Total CPU DRAM             3584 MB
Total RLDRAM               259 MB
Total DDR DRAM             20352 MB
Start time                 2017-04-14 07:14:38 PDT
Uptime                     15 hours, 29 minutes, 8 seconds
Max MPC base power consumption 376 Watts
Max MICO power consumption  0 Watts
Max MIC1 power consumption  0 Watts
Max MPC total power consumption 376 Watts
Slot 5 information:
State                      Online
Temperature                32 degrees C / 89 degrees F
Total CPU DRAM             3584 MB
Total RLDRAM               275 MB
Total DDR DRAM             20352 MB
Start time                 2017-04-14 07:14:46 PDT
Uptime                     15 hours, 29 minutes
Max MPC base power consumption 422 Watts
Max MICO power consumption  18 Watts
Max MIC1 power consumption  0 Watts
Max MPC total power consumption 440 Watts
Slot 7 information:
State                      Online
Temperature                28 degrees C / 82 degrees F
Total CPU DRAM             2048 MB
Total RLDRAM               403 MB
Total DDR DRAM             1572 MB
Start time                 2017-04-14 07:14:50 PDT
Uptime                     15 hours, 28 minutes, 56 seconds
Max power consumption      347 Watts
Slot 9 information:
State                      Online

```

```

Temperature                29
Total CPU DRAM              3584 MB
Total XR2                   518 MB
Total DDR DRAM              49920 MB
Start time                  2017-04-14 07:13:16 PDT
Uptime                      15 hours, 30 minutes, 30 seconds
Max MPC base power consumption 834 Watts
Max MICO power consumption   56 Watts
Max MIC1 power consumption   0 Watts
Max MPC total power consumption 890 Watts

```

### show chassis fpc pic-status (MX2020 Router with MPC5EQ and MPC6E)

```
user@host> show chassis fpc pic-status
```

```

Slot 0  Online      MPC5E 3D Q 24XGE+6XLGE
PIC 0   Online      12X10GE SFPP OTN
PIC 1   Online      12X10GE SFPP OTN
PIC 2   Offline     3X40GE QSFPP
PIC 3   Offline     3X40GE QSFPP
Slot 1  Online      MPCE Type 3 3D
PIC 0   Online      10X10GE SFPP
PIC 2   Online      1X100GE CXP
Slot 2  Online      MPC4E 3D 2CGE+8XGE
PIC 0   Online      4x10GE SFPP
PIC 1   Online      1X100GE CFP
PIC 2   Online      4x10GE SFPP
PIC 3   Online      1X100GE CFP
Slot 3  Online      MPCE Type 2 3D P
PIC 0   Online      2x 10GE XFP
PIC 1   Online      2x 10GE XFP
Slot 4  Online      MPC5E 3D Q 2CGE+4XGE
PIC 0   Online      2X10GE SFPP OTN
PIC 1   Online      1X100GE CFP2 OTN
PIC 2   Online      2X10GE SFPP OTN
PIC 3   Online      1X100GE CFP2 OTN
Slot 5  Online      MPC 3D 16x 10GE
PIC 0   Online      4x 10GE(LAN) SFP+
PIC 1   Online      4x 10GE(LAN) SFP+
PIC 2   Online      4x 10GE(LAN) SFP+
PIC 3   Online      4x 10GE(LAN) SFP+
Slot 9  Online      MPC6E 3D
PIC 0   Online      2X100GE CFP2 OTN
PIC 1   Online      2X100GE CFP2 OTN
Slot 10 Online      MPC6E 3D
PIC 0   Online      24X10GE SFPP OTN
PIC 1   Online      4X100GE CXP
Slot 17 Online      MPC6E 3D
PIC 0   Online      24X10GE SFPP
PIC 1   Online      4X100GE CXP
Slot 18 Online      MPC5E 3D Q 24XGE+6XLGE
PIC 0   Offline     12X10GE SFPP OTN
PIC 1   Offline     12X10GE SFPP OTN
PIC 2   Online      3X40GE QSFPP
PIC 3   Online      3X40GE QSFPP
Slot 19 Online      MPC5E 3D Q 24XGE+6XLGE
PIC 0   Online      12X10GE SFPP OTN
PIC 1   Offline     12X10GE SFPP OTN
PIC 2   Offline     3X40GE QSFPP
PIC 3   Online      3X40GE QSFPP

```

### show chassis fpc detail (MX Series Routers)

```
user@host> show chassis fpc detail 2

Slot 0 information:
  State                Online
  Temperature           36 degrees C / 96 degrees F
  Total CPU DRAM        1024 MB
  Total RLD RAM         256 MB
  Total DDR DRAM        4096 MB
  Start time:           2009-08-11 21:20:30 PDT
  Uptime:               2 hours, 8 minutes, 50 seconds
  Max Power Consumption 335 Watts
```

### show chassis fpc detail (EX Series Switches)

```
user@host> show chassis fpc detail 2

Slot 1 information:
  State                Online
  Temperature           41
  Total CPU DRAM        2048 MB
  Total RLD RAM         1036 MB
  Total DDR DRAM        11264 MB
  Start time:           2013-04-02 00:04:52 PDT
  Uptime:               7 days, 9 hours, 47 minutes, 46 seconds
  Max Power Consumption 610 Watts

Slot 2 information:
  State                Online
  Temperature           41
  Total CPU DRAM        2048 MB
  Total RLD RAM         1036 MB
  Total DDR DRAM        11264 MB
  Start time:           2013-04-02 00:04:56 PDT
  Uptime:               7 days, 9 hours, 47 minutes, 42 seconds
  Max Power Consumption 610 Watts
```

### show chassis fpc detail (EX9251 Switches)

```
user@switch> show chassis fpc detail 2

Slot 0 information:
  State                Online
  Total CPU DRAM        3136 MB
  Total RLD RAM         257 MB
  Total DDR DRAM        4096 MB
  Temperature           Absent
  Start time:           2018-03-12 14:59:49 PDT
  Uptime                1 day, 1 hour, 10 minutes, 48 seconds
```

### show chassis fpc detail (EX9253 Switches)

```
user@switch> show chassis fpc detail 1

Slot 1 information:
  State                Online
  Total CPU DRAM        3136 MB
  Total RLD RAM         771 MB
  Total DDR DRAM        18432 MB
```

```

Temperature                59 degrees C / 138 degrees F
Start time                 2018-03-04 14:20:42 PST
Uptime                    3 days, 10 hours, 40 minutes, 57 seconds
Max MPC base power consumption 910 Watts
Max MIC1 power consumption 95 Watts
Max MPC total power consumption 1005 Watts

```

### show chassis fpc (Hardware Not Supported)

```
user@host> show chassis fpc
```

```

show chassis fpc

```

Slot	State	Temp (C)	CPU Utilization (%)	Memory Utilization (%)
			Total Interrupt	DRAM (MB) Heap Buffer
0	Online			
1	Present			
2	Online	0	0	0
3	Present			
4	Empty			
5	Empty			
6	Online	0	0	0

### show chassis fpc detail (Hardware Not Supported)

```
user@host> show chassis fpc detail
```

```

Slot 0 information:
  State                Online
  Total CPU DRAM       ---- CPU less FPC ----
  Start time          2006-07-07 03:21:00 UTC
  Uptime              27 minutes, 51 seconds
Slot 1 information:
  State                Present
  Reason              --- Hardware Not In Right Slot ---
Slot 2 information:
  State                Online
  Total CPU DRAM       32 MB
  Start time          2006-07-07 03:20:59 UTC
  Uptime              27 minutes, 52 seconds
Slot 3 information:
  State                Present
  Reason              --- Hardware Not Supported ---
  Total CPU DRAM       0 MB
Slot 6 information:
  State                Online
  Total CPU DRAM       32 MB
  Start time          2006-07-07 03:21:01 UTC
  Uptime              27 minutes, 50 seconds

```

### show chassis fpc pic-status

```
user@host> show chassis fpc pic-status
```

```

Slot 0 Online
  PIC 1    1x OC-12 ATM, MM
  PIC 2    1x OC-12 ATM, MM
  PIC 3    1x OC-12 ATM, MM
Slot 1 Online

```

```

PIC 0    1x OC-48 SONET, SMIR
Slot 2 Online
PIC 0    1x OC-192 SONET, SMSR

```

### show chassis fpc pic-status (M Series Routers)

```

user@host> show chassis fpc pic-status

Slot 1  Online      FPC Type 1
PIC 0   Present    2x OC-3 ATM, MM- Hardware Error
PIC 1   Online     4x OC-3 SONET, SMIR
Slot 2  Online      E-FPC Type 2
PIC 0   Online     4x G/E, 1000 BASE-SX
PIC 1   Online     2x G/E SFP, 1000 BASE
PIC 3   Online     1x Tunnel
Slot 3  Online      E-FPC Type 1
PIC 0   Online     1x G/E IQ, 1000 BASE
PIC 2   Online     1x G/E SFP, 1000 BASE
Slot 4  Online      E-FPC Type 2
PIC 0   Online     4x G/E SFP, 1000 BASE
PIC 1   Online     4x G/E SFP, 1000 BASE
PIC 2   Online     4x G/E SFP, 1000 BASE
PIC 3   Online     4x G/E SFP, 1000 BASE
Slot 5  Online      FPC Type 2
...

```

### show chassis fpc pic-status (M120 Router)

```

user@host> show chassis fpc pic-status

Slot 1  Online      M120 CFPC 10GE
PIC 0   Online     1x 10GE(LAN/WAN) XFP
Slot 3  Online      M120 FPC Type 2 (proto)
PIC 0   Online     2x G/E IQ, 1000 BASE
PIC 1   Online     4x OC-3 SONET, SMIR
PIC 2   Online     2x G/E IQ, 1000 BASE
PIC 3   Online     8x 1GE(LAN), IQ2
Slot 4  Online      M120 FPC Type 3 (proto)
PIC 0   Online     10x 1GE(LAN), 1000 BASE
Slot 5  Online      M120 FPC Type 1 (proto)
PIC 0   Present    1x G/E, 1000 BASE-LX- Not Supported
PIC 1   Online     1x CHOC3 IQ SONET, SMLR
PIC 2   Online     4x CHDS3 IQ
PIC 3   Online     1x G/E SFP, 1000 BASE

```

### show chassis fpc pic-status (MX240, MX480, and MX960 Routers with Application Services Modular Line Card)

In the following output **Slot 1** and **Slot 5** are the Application Services Modular Carrier Cards (AS MCC), **PIC 0** is the Application Services Modular Storage Card (AS MSC), and **PIC 2** is the Application Services Modular Processing Card (AS MXC).

```

user@host>show chassis fpc pic-status

Slot 2  Online      MPC Type 1 3D Q
Slot 1  Online      AS-MCC
PIC 0   Online      AS-MSC
PIC 2   Online      AS-MXC

```

```
Slot 4  Offline      MPC 3D 16x 10GE
Slot 5  Offline      AS-MCC
```

### show chassis fpc lcc (TX Matrix Router)

```
user@host> show chassis fpc lcc 0
```

```
lcc0-re0:
```

Slot	State	Temp (C)	CPU Total	Interrupt	Utilization (%) DRAM (MB)	Memory Heap	Utilization (%) Buffer
0	Empty						
1	Online	27	2	0	256	8	44
2	Online	27	3	0	256	15	44
3	Empty						
4	Empty						
5	Empty						
6	Empty						
7	Empty						

### show chassis fpc pic-status (TX Matrix Router)

```
user@host> show chassis fpc pic-status
```

```
lcc0-re0:
```

Slot 0	Online	FPC Type 3
PIC 0	Online	1x OC-192 SM SR1
PIC 1	Online	1x OC-192 SM SR2
PIC 2	Online	1x OC-192 SM SR1
PIC 3	Online	1x Tunnel
Slot 1	Online	FPC Type 2
PIC 0	Online	1x OC-48 SONET, SMSR
PIC 1	Online	1x OC-48 SONET, SMSR

```
lcc1-re0:
```

```
lcc2-re0:
```

Slot 1	Online	FPC Type 3
PIC 0	Online	1x OC-192 SM SR1
Slot 5	Online	FPC Type 2
PIC 0	Online	1x OC-48 SONET, SMSR
PIC 1	Online	2x G/E, 1000 BASE-LX
PIC 2	Online	2x G/E, 1000 BASE-LX
PIC 3	Online	1x OC-48 SONET, SMSR

```
lcc3-re0:
```

### show chassis fpc pic-status lcc (TX Matrix Router)

```
user@host> show chassis fpc pic-status lcc 0
```

```
lcc0-re0:
```

Slot 0	Online	FPC Type 3
PIC 0	Online	1x OC-192 SM SR2

```

Slot 1  Online      FPC Type 2
PIC 0  Online      2x OC-12 ATM2 IQ, MM
PIC 1  Online      1x OC-48 SONET, SMSR
PIC 2  Online      1x OC-48 SONET, SMSR
PIC 3  Online      4x G/E, 1000 BASE-SX

```

### show chassis fpc (TX Matrix Plus Router)

```
user@host> show chassis fpc
```

```
lcc0-re0:
```

Slot	State	Temp (C)	CPU Utilization (%)	Memory DRAM (MB)	Utilization (%)
			Total Interrupt	Heap	Buffer
0	Empty				
1	Online	38	4 0	2048	3 24
2	Online	43	8 0	2048	6 24
3	Empty				
4	Online	43	6 0	2048	6 24
5	Empty				
6	Online	42	13 0	2048	6 24
7	Online	45	7 0	2048	3 24

```
lcc2-re0:
```

Slot	State	Temp (C)	CPU Utilization (%)	Memory DRAM (MB)	Utilization (%)
			Total Interrupt	Heap	Buffer
0	Online	42	10 0	2048	6 24
1	Empty				
2	Online	42	11 0	2048	6 24
3	Online	40	5 0	2048	3 24
4	Online	33	26 0	1024	8 49
5	Empty				
6	Online	43	8 0	2048	6 24
7	Online	46	6 0	2048	3 24

```
lcc3-re0:
```

Slot	State	Temp (C)	CPU Utilization (%)	Memory DRAM (MB)	Utilization (%)
			Total Interrupt	Heap	Buffer
0	Empty				
1	Empty				
2	Online	39	30 0	2048	7 24
3	Empty				
4	Online	41	8 0	2048	6 24
5	Online	41	12 0	2048	6 24
6	Online	40	8 0	2048	6 24
7	Online	42	4 0	2048	3 24

### show chassis fpc lcc (TX Matrix Plus Router)

```
user@host> show chassis fpc lcc 0
```

```
lcc0-re0:
```

Slot	State	Temp (C)	CPU Utilization (%)	Memory DRAM (MB)	Utilization (%)
			Total Interrupt	Heap	Buffer
0	Empty				
1	Online	38	4 0	2048	3 24



2	Online	43	8	0	2048	6	24
3	Empty						
4	Online	43	6	0	2048	6	24
5	Empty						
6	Online	42	14	0	2048	6	24
7	Online	45	6	0	2048	3	24

### show chassis fpc detail (TX Matrix Plus Router)

```
user@host> show chassis fpc details
```

```
lcc0-re0:
```

#### Slot 1 information:

```
State                Online
Temperature           38 degrees C / 100 degrees F
Total CPU DRAM        2048 MB
Total SRAM            64 MB
Total SDRAM           1280 MB
Start time            2010-10-04 20:06:22 PDT
Uptime                1 hour, 32 minutes, 51 seconds
```

#### Slot 2 information:

```
State                Online
Temperature           43 degrees C / 109 degrees F
Total CPU DRAM        2048 MB
Total SRAM            128 MB
Total SDRAM           2560 MB
Start time            2010-10-04 20:06:37 PDT
Uptime                1 hour, 32 minutes, 36 seconds
```

#### Slot 4 information:

```
State                Online
Temperature           43 degrees C / 109 degrees F
Total CPU DRAM        2048 MB
Total SRAM            128 MB
Total SDRAM           2560 MB
Start time            2010-10-04 20:06:40 PDT
Uptime                1 hour, 32 minutes, 33 seconds
```

#### Slot 6 information:

```
State                Online
Temperature           42 degrees C / 107 degrees F
Total CPU DRAM        2048 MB
Total SRAM            128 MB
Total SDRAM           2560 MB
Start time            2010-10-04 20:06:42 PDT
Uptime                1 hour, 32 minutes, 31 seconds
```

#### Slot 7 information:

```
State                Online
Temperature           45 degrees C / 113 degrees F
Total CPU DRAM        2048 MB
Total SRAM            64 MB
Total SDRAM           1280 MB
Start time            2010-10-04 20:06:43 PDT
Uptime                1 hour, 32 minutes, 30 seconds
```

```
lcc2-re0:
```

#### Slot 0 information:

```
State                Online
Temperature           42 degrees C / 107 degrees F
```

```

Total CPU DRAM          2048 MB
Total SRAM              128 MB
Total SDRAM            2560 MB
Start time              2010-10-04 20:06:35 PDT
Uptime                  1 hour, 32 minutes, 38 seconds
Slot 2 information:
State                   Online
Temperature             42 degrees C / 107 degrees F
Total CPU DRAM          2048 MB
Total SRAM              128 MB
Total SDRAM            2560 MB
Start time              2010-10-04 20:06:37 PDT
Uptime                  1 hour, 32 minutes, 36 seconds
Slot 3 information:
State                   Online
Temperature             40 degrees C / 104 degrees F
Total CPU DRAM          2048 MB
Total SRAM              64 MB
Total SDRAM            1280 MB
Start time              2010-10-04 20:06:28 PDT
Uptime                  1 hour, 32 minutes, 45 seconds
Slot 4 information:
State                   Online
Temperature             33 degrees C / 91 degrees F
Total CPU DRAM          1024 MB
Total SRAM              64 MB
Total SDRAM            1280 MB
Start time              2010-10-04 20:08:03 PDT
Uptime                  1 hour, 31 minutes, 10 seconds
Slot 6 information:
State                   Online
Temperature             43 degrees C / 109 degrees F
Total CPU DRAM          2048 MB
Total SRAM              128 MB
Total SDRAM            2560 MB
Start time              2010-10-04 20:06:44 PDT
Uptime                  1 hour, 32 minutes, 29 seconds
Slot 7 information:
State                   Online
Temperature             46 degrees C / 114 degrees F
Total CPU DRAM          2048 MB
Total SRAM              64 MB
Total SDRAM            1280 MB
Start time              2010-10-04 20:06:46 PDT
Uptime                  1 hour, 32 minutes, 27 seconds

```

lcc3-re0:

```

-----
Slot 2 information:
State                   Online
Temperature             38 degrees C / 100 degrees F
Total CPU DRAM          2048 MB
Total SRAM              128 MB
Total SDRAM            2560 MB
Start time              2010-10-04 20:17:31 PDT
Uptime                  1 hour, 21 minutes, 42 seconds
Slot 4 information:
State                   Online
Temperature             41 degrees C / 105 degrees F
Total CPU DRAM          2048 MB

```

```

Total SRAM                128 MB
Total SDRAM                2560 MB
Start time                2010-10-04 20:17:34 PDT
Uptime                    1 hour, 21 minutes, 39 seconds
Slot 5 information:
State                      Online
Temperature                41 degrees C / 105 degrees F
Total CPU DRAM            2048 MB
Total SRAM                128 MB
Total SDRAM                2560 MB
Start time                2010-10-04 20:17:36 PDT
Uptime                    1 hour, 21 minutes, 37 seconds
Slot 6 information:
State                      Online
Temperature                40 degrees C / 104 degrees F
Total CPU DRAM            2048 MB
Total SRAM                128 MB
Total SDRAM                2560 MB
Start time                2010-10-04 20:17:39 PDT
Uptime                    1 hour, 21 minutes, 34 seconds
Slot 7 information:
State                      Online
Temperature                42 degrees C / 107 degrees F
Total CPU DRAM            2048 MB
Total SRAM                64 MB
Total SDRAM                1280 MB
Start time                2010-10-04 20:17:41 PDT
Uptime                    1 hour, 21 minutes, 32 seconds

```

### show chassis fpc pic-status (TX Matrix Plus Router)

```
user@host> show chassis fpc pic-status
```

```
1cc0-re0:
```

```

-----
Slot 1  Online      FPC Type 2-ES
PIC 0   Online      8x 1GE(LAN), IQ2
Slot 2  Online      FPC Type 4-ES
PIC 0   Online      4x 10GE (LAN/WAN) XFP
Slot 4  Online      FPC Type 4-ES
PIC 0   Online      4x 10GE (LAN/WAN) XFP
Slot 6  Online      FPC Type 4-ES
PIC 0   Online      4x 10GE (LAN/WAN) XFP
PIC 1   Online      4x 10GE (LAN/WAN) XFP
Slot 7  Online      FPC Type 3-ES
PIC 0   Online      10x 1GE(LAN), 1000 BASE
PIC 2   Online      1x OC-192 SM SR2
PIC 3   Online      10x 1GE(LAN), 1000 BASE

```

```
1cc2-re0:
```

```

-----
Slot 0  Online      FPC Type 4-ES
PIC 0   Online      4x 10GE (LAN/WAN) XFP
Slot 2  Online      FPC Type 4-ES
PIC 0   Online      4x 10GE (LAN/WAN) XFP
PIC 1   Online      4x 10GE (LAN/WAN) XFP
Slot 3  Online      FPC Type 2-ES
PIC 0   Online      8x 1GE(LAN), IQ2
Slot 4  Online      FPC Type 4

```

```

PIC 0 Online      10x10GE(LAN/WAN) SFPP
Slot 6 Online      FPC Type 4-ES
PIC 0 Online      4x OC-192 SONET XFP
Slot 7 Online      FPC Type 3-ES
PIC 0 Online      10x 1GE(LAN), 1000 BASE
PIC 1 Offline     1x 10GE(LAN/WAN) IQ2E
PIC 2 Online      1x OC-192 SM SR2
PIC 3 Online      1x Tunnel

```

1cc3-re0:

```

Slot 2 Online      FPC Type 4-ES
PIC 0 Online      10x10GE(LAN/WAN) SFPP
Slot 4 Online      FPC Type 4-ES
PIC 0 Online      4x OC-192 SONET XFP
Slot 5 Online      FPC Type 4-ES
PIC 0 Online      4x OC-192 SONET XFP
PIC 1 Online      4x 10GE (LAN/WAN) XFP
Slot 6 Online      FPC Type 4-ES
PIC 1 Online      4x 10GE (LAN/WAN) XFP
Slot 7 Online      FPC Type 3-ES
PIC 0 Online      10x 1GE(LAN), 1000 BASE
PIC 1 Online      8x 1GE(TYPE3), IQ2E
PIC 2 Online      4x OC-48 SONET

```

### show chassis fpc (T1600 Router)

user@host> show chassis fpc

Slot	State	Temp (C)	CPU Utilization (%) Total Interrupt	Memory DRAM (MB)	Utilization (%) Heap Buffer
0	Empty				
1	Empty				
2	Online	49	3 0	2048	3 24
3	Online	46	6 0	2048	6 24
4	Empty				
5	Online	46	5 0	2048	3 24
6	Empty				
7	Online	44	8 0	1024	7 49

### show chassis fpc detail (T1600 Router)

user@host> show chassis fpc detail

show chassis fpc detail

Slot 2 information:

```

State Online
Temperature 49 degrees C / 120 degrees F
Total CPU DRAM 2048 MB
Total SRAM 64 MB
Total SDRAM 1280 MB
Start time 2010-10-04 21:12:52 PDT
Uptime 32 minutes, 9 seconds

```

Slot 3 information:

```

State Online
Temperature 47 degrees C / 116 degrees F
Total CPU DRAM 2048 MB
Total SRAM 128 MB

```

```

Total SDRAM                2560 MB
Start time                 2010-10-04 21:13:06 PDT
Uptime                    31 minutes, 55 seconds
Slot 5 information:
State                      Online
Temperature                46 degrees C / 114 degrees F
Total CPU DRAM             2048 MB
Total SRAM                 64 MB
Total SDRAM                1280 MB
Start time                 2010-10-04 21:12:56 PDT
Uptime                    32 minutes, 5 seconds
Slot 7 information:
State                      Online
Temperature                44 degrees C / 111 degrees F
Total CPU DRAM             1024 MB
Total SRAM                 64 MB
Total SDRAM                1280 MB
Start time                 2010-10-04 21:14:34 PDT
Uptime                    30 minutes, 27 seconds

```

### show chassis fpc <fpc-slot> (EX Series Switch)

```
user@host> show chassis fpc 2
```

Slot	State	Temp (C)	CPU Utilization (%)	Memory DRAM (MB)	Utilization (%)
			Total Interrupt	Heap	Buffer
2	Online	40	12 0	2048 19	14

### show chassis fpc slot (T1600 Router)

```
user@host> show chassis fpc slot 2
```

Slot	State	Temp (C)	CPU Utilization (%)	Memory DRAM (MB)	Utilization (%)
			Total Interrupt	Heap	Buffer
2	Online	49	3 0	2048 3	24

### show chassis fpc pic-status (T1600 Router)

```
user@host> show chassis fpc pic-status
```

```

Slot 2  Online      FPC Type 1-ES
PIC 0   Online      Load Type 1
PIC 1   Online      4x 1GE(LAN), IQ2E
PIC 3   Online      1x OC-12-3 SFP
Slot 3  Online      FPC Type 4-ES
PIC 0   Online      4x 10GE (LAN/WAN) XFP
PIC 1   Online      4x OC-192 SONET XFP
Slot 5  Online      FPC Type 2-ES
PIC 0   Online      Load Type 2
PIC 1   Online      8x 1GE(LAN), IQ2E
PIC 2   Online      8x 1GE(LAN), IQ2E
PIC 3   Online      1x OC-48-12-3 SFP
Slot 7  Online      FPC Type 4
PIC 0   Online      4x 10GE (LAN/WAN) XFP

```

**show chassis fpc (T4000 Router)**

```
user@host> show chassis fpc
```

Slot	State	Temp (C)	CPU Utilization (%) Total Interrupt	Memory DRAM (MB)	Utilization (%) Heap Buffer
0	Online	48	15 0	2816	21 27
1	Empty				
2	Empty				
3	Online	51	15 0	2816	21 27
4	Empty				
5	Online	39	8 0	2048	6 23
6	Online	49	15 0	2816	21 27
7	Empty				

**show chassis fpc detail (T4000 Router)**

```
user@host> show chassis fpc detail
```

```
Slot 0 information:
  State                Online
  Temperature          48 degrees C / 118 degrees F
  Total CPU DRAM       2816 MB
  Total SRAM           1554 MB
  Total SDRAM          10752 MB
  Start time           2012-02-09 22:56:25 PST
  Uptime               2 hours, 40 minutes, 52 seconds

Slot 3 information:
  State                Online
  Temperature          51 degrees C / 123 degrees F
  Total CPU DRAM       2816 MB
  Total SRAM           1554 MB
  Total SDRAM          10752 MB
  Start time           2012-02-09 22:56:22 PST
  Uptime               2 hours, 40 minutes, 55 seconds

Slot 5 information:
  State                Online
  Temperature          39 degrees C / 102 degrees F
  Total CPU DRAM       2048 MB
  Total SRAM           128 MB
  Total SDRAM          2560 MB
  Start time           2012-02-09 22:51:27 PST
  Uptime               2 hours, 45 minutes, 50 seconds

Slot 6 information:
  State                Online
  Temperature          49 degrees C / 120 degrees F
  Total CPU DRAM       2816 MB
  Total SRAM           1554 MB
  Total SDRAM          10752 MB
  Start time           2012-02-09 22:56:29 PST
  Uptime               2 hours, 40 minutes, 48 seconds
```

**show chassis fpc pic-status (T4000 Router)**

```
user@host> show chassis fpc pic-status
```

Slot 0	Online	FPC Type 5-3D
PIC 0	Online	12x10GE (LAN/WAN) SFPP
PIC 1	Online	12x10GE (LAN/WAN) SFPP

```

Slot 3  Online      FPC Type 5-3D
PIC 0   Online      1x100GE
PIC 1   Online      12x10GE (LAN/WAN) SFPP
Slot 5  Online      FPC Type 4-ES
PIC 0   Online      100GE
PIC 1   Online      100GE CFP
Slot 6  Online      FPC Type 5-3D
PIC 0   Online      12x10GE (LAN/WAN) SFPP
PIC 1   Online      12x10GE (LAN/WAN) SFPP

```

### show chassis fpc (QFX Series and OCX Series)

```
user@switch> show chassis fpc
```

Temp	CPU	Utilization (%)	Memory	Utilization (%)			
Slot	State	(C)	Total	Interrupt	DRAM (MB)	Heap	Buffer
0	Online	26	2	0	2820	0	49

### show chassis fpc detail (QFX3500 Switches)

```
user@switch> show chassis fpc detail
```

```

Slot 0 information:
  State                Online
  Temperature          28 degrees C / 82 degrees F
  Total CPU DRAM       2820 MB
  Total SRAM           0 MB
  Total SDRAM          0 MB
  Start time           2010-09-20 01:34:13 PDT
  Uptime               3 days, 3 hours, 31 minutes, 48 seconds

```

### show chassis fpc pic-status (QFX3500 Switches)

```
user@switch> show chassis fpc pic-status
```

```

Slot 0  Online      QFX 48x10G 4x40G Switch
PIC 0   Online      48x 10G-SFP+
PIC 1   Online      15x 10G-SFP+

```

### show chassis fpc interconnect-device (QFabric System)

```
user@switch> show chassis fpc interconnect-device interconnect1
```

```

FPC status:
Slot State      Temp
              (C)
0  Online       0
1  Online       0
2  Online       0
3  Online       0
4  Online       0
5  Online       0
6  Online       0
7  Online       0
8  Online       0
9  Online       0
10 Online       0
11 Online       0
12 Online       0

```

```

13 Online      0
14 Online      0
15 Online      0

```

### show chassis fpc interconnect-device (QFabric System)

```
user@switch> show chassis fpc interconnect-device interconnect1 3
```

```

FPC status:
Slot State      Temp
          (C)
  3 Online      0

```

### show chassis fpc interconnect-device detail (QFabric System)

```
user@switch> show chassis fpc interconnect-device interconnect1 3 detail
```

```

Slot 3 information:
State                      Online
Temperature                 0 degrees C / 32 degrees F
Start time                  2011-08-18 10:45:04 PDT
Uptime                      1 minute, 49 seconds

```

### show chassis fpc pic-status interconnect-device (QFabric System)

```
user@switch> show chassis fpc pic-status interconnect-device interconnect1
```

```

Slot 0 Online      QFX 16-port QSFP+ Front Card
    PIC 0 Online    16x 40G-QSFP+
    PIC 1 Online    16x 40G-GE
Slot 1 Online      QFX 16-port QSFP+ Front Card
    PIC 0 Online    16x 40G-QSFP+
    PIC 1 Online    16x 40G-GE
Slot 2 Online      QFX 16-port QSFP+ Front Card
    PIC 0 Online    16x 40G-QSFP+
    PIC 1 Online    16x 40G-GE
Slot 3 Online      QFX 16-port QSFP+ Front Card
    PIC 0 Online    16x 40G-QSFP+
    PIC 1 Online    16x 40G-GE
Slot 4 Online      QFX 16-port QSFP+ Front Card
    PIC 0 Online    16x 40G-QSFP+
    PIC 1 Online    16x 40G-GE
Slot 5 Online      QFX 16-port QSFP+ Front Card
    PIC 0 Online    16x 40G-QSFP+
    PIC 1 Online    16x 40G-GE
Slot 6 Online      QFX 16-port QSFP+ Front Card
    PIC 0 Online    16x 40G-QSFP+
    PIC 1 Online    16x 40G-GE
Slot 7 Online      QFX 16-port QSFP+ Front Card
    PIC 0 Online    16x 40G-QSFP+
    PIC 1 Online    16x 40G-GE
Slot 8 Online      QFX Fabric Rear Card
    PIC 0 Online    16x 40G-GE
Slot 9 Online      QFX Fabric Rear Card
    PIC 0 Online    16x 40G-GE
Slot 10 Online     QFX Fabric Rear Card
    PIC 0 Online    16x 40G-GE
Slot 11 Online     QFX Fabric Rear Card
    PIC 0 Online    16x 40G-GE

```



```

Slot 12 Online      QFX Fabric Rear Card
PIC 0 Online       16x 40G-GE
Slot 13 Online      QFX Fabric Rear Card
PIC 0 Online       16x 40G-GE
Slot 14 Online      QFX Fabric Rear Card
PIC 0 Online       16x 40G-GE
Slot 15 Online      QFX Fabric Rear Card
PIC 0 Online       16x 40G-GE

```

### show chassis fpc pic-status node-device (QFabric System)

```
user@switch> show chassis fpc pic-status node-device node1
```

```

Slot node1 Online      QFX 48x10G 4x40G Switch
PIC 0 Online          48x 10G-SFP+
PIC 1 Online          4x 40G-QSFP+

```

### show chassis fpc (PTX5000 Packet Transport Router)

```
user@host> show chassis fpc
```

Slot	State	Temp (C)	CPU Utilization (%) Total Interrupt	Memory DRAM (MB)	Utilization (%) Heap Buffer
0	Empty				
1	Empty				
2	Online	50	6 0	2816	5 27
3	Empty				
4	Empty				
5	Online	48	9 0	2816	5 27
6	Empty				
7	Online	49	8 0	2816	5 27

### show chassis fpc detail (PTX5000 Packet Transport Router)

```
user@host> show chassis fpc detail
```

```

Slot 2 information:
State                               Online
Temperature                         35 degrees C / 95 degrees F (PMB)
Temperature                         35 degrees C / 95 degrees F (Intake)
Temperature                         50 degrees C / 122 degrees F (Exhaust A)
Temperature                         54 degrees C / 129 degrees F (Exhaust B)
Temperature                         54 degrees C / 129 degrees F (TL0)
Temperature                         52 degrees C / 125 degrees F (TQ0)
Temperature                         61 degrees C / 141 degrees F (TL1)
Temperature                         58 degrees C / 136 degrees F (TQ1)
Temperature                         57 degrees C / 134 degrees F (TL2)
Temperature                         58 degrees C / 136 degrees F (TQ2)
Temperature                         62 degrees C / 143 degrees F (TL3)
Temperature                         61 degrees C / 141 degrees F (TQ3)
Total CPU DRAM                      2816 MB
Total SRAM                          0 MB
Total SDRAM                         0 MB
Start time                          2012-01-12 12:05:42 PST
Uptime                              3 hours, 14 minutes, 7 seconds

Slot 5 information:
State                               Online
Temperature                         35 degrees C / 95 degrees F (PMB)

```

```

Temperature          34 degrees C / 93 degrees F (Intake)
Temperature          48 degrees C / 118 degrees F (Exhaust A)
Temperature          53 degrees C / 127 degrees F (Exhaust B)
Temperature          54 degrees C / 129 degrees F (TL0)
Temperature          52 degrees C / 125 degrees F (TQ0)
Temperature          69 degrees C / 156 degrees F (TL1)
Temperature          56 degrees C / 132 degrees F (TQ1)
Temperature          54 degrees C / 129 degrees F (TL2)
Temperature          56 degrees C / 132 degrees F (TQ2)
Temperature          59 degrees C / 138 degrees F (TL3)
Temperature          60 degrees C / 140 degrees F (TQ3)
Total CPU DRAM       2816 MB
Total SRAM            0 MB
Total SDRAM           0 MB
Start time           2012-01-12 12:05:43 PST
Uptime               3 hours, 14 minutes, 6 seconds
Slot 7 information:
State                Online
Temperature          35 degrees C / 95 degrees F (PMB)
Temperature          33 degrees C / 91 degrees F (Intake)
Temperature          50 degrees C / 122 degrees F (Exhaust A)
Temperature          55 degrees C / 131 degrees F (Exhaust B)
Temperature          56 degrees C / 132 degrees F (TL0)
Temperature          56 degrees C / 132 degrees F (TQ0)
Temperature          61 degrees C / 141 degrees F (TL1)
Temperature          57 degrees C / 134 degrees F (TQ1)
Temperature          55 degrees C / 131 degrees F (TL2)
Temperature          59 degrees C / 138 degrees F (TQ2)
Temperature          62 degrees C / 143 degrees F (TL3)
Temperature          62 degrees C / 143 degrees F (TQ3)
Total CPU DRAM       2816 MB
Total SRAM            0 MB
Total SDRAM           0 MB
Start time           2012-01-12 12:05:44 PST
Uptime               3 hours, 14 minutes, 5 seconds

```

### show chassis fpc pic-status (PTX5000 Packet Transport Router)

```

user@host> show chassis fpc pic-status

Slot 2  Online      FPC
  PIC 0  Online      24x 10GE(LAN) SFP+
  PIC 1  Online      24x 10GE(LAN) SFP+
Slot 5  Online      FPC
  PIC 0  Online      24x 10GE(LAN) SFP+
  PIC 1  Online      2x 40GE CFP
Slot 7  Online      FPC
  PIC 0  Online      24x 10GE(LAN) SFP+
  PIC 1  Online      2x 40GE CFP

```

### show chassis fpc (PTX10008 Router)

```

user@host> show chassis fpc

```

		Temp	CPU Utilization (%)		CPU Utilization (%)			Memory
Utilization (%)		(C)	Total	Interrupt	1min	5min	15min	DRAM (MB)
Slot State								
Heap	Buffer							
0	Online	38	26	2	26	26	26	1953

```

20      32
1 Empty
2 Empty
3 Empty
4 Empty
5 Online      67      26      2      26      26      26      1953
25      32
6 Online      52      26      2      26      26      26      1953
25      32
7 Empty

```

### show chassis fpc detail (PTX10008 Router)

```
user@host> show chassis fpc detail
```

```

Slot 6 information:
  State                Online
  Total CPU DRAM        8192 MB
  Temperature           42 degrees C / 107 degrees F
  Start time            2018-09-17 02:42:16 PDT
  Uptime                53 minutes, 40 seconds
  Max power consumption 675 Watts
Slot 7 information:
  State                Online
  Total CPU DRAM        8192 MB
  Temperature           51 degrees C / 123 degrees F
  Start time            2018-09-17 02:42:26 PDT
  Uptime                53 minutes, 30 seconds
  Max power consumption 1150 Watts

```

### show chassis fpc (PTX10016 Router)

```
user@host> show chassis fpc
```

Utilization (%)		Temp	CPU Utilization (%)		CPU Utilization (%)			Memory
Slot	State	(C)	Total	Interrupt	1min	5min	15min	DRAM (MB)
0	Empty							
1	Online	36	27	2	27	27	27	1953
22	32							
2	Empty							
3	Online	36	27	2	27	27	27	1953
22	32							
4	Empty							
5	Empty							
6	Online	35	27	2	27	27	27	1953
22	32							
7	Empty							
8	Online	34	27	2	27	27	27	1953
22	32							
9	Online	46	24	2	24	24	24	1953
26	32							
10	Empty							
11	Empty							
12	Empty							
13	Empty							

```

14 Empty
15 Empty

```

### show chassis fpc detail (PTX10016 Router)

```
user@host> show chassis fpc detail
```

```

Slot 0 information:
  State                               Online
  Total CPU DRAM                      8192 MB
  Temperature                         44 degrees C / 111 degrees F
  Start time                         2018-09-10 07:01:09 PDT
  Uptime                             6 days, 23 hours, 17 minutes, 9 seconds
  Max power consumption               1150 Watts
Slot 4 information:
  State                               Online
  Total CPU DRAM                      8192 MB
  Temperature                         40 degrees C / 104 degrees F
  Start time                         2018-09-10 07:01:17 PDT
  Uptime                             6 days, 23 hours, 17 minutes, 1 second
  Max power consumption               1150 Watts
Slot 6 information:
  State                               Online
  Total CPU DRAM                      8192 MB
  Temperature                         42 degrees C / 107 degrees F
  Start time                         2018-09-10 07:01:27 PDT
  Uptime                             6 days, 23 hours, 16 minutes, 51 seconds
  Max power consumption               1150 Watts
Slot 7 information:
  State                               Online
  Total CPU DRAM                      8192 MB
  Temperature                         41 degrees C / 105 degrees F
  Start time                         2018-09-10 07:01:32 PDT
  Uptime                             6 days, 23 hours, 16 minutes, 46 seconds
  Max power consumption               1150 Watts
Slot 9 information:
  State                               Online
  Total CPU DRAM                      16384 MB
  Temperature                         42 degrees C / 107 degrees F
  Start time                         2018-09-10 07:01:45 PDT
  Uptime                             6 days, 23 hours, 16 minutes, 33 seconds
  Max power consumption               1150 Watts
Slot 10 information:
  State                               Online
  Total CPU DRAM                      8192 MB
  Temperature                         41 degrees C / 105 degrees F
  Start time                         2018-09-10 07:01:46 PDT
  Uptime                             6 days, 23 hours, 16 minutes, 32 seconds
  Max power consumption               1150 Watts
Slot 11 information:
  State                               Online
  Total CPU DRAM                      16384 MB
  Temperature                         40 degrees C / 104 degrees F
  Start time                         2018-09-10 07:01:55 PDT
  Uptime                             6 days, 23 hours, 16 minutes, 23 seconds
  Max power consumption               1150 Watts
Slot 14 information:
  State                               Online
  Total CPU DRAM                      8192 MB

```

```

Temperature                42 degrees C / 107 degrees F
Start time                 2018-09-10 07:01:54 PDT
Uptime                     6 days, 23 hours, 16 minutes, 24 seconds
Max power consumption      1150 Watts
Slot 15 information:
State                      Online
Total CPU DRAM             16384 MB
Temperature                41 degrees C / 105 degrees F
Start time                 2018-09-10 07:02:03 PDT
Uptime                     6 days, 23 hours, 16 minutes, 15 seconds
Max power consumption      1150 Watts

```

### show chassis fpc (ACX2000 Universal Metro Router)

```
user@host> show chassis fpc
```

Slot	State	Temp (C)	CPU Utilization (%)	Memory	Utilization (%)
			Total Interrupt	DRAM (MB)	Heap Buffer
0	Online	61	17 6	512	21 37

### show chassis fpc 0 (ACX2000 Universal Metro Router)

```
user@host> show chassis fpc 0
```

Slot	State	Temp (C)	CPU Utilization (%)	Memory	Utilization (%)
			Total Interrupt	DRAM (MB)	Heap Buffer
0	Online	61	17 6	512	21 37

### show chassis fpc detail (ACX2000 Universal Metro Router)

```
user@host> show chassis fpc detail
```

```

Slot 0 information:
State                      Online
Temperature                61 degrees C / 141 degrees F
Total CPU DRAM             512 MB
Start time                 2012-05-29 02:52:06 PDT
Uptime                     27 minutes, 17 seconds

```

### show chassis fpc pic-status (ACX2000 Universal Metro Router)

```
user@host> show chassis fpc pic-status
```

```

Slot 0  Online
PIC 0  Online    16x CHE1T1, RJ48
PIC 1  Online    8x 1GE(LAN) RJ45
PIC 2  Online    2x 1GE(LAN) SFP
PIC 3  Online    2x 10GE(LAN) SFP+

```

### show chassis FPC 1 (MX Routers with Media Services Blade [MSB])

```
user@switch> show chassis fpc 1
```

Slot	State	Temp (C)	CPU Utilization (%)	Memory	Utilization (%)
			Total Interrupt	DRAM (MB)	Heap Buffer
1	Online	34	5 0	3072	5 13

**show chassis fpc 1 detail (MX Routers with Media Services Blade [MSB])**

```
user@switch> show chassis fpc 1 detail
```

```
Slot 1 information:
State                               Online
Temperature                         34
Total CPU DRAM                     3072 MB
Total RLDRAM                       259 MB
Total DDR DRAM                     4864 MB
Start time:                        2012-06-19 10:51:43 PDT
Uptime:                            16 minutes, 48 seconds
Max Power Consumption               550 Watts
```

**Sample Output****show chassis fpc (Node Slicing)**

```
user@router>show chassis fpc
```

Utilization (%)	Temp	CPU Utilization (%)	CPU Utilization (%)	Memory
Slot State	(C)	Total	Interrupt	1min 5min 15min DRAM (MB)
Heap Buffer	GNF			
0 Online	45	12	0	12 12 12 3584
6 25	3			
1 Online	57	22	0	20 20 20 3136
16 22	2			
2 Online	50	19	0	17 17 16 3584
6 25	3			
3 Online	28	10	0	11 11 11 2048
10 20	6			
4 Online	42	20	0	20 19 19 3584
8 25	6			
5 Online	58	22	0	21 20 20 3136
16 22	4			
6 Online	49	17	0	15 16 16 3136
13 20	1			
7 Online	44	11	0	10 10 10 3584
6 25	5			
8 Online	40	19	0	18 18 18 3584
8 25	5			
9 Online	44	19	0	20 20 20 3584
8 25	5			

**Sample Output****show chassis fpc pic-status (Node Slicing)**

```
user@router> show chassis fpc pic-status
```

Slot 0	Online	MPC5E 3D 24XGE+6XLGE	GNF 3
PIC 0	Online	12X10GE SFPP OTN	
PIC 1	Offline	12X10GE SFPP OTN	
PIC 2	Offline	3X40GE QSFPP	
PIC 3	Online	3X40GE QSFPP	
Slot 1	Online	MPC9E 3D	GNF 2

PIC 1	Online	MRATE-12xQSFP-XGE-XLGE-CGE	
Slot 2	Online	MPC5E 3D Q 2CGE+4XGE	GNF 3
PIC 0	Online	2X10GE SFPP OTN	
PIC 1	Online	1X100GE CFP2 OTN	
PIC 2	Online	2X10GE SFPP OTN	
PIC 3	Online	1X100GE CFP2 OTN	
Slot 3	Online	MPCE Type 2 3D EQ	GNF 6
Slot 4	Online	MPC6E 3D	GNF 6
PIC 0	Online	24X10GE SFPP	
PIC 1	Online	2X100GE CFP2 OTN	
Slot 5	Online	MPC9E 3D	GNF 4
PIC 0	Online	MRATE-12xQSFP-XGE-XLGE-CGE	
Slot 6	Online	MPC7E 3D MRATE-12xQSFP-XGE-XLGE-CGE	GNF 1
PIC 0	Online	MRATE-6xQSFP-XGE-XLGE-CGE	
PIC 1	Online	MRATE-6xQSFP-XGE-XLGE-CGE	
Slot 7	Online	MPC5E 3D 2CGE+4XGE	GNF 5
PIC 0	Online	2X10GE SFPP OTN	
PIC 1	Online	1X100GE CFP2 OTN	
PIC 2	Online	2X10GE SFPP OTN	
PIC 3	Online	1X100GE CFP2 OTN	
Slot 8	Online	MPC6E 3D	GNF 5
PIC 0	Online	24X10GE SFPP OTN	
Slot 9	Online	MPC6E 3D	GNF 5
PIC 0	Online	24X10GE SFPP	
PIC 1	Online	4X100GE CXP	

## show chassis fpc errors

**Syntax** `show chassis fpc errors;`  
`<fpc-slot scope error-scope category category>`

**Release Information** Command introduced in Junos OS Release 12.3 for the T Series routers.  
 Command introduced in Junos OS Release 13.3 for the PTX Series routers.  
 Command introduced in Junos OS Release 14.2 for the MX240, MX480, MX960, and MX2020 routers.  
 The `fpc-slot`, `scope`, and `category` options introduced in Junos OS Release 18.1R1.

**Description** Display chassis error information including FPC number, severity of error, error scope, category, number of error occurred, cleared, threshold, and corresponding action.

Error Severity Level	Default Threshold	Default Action
Fatal	1	Restart the FPC
Major	1	Get the current state of the FPC and raise an alarm.
Minor	10	Write a log for the event.

**Options** `fpc-slot`—Show the errors by FPC.

`scope error-scope`—Filter the errors by error scope. An error scope provides a deeper level of classification of the errors. The available scopes are `pfe` and `board`. Example: `show chassis fpc errors 2 scope pfe`

`category category`—Filter the errors by error category. An error category is used to categorize errors into various subgroups under the scope level. Therefore, the option `category` needs to be used under the `scope` filter. Example: `show chassis fpc errors 2 scope pfe category io`. Some of the categories are `functional`, `io`, `memory`, `processing`, `storage`, and `switch`.

**Required Privilege Level** view

**Related Documentation**

- [fpc error on page 659](#)

**List of Sample Output** [show chassis fpc errors on page 1719](#)  
[show chassis fpc errors \(output filtered by error scope\) on page 1721](#)  
[show chassis fpc errors \(output filtered by error category\) on page 1721](#)  
[show chassis fpc errors \(QFX10002, QFX10008, and QFX10016 Switches\) on page 1721](#)



**Output Fields** Table 140 on page 1719 lists the output fields for the **show chassis fpc errors** command. Output fields are listed in the approximate order in which they appear.

*Table 140: show chassis fpc errors Output Fields*

Field Name	Field Description
FPC	The FPC number.
Level	The severity of the error. It can be configured as follows: <ul style="list-style-type: none"> <li>• <b>fatal</b>—Fatal error on FPC</li> <li>• <b>major</b>—Major error on FPC</li> <li>• <b>minor</b>—Minor error on FPC</li> </ul>
Occurred	Number of error instances occurred.
Cleared	Number of error instances cleared.
Threshold	Configured threshold value. The associated detection and recovery actions are triggered when this threshold value is crossed.
Action	The detection and recovery actions that are triggered when the threshold value is crossed. <ul style="list-style-type: none"> <li>• Restart the FPC.</li> <li>• Get the current state of the FPC and raise an alarm.</li> <li>• Write a log for the event.</li> </ul>

## Sample Output

### show chassis fpc errors

```
user@host> show chassis fpc errors
```

FPC	Scope	Category	Level	Occurred	Cleared	Threshold	Action-Taken	Action
1	board	functional	Minor	4	4	10	2	LOG
			Major	0	0	1	0	LOG CM ALA
						RM		
		memory	Fatal	0	0	1	0	RESET
			Minor	0	0	10	0	LOG
			Major	0	0	1	0	CM ALARM D
						ISABLE PFE		
		io	Fatal	0	0	1	0	RESET
			Minor	0	0	10	0	LOG
			Major	0	0	1	0	CM ALARM D
						ISABLE PFE		
		storage	Fatal	0	0	1	0	RESET
			Minor	0	0	10	0	LOG
			Major	0	0	1	0	CM ALARM D
						ISABLE PFE		
		switch	Fatal	0	0	1	0	RESET
			Minor	0	0	10	0	LOG

			Major	0	0	1	0	CM	ALARM D
			ISABLE PFE						
ALARM DISABLE	processing	Fatal	0	0	1	0	RESET		
		Minor	0	0	10	0	LOG		
		Major	0	0	1	0	CM		
ALARM DISABLE PFE									
pfe	functional	Fatal	0	0	1	0	RESET		
		Minor	0	0	10	0	LOG		
		Major	0	0	1	0	CM		
ALARM DISABLE PFE									
	memory	Fatal	0	0	1	0	RESET		
		Minor	0	0	10	0	LOG		
		Major	0	0	1	0	CM		
ALARM DISABLE PFE									
	io	Fatal	0	0	1	0	RESET		
		Minor	0	0	10	0	LOG		
		Major	0	0	1	0	CM		
ALARM DISABLE PFE									
	storage	Fatal	0	0	1	0	RESET		
		Minor	0	0	10	0	LOG		
		Major	0	0	1	0	CM		
ALARM DISABLE PFE									
	switch	Fatal	0	0	1	0	RESET		
		Minor	0	0	10	0	LOG		
		Major	0	0	1	0	CM		
ALARM DISABLE PFE									
	processing	Fatal	0	0	1	0	RESET		
		Minor	0	0	10	0	LOG		
		Major	0	0	1	0	CM		
ALARM DISABLE PFE									
2 board	functional	Fatal	0	0	1	0	RESET		
		Pfe-State: pfe-0 -ENABLED   pfe-1 -ENABLED	4	4	10	2	LOG		
		Minor	1	0	1	1	LOG CM		
ALARM									
	memory	Fatal	0	0	1	0	RESET		
		Minor	0	0	10	0	LOG		
		Major	0	0	1	0	CM		
ALARM DISABLE PFE									
	io	Fatal	0	0	1	0	RESET		
		Minor	0	0	10	0	LOG		
		Major	0	0	1	0	CM		
ALARM DISABLE PFE									
	storage	Fatal	0	0	1	0	RESET		
		Minor	0	0	10	0	LOG		
		Major	0	0	1	0	CM		
ALARM DISABLE PFE									
	switch	Fatal	0	0	1	0	RESET		
		Minor	0	0	10	0	LOG		
		Major	0	0	1	0	CM		
ALARM DISABLE PFE									
	processing	Fatal	0	0	1	0	RESET		
		Minor	1	1	10	1	LOG		
		Major	0	0	1	0	CM		
ALARM DISABLE PFE									
pfe	functional	Fatal	0	0	1	0	RESET		
		Minor	0	0	10	0	LOG		
		Major	0	0	1	0	CM		

ALARM DISABLE PFE	Fatal	0	0	1	0	RESET
-------------------	-------	---	---	---	---	-------

### show chassis fpc errors (output filtered by error scope)

```
user@host> show chassis fpc errors 2 scope pfe
```

FPC Scope	Category	Level	Occurred	Cleared	Threshold	Action-Taken	Action
2 pfe	functional	Minor	0	0	1	0	LOG CM ALA
	RM	Major	0	0	1	0	CM ALARM D
	ISABLE PFE	Fatal	0	0	1	0	RESET
	memory	Minor	0	0	1	0	LOG CM ALA
	RM	Major	0	0	1	0	CM ALARM D
	ISABLE PFE	Fatal	0	0	1	0	RESET
	io	Minor	0	0	1	0	LOG CM ALA
	RM	Major	0	0	1	0	CM ALARM D
	ISABLE PFE	Fatal	0	0	1	0	RESET
	storage	Minor	0	0	1	0	LOG CM ALA
	RM	Major	0	0	1	0	CM ALARM D
	ISABLE PFE	Fatal	0	0	1	0	RESET
	switch	Minor	0	0	1	0	LOG CM ALA
	RM	Major	0	0	1	0	CM ALARM D
	ISABLE PFE	Fatal	0	0	1	0	RESET
	processing	Minor	0	0	1	0	LOG CM ALA
	RM	Major	0	0	1	0	CM ALARM D
	ISABLE PFE	Fatal	0	0	1	0	RESET

### show chassis fpc errors (output filtered by error category)

```
user@host> show chassis fpc errors 2 scope pfe category io
```

FPC Scope	Category	Level	Occurred	Cleared	Threshold	Action-Taken	Action
2 pfe	io	Minor	0	0	1	0	LOG CM
ALARM		Major	0	0	1	0	CM
ALARM DISABLE PFE		Fatal	0	0	1	0	RESET

### show chassis fpc errors (QFX10002, QFX10008, and QFX10016 Switches)

```
user@host> show chassis fpc errors
```

FPC Scope	Category	Level	Occurred	Cleared	Threshold	Action-Taken	Action
0 board	functional	Minor	0	0	10	0	LOG
		Major	0	0	15	0	CM ALARM
		Fatal	0	0	1	0	CM

ALARM DISABLE PFE							
memory	Minor	0	0	10	0	LOG	
	Major	0	0	15	0	CM ALARM	
	Fatal	0	0	1	0	CM	
ALARM DISABLE PFE							
io	Minor	0	0	10	0	LOG	
	Major	0	0	15	0	CM ALARM	
	Fatal	0	0	1	0	CM	
ALARM DISABLE PFE							
storage	Minor	0	0	10	0	LOG	
	Major	0	0	15	0	CM ALARM	
	Fatal	0	0	1	0	CM	
ALARM DISABLE PFE							
switch	Minor	0	0	10	0	LOG	
	Major	0	0	15	0	CM ALARM	
	Fatal	0	0	1	0	CM	
ALARM DISABLE PFE							
processing	Minor	0	0	10	0	LOG	
	Major	0	0	15	0	CM ALARM	
	Fatal	0	0	1	0	CM	
ALARM DISABLE PFE							
pfe functional	Minor	0	0	10	0	LOG	
	Major	0	0	15	0	CM ALARM	
	Fatal	0	0	1	0	CM	
ALARM DISABLE PFE							
memory	Minor	0	0	10	0	LOG	
	Major	0	0	15	0	CM ALARM	
	Fatal	0	0	1	0	CM	
ALARM DISABLE PFE							
io	Minor	0	0	10	0	LOG	
	Major	0	0	15	0	CM ALARM	
	Fatal	0	0	1	0	CM	
ALARM DISABLE PFE							
storage	Minor	0	0	10	0	LOG	
	Major	0	0	15	0	CM ALARM	
	Fatal	0	0	1	0	CM	
ALARM DISABLE PFE							
switch	Minor	0	0	10	0	LOG	
	Major	0	0	15	0	CM ALARM	
	Fatal	0	0	1	0	CM	
ALARM DISABLE PFE							
processing	Minor	0	0	10	0	LOG	
	Major	0	0	15	0	CM ALARM	
	Fatal	0	0	1	0	CM	
ALARM DISABLE PFE							

## show chassis fpc-feb-connectivity

<b>Syntax</b>	show chassis fpc-feb-connectivity
<b>Release Information</b>	Command introduced in Junos OS Release 8.0.
<b>Description</b>	(M120 router only) Display the Flexible PIC Concentrator (FPC) and Forwarding Engine Board (FEB) mapping and their respective states.
<b>Options</b>	This command has no options.
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">request chassis fpc on page 858</a></li> <li>• <a href="#">show chassis fpc on page 1666</a></li> <li>• <a href="#">show chassis fabric fpcs on page 1412</a></li> <li>• <a href="#">Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 479</a></li> <li>• <a href="#">MX960 Flexible PIC Concentrator Description</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">show chassis fpc-feb-connectivity on page 1724</a>
<b>Output Fields</b>	<a href="#">Table 141 on page 1723</a> lists the output fields for the <b>show chassis fpc-feb-connectivity</b> command. Output fields are listed in the approximate order in which they appear.

*Table 141: show chassis fpc-feb-connectivity Output Fields*

Field Name	Field Description
FPC	Slot number of the Flexible PIC Concentrator (FPC).
FPC type	Type of FPC: <b>Type 1</b> , <b>Type 2</b> , <b>Type 3</b> , or <b>cFPC</b> .

Table 141: show chassis fpc-feb-connectivity Output Fields (continued)

Field Name	Field Description
<b>FPC state</b>	<p>State of the FPC. State can be any of the following:</p> <ul style="list-style-type: none"> <li>• <b>Announce offline</b>—Intermediate state where FPC is going down but is not offline and the Chassis manager acknowledges that the FPC is in the process of going offline.</li> <li>• <b>Announce online</b>—Intermediate state where FPC is coming up but is not online and the Chassis manager acknowledges that the FPC is in the process of coming online.</li> <li>• <b>Empty</b>—No FPC is present.</li> <li>• <b>Offline</b>—FPC is powered down.</li> <li>• <b>Online</b>—FPC is online and running.</li> <li>• <b>Present</b>—The chassis process has detected the FPC, but the FPC is either not supported by the current version of the Junos OS or FPC is coming up but is not online.</li> <li>• <b>Ready</b>—FPC is in transition state.</li> </ul>
<b>Connected FEB</b>	Slot number of the Forwarding Engine Board (FEB) connected to the FPC or <b>None</b> if the FPC is not connected to a FEB.
<b>FEB state</b>	<p>State of the FEB. State can be any of the following:</p> <ul style="list-style-type: none"> <li>• <b>Announce offline</b>—Intermediate state where FEB is going down but is not offline and the Chassis manager acknowledges that the FEB is in the process of going offline.</li> <li>• <b>Announce online</b>—Intermediate state where FEB is coming up but is not online and the Chassis manager acknowledges that the FEB is in the process of coming online.</li> <li>• <b>Empty</b>—No FEB is present.</li> <li>• <b>Offline</b>—FEB is powered down.</li> <li>• <b>Online</b>—FEB is online and running.</li> <li>• <b>Present</b>—The chassis process has detected the FEB, but the FEB is either not supported by the current version of the Junos OS or FEB is coming up but is not online.</li> <li>• <b>Ready</b>—FEB is in transition state.</li> </ul>
<b>Link status</b>	<p>Status of the link connecting the R-FEB and R-FPC:</p> <ul style="list-style-type: none"> <li>• <b>Error</b></li> <li>• <b>Misconfiguration</b>—Configuration between the R-FEB and the F-FPC is incorrect.</li> <li>• <b>OK</b></li> </ul>

## Sample Output

### show chassis fpc-feb-connectivity

```
user@host> show chassis fpc-feb-connectivity
```

```

FPC  FPC type  FPC state    Connected FEB  FEB state    Link status
0    cFPC      Online       0              Empty
1    cFPC      Online       1              Online       OK
2    Type 3   Online       3              Online       OK
3    Type 2   Online       None
4    Type 1   Online       4              Online       OK
5    Type 3   Online       None
FIFO errors: 0, HS link CRC errors: 0, MTU errors: 0, Resource errors: 0
```

```
Egress queues: 8 supported, 8 in use
Queue counters:      Queued packets  Transmitted packets  Dropped packets

  0 best-effort      0              0              0
  1 expedited-fo     0              0              0
  2 assured-forw     0              0              0
  3 network-cont     0              0              0

Active alarms : PLL, LOS, LINK
Active defects : PLL, LOF, LOS, SEF, LOP, BERR-SF, PLM-P, LINK
PCS statistics      Seconds
  Bit errors        0
  Errored blocks    3
MAC statistics:      Receive      Transmit
  Total octets      0            0
  Total packets     0            0
```

## show chassis hardware

- List of Syntax**
- Syntax on page 1726
  - Syntax (EX Series) on page 1726
  - Syntax (T4000 Router) on page 1726
  - Syntax (TX Matrix Router) on page 1726
  - Syntax (TX Matrix Plus Router) on page 1726
  - Syntax (MX Series Routers) on page 1727
  - Syntax (MX104, MX204, MX2010, MX2020, MX10003, MX10008, and MX2008 Universal Routing Platforms) on page 1727
  - Syntax (QFX Series) on page 1727
  - Syntax (OCX Series) on page 1727
  - Syntax (PTX Series Packet Transport Routers) on page 1727
  - Syntax (ACX Series Universal Metro Routers) on page 1727
  - Syntax (ACX5048 and ACX5096 Routers) on page 1727
  - Syntax (ACX500 Routers) on page 1727

**Syntax**

```
show chassis hardware
<detail | extensive>
<clei-models>
<models>
```

**Syntax (EX Series)**

```
show chassis hardware
<clei-models>
<detail | extensive>
<models>
<satellite [slot-id slot-id | device-alias alias-name]>
```

**Syntax (T4000 Router)**

```
show chassis hardware
<clei-models>
<detail | extensive>
<models>
```

**Syntax (TX Matrix Router)**

```
show chassis hardware
<clei-models>
<detail | extensive>
<models>
<lcc number | scc>
```

**Syntax (TX Matrix Plus Router)**

```
show chassis hardware
<clei-models>
<detail | extensive>
<models>
<lcc number | sfc number>
```



Syntax (MX Series Routers)	<pre>show chassis hardware &lt;detail   extensive&gt; &lt;clei-models&gt; &lt;models&gt; &lt;all-members&gt; &lt;local&gt; &lt;member <i>member-id</i>&gt;</pre>
Syntax (MX104, MX204, MX2010, MX2020, MX10003, MX10008, and MX2008 Universal Routing Platforms)	<pre>show chassis hardware &lt;clei-models&gt; &lt;detail   extensive&gt; &lt;models&gt; &lt;satellite [<i>slot-id slot-id</i>   <i>device-alias alias-name</i>]&gt;</pre>
Syntax (QFX Series)	<pre>show chassis hardware &lt;detail   extensive&gt; &lt;clei-models&gt; &lt;interconnect-device <i>name</i>&gt; &lt;node-device <i>name</i>&gt; &lt;models&gt;</pre>
Syntax (OCX Series)	<pre>show chassis hardware &lt;detail   extensive&gt; &lt;clei-models&gt; &lt;models&gt;</pre>
Syntax (PTX Series Packet Transport Routers)	<pre>show chassis hardware &lt;detail   extensive&gt; &lt;clei-models&gt; &lt;models&gt;</pre>
Syntax (ACX Series Universal Metro Routers)	<pre>show chassis hardware &lt;detail   extensive&gt; &lt;clei-models&gt; &lt;models&gt;</pre>
Syntax (ACX5048 and ACX5096 Routers)	<pre>show chassis hardware &lt;detail   extensive&gt; &lt;clei-models&gt; &lt;models&gt;</pre>
Syntax (ACX500 Routers)	<pre>show chassis hardware &lt;detail   extensive&gt; &lt;clei-models&gt;</pre>

<models>

<b>Release Information</b>	<p>Command introduced before Junos OS Release 7.4.</p> <p><b>models</b> option introduced in Junos OS Release 8.2.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p><b>sfc</b> option introduced in Junos OS Release 9.6 for the TX Matrix Plus router.</p> <p>Command introduced in Junos OS Release 11.1 for QFX Series.</p> <p>Command introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport Routers.</p> <p>Command introduced in Junos OS Release 12.2 for ACX Series Universal Metro Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 and MX2020 Universal Routing Platforms.</p> <p>Information for <b>disk</b> and <b>usb</b> introduced in Junos OS Release 15.1X53-D60 for QFX10002, QFX10008, and QFX10016 switches.</p> <p>Command introduced in Junos OS Release 15.1X54-D20 for ACX5048 and ACX5096 Routers.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.2 for PTX10008 Routers.</p> <p>Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.3 for MX150 Router Appliance.</p> <p>Command introduced in Junos OS Release 17.4 for MX204 Routers.</p> <p>Command introduced in Junos OS Release 18.1R1 for EX9251 Switches.</p> <p>Command introduced in Junos OS Release 18.2 for EX9253 Switches.</p> <p>Command introduced in Junos OS Release 18.2R1 for MX10008 Routers</p>
<b>Description</b>	<p>Display a list of all Flexible PIC Concentrators (FPCs) and PICs installed in the router or switch chassis, including the hardware version level and serial number.</p> <p>In the EX Series switch command output, FPC refers to the following:</p> <ul style="list-style-type: none"> <li>On EX2200 switches, EX3200 switches, EX4200 standalone switches, and EX4500 switches—Refers to the switch; FPC <i>number</i> is always 0.</li> <li>On EX4200 switches in a Virtual Chassis configuration—Refers to the member of a Virtual Chassis; FPC <i>number</i> equals the member ID, from 0 through 9.</li> <li>On EX8208 and EX8216 switches—Refers to a line card; FPC <i>number</i> equals the slot number for the line card.</li> </ul> <p>On QFX3500, QFX5100, and OCX Series standalone switches, and PTX1000 routers both the FPC and FPC <i>number</i> are always 0.</p> <p>On T4000 Type 5 FPCs, there are no <b>top temperature sensor</b> or <b>bottom temperature sensor</b> parameters. Instead, <b>fan intake temperature sensor</b> and <b>fan exhaust temperature sensors</b> parameters are displayed.</p> <p>Starting from Junos OS Release 11.4, the output of the <b>show chassis hardware models</b> operational mode command displays the enhanced midplanes FRU model numbers (CHAS-BP3-MX240-S, CHAS-BP3-MX480-S or CHAS-BP3-MX960-S) based on the router. Prior to release 11.4, the FRU model numbers are left blank when the router has</p>

enhanced midplanes. Note that the enhanced midplanes are introduced through the Junos OS Release 13.3, but can be supported on all Junos OS releases.

Starting with Junos OS Release 14.1, the output of the **show chassis hardware detail | extensive | clei-models | models** operational mode command displays the new DC power supply module (PSM) and power distribution unit (PDU) that are added to provide power to the high-density FPC (FPC2-PTX-P1A) and other components in a PTX5000 Packet Transport Router.

**Options none**—Display information about hardware. For a TX Matrix router, display information about the TX Matrix router and its attached T640 routers. For a TX Matrix Plus router, display information about the TX Matrix Plus router and its attached routers.

**clei-models**—(Optional) Display Common Language Equipment Identifier (CLEI) barcode and model number for orderable field-replaceable units (FRUs).

**detail**—(Optional) Include RAM and disk information in output.

**extensive**—(Optional) Display ID EEPROM information.

**all-members**—(MX Series routers only) (Optional) Display hardware-specific information for all the members of the Virtual Chassis configuration.

**interconnect-device *name***—(QFabric systems only) (Optional) Display hardware-specific information for the Interconnect device.

**lcc *number***—(TX Matrix routers and TX Matrix Plus router only) (Optional) On a TX Matrix router, display hardware information for a specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display hardware information for a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers only) (Optional) Display hardware-specific information for the local Virtual Chassis members.

**member *member-id***—(MX Series routers and EX Series switches) (Optional) Display hardware-specific information for the specified member of the Virtual Chassis configuration. Replace *member-id* variable with a value 0 or 1.

**models**—(Optional) Display model numbers and part numbers for orderable FRUs and, for components that use ID EEPROM format v2, the CLEI code.

**node-device *name***—(QFabric systems only) (Optional) Display hardware-specific information for the Node device.

**satellite [*slot-id slot-id* | device-alias *alias-name*]**—(Junos Fusion only) (Optional) Display hardware information for the specified satellite device in a Junos Fusion, or for all satellite devices in the Junos Fusion if no satellite devices are specified.

**scc**—(TX Matrix router only) (Optional) Display hardware information for the TX Matrix router (switch-card chassis).

**sfc *number***—(TX Matrix Plus router only) (Optional) Display hardware information for the TX Matrix Plus router (switch-fabric chassis). Replace *number* variable with 0.

**Additional Information** The **show chassis hardware detail** command now displays DIMM information for the following Routing Engines, as shown in [Table 142 on page 1730](#).

**Table 142: Routing Engines Displaying DIMM Information**

Routing Engines	Routers
RE-S-1800x2 and RE-S-1800x4	MX240, MX480, and MX960 routers
RE-A-1800x2	M120 and M320 routers

In Junos OS Release 11.4 and later, the output for the **show chassis hardware models** operational mode command for MX Series routers display the enhanced midplanes FRU model numbers—CHAS-BP3-MX240-S, CHAS-BP3-MX480-S, or CHAS-BP3-MX960-S—based on the router. In releases before Junos OS Release 11.4, the FRU model numbers are left blank when the router has enhanced midplanes. Note that the enhanced midplanes are introduced through Junos OS Release 13.3, but can be supported on all Junos OS releases.

Starting with Junos OS Release 17.3R1, the output of the **show chassis hardware** command displays the mode in which vMX is running (performance mode or lite mode) in the part number field for the FPC. **RIOT-PERF** indicates performance mode and **RIOT-LITE** indicates lite mode.

**Required Privilege Level** view

**Related Documentation**

- [show chassis power on page 2047](#)

**List of Sample Output**

- [show chassis hardware \(EX8216 Switch\) on page 1738](#)
- [show chassis hardware clei-models \(EX8216 Switch\) on page 1740](#)
- [show chassis hardware clei-models \(T1600 Router\) on page 1740](#)
- [show chassis hardware clei-models \(PTX10008 Routers\) on page 1741](#)

[show chassis hardware clei-models \(PTX10016 Routers\) on page 1741](#)  
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[show chassis hardware \(EX2300 Switch\) on page 1743](#)  
[show chassis hardware detail \(EX4200 Switch\) on page 1743](#)  
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[show chassis hardware models \(EX4500 Switch\) on page 1744](#)  
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[show chassis hardware clei-models \(MX104 Router\) on page 1795](#)  
[show chassis hardware \(MX240 Router\) on page 1795](#)  
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[show chassis hardware clei-models \(MX960 Router with MPC5EQ\) on page 1824](#)  
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[show chassis hardware models \(MX2020 Routers with MPC5EQ and MPC6E\) on page 1902](#)

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[show chassis hardware \(MX240, MX480, MX960 routers with Application Services Modular Line Card\) on page 1904](#)

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[show chassis hardware detail \(PTX5000 Packet Transport Router\) on page 1978](#)

[show chassis hardware detail \(PTX5000 Packet Transport Router with AC PSM and PDU\) on page 1980](#)

[show chassis hardware detail \(PTX5000 Packet Transport Router with FPC2-PTX-P1A\) on page 1980](#)

[show chassis hardware models \(PTX5000 Packet Transport Router\) on page 1981](#)

[show chassis hardware models \(PTX5000 Packet Transport Router with AC PSM and PDU\) on page 1981](#)

[show chassis hardware models \(PTX5000 Packet Transport Router with FPC2-PTX-P1A\) on page 1982](#)

[show chassis hardware extensive \(PTX5000 Packet Transport Router\) on page 1982](#)

[show chassis hardware extensive \(PTX1000 Packet Transport Router\) on page 1983](#)

[show chassis hardware extensive \(PTX5000 with Control Board 2\) on page 1984](#)

[show chassis hardware \(MX Routers with Media Services Blade \[MSB\]\) on page 1984](#)

[show chassis hardware extensive \(MX Routers with Media Services Blade \[MSB\]\) on page 1984](#)

[show chassis hardware \(ACX5048 Router\) on page 1985](#)

[show chassis hardware detail \(ACX5048 Router\) on page 1986](#)

[show chassis hardware clei-models \(ACX5048 Router\) on page 1987](#)

[show chassis hardware models \(ACX5048 Router\) on page 1987](#)

[show chassis hardware \(ACX5096 Router\) on page 1987](#)

[show chassis hardware detail \(ACX5096 Router\) on page 1988](#)

[show chassis hardware clei-models \(ACX5096 Router\) on page 1988](#)

[show chassis hardware models \(ACX5096 Router\) on page 1989](#)

[show chassis hardware \(ACX500 Router\) on page 1989](#)



[show chassis hardware detail \(ACX500 Router\) on page 1989](#)  
[show chassis hardware extensive \(ACX500 Router\) on page 1990](#)  
[show chassis hardware clei-models \(ACX500 Router\) on page 1991](#)  
[show chassis hardware models \(ACX500 Router\) on page 1992](#)

**Output Fields** [Table 143 on page 1736](#) lists the output fields for the **show chassis hardware** command. Output fields are listed in the approximate order in which they appear.

Table 143: show chassis hardware Output Fields

Field Name	Field Description	Level of Output
<b>Item</b>	<p>Chassis component:</p> <ul style="list-style-type: none"> <li>(EX Series switches)—Information about the chassis, Routing Engine (SRE and Routing Engine modules in EX8200 switches), power supplies, fan trays, and LCD panel. Also displays information about Flexible PIC Concentrators (FPCs) and associated Physical Interface Cards (PICs). Information about the backplane, midplane, and SIBs (SF modules) is displayed for EX8200 switches.</li> <li>(MX Series routers and EX Series switches)—Information about the backplane, Routing Engine, Power Entry Modules (PEMs), and fan trays. Also displays information about Flexible PIC Concentrators (FPCs) and associated Physical Interface Cards (PICs), Modular Port Concentrators (MPCs) and associated Modular Interface Cards (MICs), or Dense Port Concentrators (DPCs). MX80 routers have a single Routing Engine and a built-in Packet Forwarding Engine that attaches directly to MICs. The Packet Forwarding Engine has two “pseudo” FPCs (FPC 0 and FPC1). MX80 routers also have a Forwarding Engine Board (FEB). MX104 routers have a built-in Packet forwarding Engine and a Forwarding Engine Board (FEB). The Packet Forwarding Engine of the MX104 router has three “pseudo” FPCs (FPC0, FPC1, and FPC2).</li> <li>(M Series routers, except for the M320 router)—Information about the backplane; power supplies; fan trays; Routing Engine; maxicab (the connection between the Routing Engine and the backplane, for the M40 router only); SCB, SSB, SFM, or FEB; MCS and PCG (for the M160 router only); each FPC and PIC; and each fan, blower, and impeller.</li> <li>(M120, M320, and T Series routers)—Information about the backplane, power supplies, fan trays, midplane, FPM (craft interface), CIP, PEM, SCG, CB, FPC, PIC, SFP, SPMB, and SIB.</li> <li>(QFX Series)—Information about the chassis, Pseudo CB, Routing Engine, power supplies, fan trays, Interconnect devices, and Node devices. Also displays information about Flexible PIC Concentrators (FPCs) and associated Physical Interface Cards (PICs).</li> <li>(PTX Series)—Information about the chassis, midplane, craft interface (FPM), power distribution units (PDUs) and Power Supply Modules (PSMs), Centralized Clock Generators (CCGs), Routing Engines, Control Boards (CBs) and Switch Processor Mezzanine Boards (SPMBs), Flexible PIC Concentrators (FPCs), PICs, Switch Interface Boards (SIBs), and fan trays (vertical and horizontal).</li> <li>(MX2010, MX2020, and MX2008 routers)—Information about the chassis, midplane, craft interface (FPM), power midplane (PMP), Power Supply Modules (PSMs), Power Distribution Modules (PDMs), Routing Engines, Control Boards (CBs) and Switch Processor Mezzanine Boards (SPMBs), Switch Fabric Boards (SFBs), Flexible PIC Concentrators (FPCs), PICs, adapter cards (ADCs) and fan trays.</li> <li>(vMX routers)—Information about the chassis, midplane, Routing Engines, and Control Boards (CBs). Also displays information about Flexible PIC Concentrators (FPCs) and associated Modular Interface Cards (MICs) and Physical Interface Cards (PICs).</li> </ul>	All levels
<b>Version</b>	Revision level of the chassis component.	All levels
<b>Part number</b>	Part number of the chassis component.	All levels

Table 143: show chassis hardware Output Fields (continued)

Field Name	Field Description	Level of Output
<b>Serial number</b>	Serial number of the chassis component. The serial number of the backplane is also the serial number of the router chassis. Use this serial number when you need to contact Juniper Networks Customer Support about the router or switch chassis.	All levels
<b>Assb ID or Assembly ID</b>	( <b>extensive</b> keyword only) Identification number that describes the FRU hardware.	<b>extensive</b>
<b>Assembly Version</b>	( <b>extensive</b> keyword only) Version number of the FRU hardware.	<b>extensive</b>
<b>Assembly Flags</b>	( <b>extensive</b> keyword only) Flags.	<b>extensive</b>
<b>FRU model number</b>	( <b>clei-models</b> , <b>extensive</b> , and <b>models</b> keyword only) Model number of the FRU hardware component.	none specified
<b>CLEI code</b>	( <b>clei-models</b> and <b>extensive</b> keyword only) Common Language Equipment Identifier code. This value is displayed only for hardware components that use ID EEPROM format v2. This value is not displayed for components that use ID EEPROM format v1.	none specified
<b>EEPROM Version</b>	ID EEPROM version used by the hardware component: <b>0x00</b> (version 0), <b>0x01</b> (version 1), or <b>0x02</b> (version 2).	<b>extensive</b>
<b>Description</b>	<p>Brief description of the hardware item:</p> <ul style="list-style-type: none"> <li>• Type of power supply.</li> <li>• Type of PIC. If the PIC type is not supported on the current software release, the output states <b>Hardware Not Supported</b>.</li> <li>• Type of FPC: <b>FPC Type 1</b>, <b>FPC Type 2</b>, <b>FPC Type 3</b>, <b>FPC Type 4</b>, or <b>FPC TypeOC192</b>.</li> </ul> <p>On EX Series switches, a brief description of the FPC.</p> <p>The following list shows the PIM abbreviation in the output and the corresponding PIM name.</p> <ul style="list-style-type: none"> <li>• <b>2x FE</b>—Either two built-in Fast Ethernet interfaces (fixed PIM) or dual-port Fast Ethernet PIM</li> <li>• <b>4x FE</b>—4-port Fast Ethernet ePIM</li> <li>• <b>1x GE Copper</b>—Copper Gigabit Ethernet ePIM (one 10-Mbps, 100-Mbps, or 1000-Mbps port)</li> <li>• <b>1x GE SFP</b>—SFP Gigabit Ethernet ePIM (one fiber port)</li> <li>• <b>2x Serial</b>—Dual-port serial PIM</li> <li>• <b>2x T1</b>—Dual-port T1 PIM</li> <li>• <b>2x E1</b>—Dual-port E1 PIM</li> <li>• <b>2x CT1E1</b>—Dual-port channelized T1/E1 PIM</li> <li>• <b>1x T3</b>—T3 PIM (one port)</li> <li>• <b>1x E3</b>—E3 PIM (one port)</li> <li>• <b>4x BRI S/T</b>—4-port ISDN BRI S/T PIM</li> <li>• <b>4x BRI U</b>—4-port ISDN BRI U PIM</li> <li>• <b>1x ADSL Annex A</b>—ADSL 2/2+ Annex A PIM (one port, for POTS)</li> </ul>	All levels

Table 143: show chassis hardware Output Fields (continued)

Field Name	Field Description	Level of Output
	<ul style="list-style-type: none"> <li>• <b>1x ADSL Annex B</b>—ADSL 2/2+ Annex B PIM (one port, for ISDN)</li> <li>• <b>2x SHDSL (ATM)</b>—G SHDSL PIM (2-port two-wire module or 1-port four-wire module)</li> <li>• <b>1x TGM550</b>—TGM550 Telephony Gateway Module (Avaya VoIP gateway module with one console port, two analog <b>LINE</b> ports, and two analog <b>TRUNK</b> ports)</li> <li>• <b>1x DS1 TIM510</b>—TIM510 E1/T1 Telephony Interface Module (Avaya VoIP media module with one E1 or T1 trunk termination port and ISDN PRI backup)</li> <li>• <b>4x FXS, 4x FXO, TIM514</b>—TIM514 Analog Telephony Interface Module (Avaya VoIP media module with four analog <b>LINE</b> ports and four analog <b>TRUNK</b> ports)</li> <li>• <b>4x BRI TIM521</b>—TIM521 BRI Telephony Interface Module (Avaya VoIP media module with four ISDN BRI ports)</li> <li>• <b>Crypto Accelerator Module</b>—For enhanced performance of cryptographic algorithms used in IP Security (IPsec) services</li> <li>• <b>MPC M16x10GE</b>—16-port 10-Gigabit Module Port Concentrator that supports SFP+ optical transceivers. (Not on EX Series switches.)</li> <li>• For hosts, the Routing Engine type.</li> <li>• For small form-factor pluggable transceiver (SFP) modules, the type of fiber: <b>LX, SX, LH, or T</b>.</li> <li>• LCD description for EX Series switches (except EX2200 switches).</li> <li>• <b>MPC2</b>—1-port MPC2 that supports two separate slots for MICs.</li> <li>• <b>MPC3E</b>—1-port MPC3E that supports two separate slots for MICs (MIC-3D-1X100GE-CFP and MIC-3D-20GE-SFP) on MX960, MX480, and MX240 routers. The MPC3E maps one MIC to one PIC (1 MIC, 1 PIC), which differs from the mapping of legacy MPCs.</li> <li>• 100GBASE-LR4, pluggable CFP optics</li> <li>• Supports the Enhanced MX Switch Control Board with fabric redundancy and existing SCBs without fabric redundancy.</li> <li>• Interoperates with existing MX Series line cards, including Flexible Port Concentrators (FPC), Dense Port Concentrators (DPCs), and Modular Port Concentrators (MPCs).</li> <li>• <b>MPC4E</b>—Fixed configuration MPC4E that is available in two flavors: MPC4E-3D-32XGE-SFPP and MPC4E-3D-2CGE-8XGE on MX2020, MX960, MX480, and MX240 routers.</li> <li>• LCD description for MX Series routers</li> </ul>	

## Sample Output

### show chassis hardware (EX8216 Switch)

```
user@host> show chassis hardware
```

```
Hardware inventory:
```

Item	Version	Part number	Serial number	Description
Chassis	REV 06		CY0109220035	EX8216
Midplane	REV 06	710-016845	BA0909120112	EX8216-MP
CB 0	REV 22	710-020771	AX0109197723	EX8216-RE320
CB 1	REV 22	710-020771	AX0109197726	EX8216-RE320

Routing Engine 1		BUILTIN	BUILTIN	RE-EX8216
FPC 3	REV 19	710-020683	BC0109083125	EX8200-48F
CPU	REV 13	710-020598	BF0109144549	EX8200-CPU
FPC 4	REV 17	710-020683	BC0108500127	EX8200-48F
CPU	REV 10	710-020598	BF0108460510	EX8200-CPU
PIC 0		BUILTIN	BUILTIN	48x 100 Base-QFX/1000
Base-X				
Xcvr 1	REV 01	740-011613	PE70V89	SFP-SX
Xcvr 11	REV 01	740-011613	PE70YCE	SFP-SX
Xcvr 12	REV 01	740-011613	PE70VSH	SFP-SX
Xcvr 13	REV 01	740-011613	E08C02063	SFP-SX
Xcvr 14	REV 01	740-011613	PE70VKU	SFP-SX
Xcvr 15	REV 01	740-011613	E08E03372	SFP-SX
Xcvr 21	REV 01	740-011613	PE70VAD	SFP-SX
Xcvr 22	REV 01	740-011613	E08E01228	SFP-SX
Xcvr 23	REV 01	740-011613	PE70VSL	SFP-SX
Xcvr 24	REV 01	740-011613	E08E03409	SFP-SX
Xcvr 25	REV 01	740-011613	PE70VL4	SFP-SX
Xcvr 26	REV 01	740-011613	PDQ4L2Z	SFP-SX
Xcvr 27	REV 01	740-011613	PE70WFK	SFP-SX
Xcvr 28	REV 01	740-011782	PBD2B5U	SFP-SX
Xcvr 29	REV 01	740-011613	PE70UQX	SFP-SX
Xcvr 30	REV 01	740-011613	PE70VL5	SFP-SX
Xcvr 31	REV 01	740-011613	PE70V0F	SFP-SX
Xcvr 32	REV 01	740-011613	E08C02052	SFP-SX
Xcvr 33	REV 01	740-011613	E08C02197	SFP-SX
Xcvr 34	REV 01	740-011613	PE70V0L	SFP-SX
Xcvr 35	REV 01	740-011613	E08E03390	SFP-SX
Xcvr 36	REV 01	740-011613	PDQ4VL9	SFP-SX
Xcvr 37	REV 01	740-011613	E08E03370	SFP-SX
Xcvr 38	REV 01	740-011613	E08E03362	SFP-SX
Xcvr 39	REV 01	740-011613	E08C02065	SFP-SX
Xcvr 40	REV 01	740-011613	E08E03405	SFP-SX
Xcvr 41	REV 01	740-011613	E08E03411	SFP-SX
Xcvr 43	REV 01	740-011613	E08C02171	SFP-SX
Xcvr 45	REV 01	740-011613	E08E03410	SFP-SX
FPC 13	REV 16	710-016837	BB0109051344	EX8200-8XS
CPU				
SIB 0	REV 10	710-021613	AY0109166244	EX8216-SF320
SIB 1	REV 10	710-021613	AY0109166357	EX8216-SF320
SIB 2	REV 10	710-021613	AY0109166362	EX8216-SF320
SIB 3	REV 10	710-021613	AY0109166338	EX8216-SF320
SIB 4	REV 10	710-021613	AY0109166350	EX8216-SF320
SIB 5	REV 10	710-021613	AY0109166365	EX8216-SF320
SIB 6	REV 10	710-021613	AY0109166361	EX8216-SF320
SIB 7	REV 10	710-021613	AY0109166399	EX8216-SF320
PSU 0	REV 17	740-021466	BG0709170003	EX8200-AC2K
PSU 1	REV 17	740-021466	BG0709170004	EX8200-AC2K
PSU 2	REV 17	740-021466	BG0709170020	EX8200-AC2K
PSU 3	REV 17	740-021466	BG0709170017	EX8200-AC2K
PSU 4	REV 17	740-021466	BG0709170008	EX8200-AC2K
PSU 5	REV 17	740-021466	BG0709170018	EX8200-AC2K
Top Fan Tray				
FTC 0	REV 4	760-022620	CX1209140212	EX8216-FT
FTC 1	REV 4	760-022620	CX1209140212	EX8216-FT
Bottom Fan Tray				
FTC 0	REV 4	760-022620	CX1209140211	EX8216-FT
FTC 1	REV 4	760-022620	CX1209140211	EX8216-FT
LCD 0	REV 04	710-025742	CE0109186919	EX8200 LCD

**show chassis hardware clei-models (EX8216 Switch)**

```
user@host> show chassis hardware clei-models
```

```
Hardware inventory:
```

Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 08	710-016845		
PSU 0	REV 05	740-023002	COUPAEAEAA	EX8200-PWR-AC3KR
PSU 1	REV 05	740-023002	COUPAEAEAA	EX8200-PWR-AC3KR
PSU 2	REV 05	740-023002	COUPAEAEAA	EX8200-PWR-AC3KR
PSU 3	REV 05	740-023002	COUPAEAEAA	EX8200-PWR-AC3KR
PSU 4	REV 05	740-023002	COUPAEAEAA	EX8200-PWR-AC3KR
PSU 5	REV 05	740-023002	COUPAEAEAA	EX8200-PWR-AC3KR
Top Fan Tray				
Bottom Fan Tray				

**show chassis hardware clei-models (T1600 Router)**

```
user@host> show chassis hardware clei-models
```

```
Hardware inventory:
```

Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 03	710-005608		CHAS-BP-T640-S
FPM Display	REV 05	710-002897		CRAFT-T640-S
CIP	REV 06	710-002895		CIP-L-T640-S
PEM 0	Rev 07	740-017906	IPUPAC7KTA	PWR-T1600-3-80-DC-S
PEM 1	Rev 18	740-002595		PWR-T-DC-S
SCG 0	REV 15	710-003423		SCG-T-S
Routing Engine 0	REV 08	740-014082		RE-A-2000-4096-S
Routing Engine 1	REV 07	740-014082		RE-A-2000-4096-S
CB 0	REV 05	710-007655		CB-T-S
CB 1	REV 03	710-017707		CB-T-S
FPC 0	REV 07	710-013558		T640-FPC2-E2
PIC 0	REV 01	750-010618		PB-4GE-SFP
PIC 1	REV 06	750-001900		PB-10C48-SON-SMSR
PIC 2	REV 14	750-001901		PB-40C12-SON-SMIR
PIC 3	REV 07	750-001900		PB-10C48-SON-SMSR
FPC 1	REV 06	710-013553		T640-FPC1-E2
PIC 0	REV 08	750-001072		P-1GE-SX
PIC 1	REV 10	750-012266		PB-4GE-TYPE1-SFP-IQ2
PIC 2	REV 22	750-005634		PB-1CH0C12SMIR-QPP
FPC 2				
PIC 0	REV 16	750-007141		PC-10GE-SFP
PIC 1	REV 06	750-015217		PC-8GE-TYPE3-SFP-IQ2
PIC 2	REV 05	750-004695		PC-TUNNEL
PIC 3	REV 17	750-009553		PC-40C48-SON-SFP
FPC 3	REV 01	710-010154		T640-FPC3-E
PIC 0	REV 07	750-012793		PC-1XGE-TYPE3-XFP-IQ2
PIC 1	REV 25	750-007141		PC-10GE-SFP
PIC 2	REV 17	750-009553		PC-40C48-SON-SFP
PIC 3	REV 32	750-003700		PC-10C192-SON-VSR
FPC 4	REV 16	710-013037		T1600-FPC4-ES
PIC 1	REV 06	750-034781		PD-1CE-CFP
FPC 5	REV 02	710-013037		T1600-FPC4-ES
PIC 0	REV 16	750-012518		PD-40C192-SON-XFP
PIC 1	REV 01	750-010850		PD-10C768-SON-SR
FPC 6	REV 14	710-013037		T1600-FPC4-ES
PIC 0	REV 11	750-017405		PD-4XGE-XFP
PIC 1	REV 13	750-017405		PD-4XGE-XFP
FPC 7	REV 09	710-007529		T640-FPC3

PIC 0	REV 10	750-012793	PC-1XGE-TYPE3-XFP-IQ2
PIC 1	REV 01	750-015217	PC-8GE-TYPE3-SFP-IQ2
PIC 2	REV 01	750-015217	PC-8GE-TYPE3-SFP-IQ2
PIC 3	REV 15	750-009450	PC-10C192-S0N-SR2
SIB 0	REV 07	710-013074	SIB-I-T1600-S
SIB 1	REV 07	710-013074	SIB-I-T1600-S
SIB 2	REV 07	710-013074	SIB-I-T1600-S
SIB 3	REV 07	710-013074	SIB-I-T1600-S
SIB 4	REV 07	710-013074	SIB-I-T1600-S
Fan Tray 0			FANTRAY-T-S
Fan Tray 1			FANTRAY-T-S
Fan Tray 2			FAN-REAR-TX-T640-S

### show chassis hardware clei-models (PTX10008 Routers)

```
user@host> show chassis hardware clei-models
```

Hardware inventory:

Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 27	750-054097	CMMUM00ARA	QFX10008-CHAS
CB 0	REV 02	750-068820	CMUCAH3CTB	QFX10000-RE
CB 1	REV 02	750-068820	CMUCAH3CTB	QFX10000-RE
FPC 0	REV 36	750-051354	CMUIAM9BAA	QFX10000-36Q
PIC 0		BUILTIN		
FPC 1	REV 33	750-051354	CMUIAM9BAA	QFX10000-36Q
PIC 0		BUILTIN		
FPC 2	REV 32	750-051357	CMUIANABAA	QFX10000-30C
PIC 0		BUILTIN		
FPC 3	REV 35	750-051357	CMUIANABAA	QFX10000-30C
PIC 0		BUILTIN		
FPC 5	REV 08	750-068822	CMUIAM9BAB	QFX10000-36Q
PIC 0		BUILTIN		
FPC 6	REV 08	750-068822	CMUIAM9BAB	QFX10000-36Q
PIC 0		BUILTIN		
FPD Board	REV 07	711-054687		
Power Supply 0	REV 02	740-049388	CMUPADNBAA	QFX10000-PWR-AC
Power Supply 1	REV 02	740-049388	CMUPADNBAA	QFX10000-PWR-AC
Power Supply 2	REV 02	740-049388	CMUPADNBAA	QFX10000-PWR-AC
Power Supply 3	REV 02	740-049388	CMUPADNBAA	QFX10000-PWR-AC
Power Supply 4	REV 02	740-049388	CMUPADNBAA	QFX10000-PWR-AC
Power Supply 5	REV 02	740-049388	CMUPADNBAA	QFX10000-PWR-AC
FTC 0	REV 14	750-050108	CMUCAHZCAA	QFX10008-FAN-CTRL
FTC 1	REV 14	750-050108	CMUCAHZCAA	QFX10008-FAN-CTRL
Fan Tray 0	REV 09	760-054372	CMUCAHYCAA	QFX10008-FAN
Fan Tray 1	REV 09	760-054372	CMUCAHYCAA	QFX10008-FAN
SIB 0	REV 24	750-050058	CMUCAH0CAA	QFX10008-SF
SIB 1	REV 24	750-050058	CMUCAH0CAA	QFX10008-SF
SIB 2	REV 24	750-050058	CMUCAH0CAA	QFX10008-SF
SIB 3	REV 24	750-050058	CMUCAH0CAA	QFX10008-SF
SIB 4	REV 24	750-050058	CMUCAH0CAA	QFX10008-SF
SIB 5	REV 23	750-050058	CMUCAH0CAA	QFX10008-SF

### show chassis hardware clei-models (PTX10016 Routers)

```
user@host> show chassis hardware clei-models
```

Hardware inventory:

Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 24	750-077138	CMMUN00ARA	JNP10016

CB 0	REV 04	711-065897	PROTOXCLEI	PROTO-ASSEMBLY
CB 1	REV 05	711-065897	PROTOXCLEI	PROTO-ASSEMBLY
FPC 2				
PIC 0		BUILTIN		
FPC 4	REV 35	750-071976	CMUIANABAA	JNP10K-LC1101
PIC 0		BUILTIN		
FPC 5	REV 13	750-068822	CMUIAM9BAC	QFX10000-36Q
PIC 0		BUILTIN		
FPC 6	REV 41	750-071976	CMUIANABAB	JNP10K-LC1101
PIC 0		BUILTIN		
FPC 7	REV 35	750-071976	CMUIANABAA	JNP10K-LC1101
PIC 0		BUILTIN		
FPC 8	REV 35	750-071976	CMUIANABAA	JNP10K-LC1101
PIC 0		BUILTIN		
FPC 9	REV 41	750-071976	CMUIANABAB	JNP10K-LC1101
PIC 0		BUILTIN		
FPC 10	REV 35	750-071976	CMUIANABAA	JNP10K-LC1101
PIC 0		BUILTIN		
FPC 11	REV 35	750-071976	CMUIANABAA	JNP10K-LC1101
PIC 0		BUILTIN		
FPC 13	REV 41	750-071976	CMUIANABAB	JNP10K-LC1101
PIC 0		BUILTIN		
FPC 15	REV 37	750-071976	CMUIANABAA	JNP10K-LC1101
PIC 0		BUILTIN		
Power Supply 0	REV 01	740-073147	CMUPADPBAA	JNP10K-PWR-DC
Power Supply 1	REV 01	740-073147	CMUPADPBAA	JNP10K-PWR-DC
Power Supply 2	REV 01	740-073147	CMUPADPBAA	JNP10K-PWR-DC
Power Supply 3	REV 01	740-073147	CMUPADPBAA	JNP10K-PWR-DC
Power Supply 4	REV 01	740-073147	CMUPADPBAA	JNP10K-PWR-DC
Power Supply 5	REV 01	740-073147	CMUPADPBAA	JNP10K-PWR-DC
Power Supply 6	REV 01	740-073147	CMUPADPBAA	JNP10K-PWR-DC
Power Supply 7	REV 01	740-073147	CMUPADPBAA	JNP10K-PWR-DC
Power Supply 8	REV 01	740-073147	CMUPADPBAA	JNP10K-PWR-DC
Power Supply 9	REV 01	740-073147	CMUPADPBAA	JNP10K-PWR-DC
Fan Tray 0				QFX5100-FAN-AFO
Fan Tray 1				QFX5100-FAN-AFO
SIB 0	REV 15	750-077140	CMUCAH6CAA	JNP10016-SF
SIB 1	REV 15	750-077140	CMUCAH6CAA	JNP10016-SF
SIB 2	REV 15	750-077140	CMUCAH6CAA	JNP10016-SF
SIB 3	REV 15	750-077140	CMUCAH6CAA	JNP10016-SF
SIB 4	REV 15	750-077140	CMUCAH6CAA	JNP10016-SF
SIB 5	REV 15	750-077140	CMUCAH6CAA	JNP10016-SF
FPD Board	REV 07	711-054687		

### show chassis hardware (EX2300-C Switch)

```
user@switch> show chassis hardware
```

Hardware inventory:				
Item	Version	Part number	Serial number	Description
Chassis			HV0215410003	EX2300-C-12P
Pseudo CB 0				
Routing Engine 0		BUILTIN	BUILTIN	RE-EX2300C-12P
FPC 0	REV 04	650-059984	HV0215410003	EX2300-C-12P
CPU		BUILTIN	BUILTIN	FPC CPU
PIC 0	REV 04	BUILTIN	BUILTIN	12x10/100/1000 Base-T
PIC 1	REV 04	650-059984	HV0215410003	2x10G SFP/SFP+
Xcvr 0	REV 01	740-021309	T09K00695	SFP+-10G-LR
Xcvr 1	REV 01	740-030658	AD1146A05JT	SFP+-10G-USR
Power Supply 0				JPSU-170W-AC



## show chassis hardware (EX2300 Switch)

```
user@switch> show chassis hardware
```

```
Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis                               JY0215410033  EX2300-24P
Pseudo CB 0
Routing Engine 0
FPC 0         REV 05   650-059968   JY0215410033   EX2300-24P
  CPU                               BUILTIN        BUILTIN        FPC CPU
  PIC 0        REV 05   BUILTIN      BUILTIN        24x10/100/1000 Base-T
  PIC 1        REV 05   650-059968   JY0215410033   4x10G SFP/SFP+
    Xcvr 0     REV 01   740-030658   AD1125A03ES    SFP+-10G-USR
    Xcvr 1     REV 01   740-021308   AJPOTDZ        SFP+-10G-SR
    Xcvr 3     REV 01   740-021309   A9401FL        SFP+-10G-LR
Power Supply 0
Fan Tray 0    (AF0)
Fan Tray 1    (AF0)

Fan Module, Airflow Out
Fan Module, Airflow Out
```

## show chassis hardware detail (EX4200 Switch)

```
user@host> show chassis hardware detail
```

```
Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis                               BM0208327733   EX4200-24T
Routing Engine 0 REV 11   750-021256   BM0208327733   EX4200-24T, 8 POE
Routing Engine 0
FPC 0         REV 11   750-021256   BM0208327733   EX4200-24T, 8 POE
  CPU                               BUILTIN        BUILTIN        FPC CPU
  PIC 0        REV 11   BUILTIN      BUILTIN        24x 10/100/1000 Base-T
  PIC 1        REV 03B  711-021270   AR0208162285   4x GE SFP
  BRD          REV 08   711-021264   AK0208328289   EX4200-24T, 8 POE
Power Supply 0 REV 03   740-020957   AT0508346354   PS 320W AC
Fan Tray
```

## show chassis hardware (EX4300 Switch)

```
user@host> show chassis hardware
```

```
Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis                               PD3713160055   EX4300-48P
Routing Engine 0 REV 04   650-044930   PD3713160055   EX4300-48P
FPC 0         REV 04   650-044930   PD3713160055   EX4300-48P
  CPU                               BUILTIN        BUILTIN        FPC CPU
  PIC 0        REV 04   BUILTIN      BUILTIN        48x 10/100/1000 Base-T
  PIC 1        REV 04   BUILTIN      BUILTIN        4x 40GE
Power Supply 0 REV 01   740-046871   1EDA3090026    JPSU-1100-AC-AF0-A
Fan Tray 0    (AF0)
Fan Tray 1    (AF0)

Fan Module, Airflow Out
Fan Module, Airflow Out
```

## show chassis hardware models (EX4500 Switch)

```
user@host> show chassis hardware models
```

```
Hardware inventory:
```

Item	Version	Part number	Serial number	FRU model number
Routing Engine 0	REV 01	750-035700	GG0210271867	EX4500-40F-FB-C
FPC 0	REV 01	750-035700	GG0210271867	EX4500-40F-FB-C
PIC 0		BUILTIN	BUILTIN	EX4500-40F-FB-C
Power Supply 1	REV 01	740-029654	H884FS00JC09	EX4500-PWR1-AC-FB

## show chassis hardware detail (EX9200 Switch)

```
user@switch> show chassis hardware
```

```
Hardware inventory:
```

Item	Version	Part number	Serial number	Description
Chassis			JN111DA44RFB	EX9208
Midplane	REV 05	710-017414	TS2912	EX9208-BP
FPM Board	REV 02	710-017254	XN1804	Front Panel Display
PEM 0	Rev 01	740-022697	QCS0906C033	PS 1.2-1.7kW; 100-240V
AC in				
PEM 1	Rev 01	740-022697	QCS0906C095	PS 1.2-1.7kW; 100-240V
AC in				
Routing Engine 0	REV 08	740-031116	9009122883	RE-S-EX9200-1800X4
CB 0	REV 16	750-031391	CAAW4391	EX9200-SCBEF
PC 0	REV 07	750-049612	CABJ9312	EX9200 40x1G Copper
CPU	REV 04	711-038484	CABH8268	MPCE PMB 2G
MIC 0	REV 02	750-049607	CABT9623	40x 1GE RJ45
PIC 0		BUILTIN	BUILTIN	10x 1GE RJ45
PIC 1		BUILTIN	BUILTIN	10x 1GE RJ45
PIC 2		BUILTIN	BUILTIN	10x 1GE RJ45
PIC 3		BUILTIN	BUILTIN	10x 1GE RJ45
FPC 1	REV 10	710-013699	CAAN3529	EX9200-40x1G-SFP
CPU	REV 04	711-038484	CAAL7608	MPCE PMB 2G
MIC 0	REV 26	750-028392	CAAS5151	20x 1GE SFP
PIC 0		BUILTIN	BUILTIN	10x 1GE SFP
PIC 1		BUILTIN	BUILTIN	10x 1GE SFP
MIC 1	REV 26	750-028392	CAAC8006	20x 1GE SFP
PIC 2		BUILTIN	BUILTIN	10x 1GE SFP
Xcvr 8	REV 01	740-011613	E08L03674	SFP-SX
Xcvr 9	REV 01	740-011613	E08M00243	SFP-SX
PIC 3		BUILTIN	BUILTIN	10x 1GE SFP
FPC 3	REV 10	710-013699	CAAR5261	EX9200-40x1G-SFP
CPU	REV 04	711-038484	CAAS2118	MPCE PMB 2G
MIC 0	REV 26	750-028392	CAAS5067	20x 1GE SFP
PIC 0		BUILTIN	BUILTIN	10x 1GE SFP
Xcvr 2	REV 01	740-031851	PNA7L8U	SFP-SX
Xcvr 3	REV 02	740-011613	AM0943SEKGZ	SFP-SX
Xcvr 4	REV 02	740-011613	AM0943SEJZ9	SFP-SX
PIC 1		BUILTIN	BUILTIN	10x 1GE SFP
MIC 1	REV 26	750-028392	CAAS5132	20x 1GE SFP
PIC 2		BUILTIN	BUILTIN	10x 1GE SFP
Xcvr 4	REV 01	740-011613	E08D02625	SFP-SX
Xcvr 9	REV 02	740-011613	PJH4RD9	SFP-SX
PIC 3		BUILTIN	BUILTIN	10x 1GE SFP
Xcvr 0	REV 01	740-011613	AM0813S8YME	SFP-SX
Fan Tray				Left Fan Tray

## show chassis hardware detail (EX9251 Switch)

```
user@switch> show chassis hardware
```

## Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			BLANK	EX9251
Routing Engine 0		BUILTIN	BUILTIN	RE-S-2X00x6
CB 0	REV 05	750-069579	CAGT1382	EX9251
FPC 0		BUILTIN	BUILTIN	MPC
PIC 0		BUILTIN	BUILTIN	4XQSFP28 PIC
Xcvr 0	REV 01	740-044512	APF14500007NHC	QSFP+-40G-CU50CM
Xcvr 2	REV 01	740-046565	QH21035H	QSFP+-40G-SR4
PIC 1		BUILTIN	BUILTIN	8XSFP PIC
Xcvr 0	REV 01	740-031980	AA15393URH7	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AA162832LVG	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	MXAONKJ	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	MXAOK75	SFP+-10G-SR
Xcvr 4	REV 01	740-021308	MXA138L	SFP+-10G-SR
Xcvr 5	REV 01	740-021308	13T511102684	SFP+-10G-SR
Xcvr 6	REV 01	740-021308	MXA138E	SFP+-10G-SR
Xcvr 7	REV 01	740-021308	MXA152N	SFP+-10G-SR
PEM 0	REV 02	740-070749	1F186390060	AC AFO 650W PSU
PEM 1	REV 02	740-070749	1F186390045	AC AFO 650W PSU
Fan Tray 0				Fan Tray, Front to Back
Airflow - AFO				
Fan Tray 1				Fan Tray, Front to Back
Airflow - AFO				

## show chassis hardware detail (EX9253 Switch)

```
user@switch> show chassis hardware
```

## Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN126145CJCB	EX9253
Midplane	REV 06	750-074276	CAJE4108	Midplane 2
Routing Engine 0		BUILTIN	BUILTIN	RE-S-2X00x6
Routing Engine 1		BUILTIN	BUILTIN	RE-S-2X00x6
CB 0	REV 24	750-067071	CAJF6414	Control Board
Mezz	REV 14	711-066896	CAJF6327	Control Mezz Board
CB 1	REV 24	750-067071	CAJF6398	Control Board
Mezz	REV 14	711-066896	CAJF6314	Control Mezz Board
FPC 0	REV 19	750-066879	CAJD1692	LC2103
CPU		BUILTIN	BUILTIN	SMPC PMB
PIC 0		BUILTIN	BUILTIN	6xQSFP
Xcvr 0	REV 01	740-054053	QH20019A	QSFP+-4X10G-SR
PIC 1	REV 15	750-068806	CAJD1416	MIC1
Xcvr 0	REV 01	740-061405	1ECQ1151163	QSFP-100GBASE-SR4
Xcvr 1	REV 01	740-061405	1ECQ11511AK	QSFP-100GBASE-SR4
Xcvr 2	REV 01	740-032986	QB160112	QSFP+-40G-SR4
FPC 1	REV 19	750-066879	CAJD1685	LC2103
CPU		BUILTIN	BUILTIN	SMPC PMB
PIC 0		BUILTIN	BUILTIN	6xQSFP
PIC 1	REV 15	750-068806	CAJD1393	MIC1
Xcvr 0	REV 01	740-032986	QB120887	QSFP+-40G-SR4
Xcvr 1	REV 01	740-032986	QD465034	QSFP+-40G-SR4
Xcvr 2	REV 01	740-052009	UWE2CBQ	QSFP+-40G-LR4
Xcvr 4	REV 01	740-032986	QB120701	QSFP+-40G-SR4
PEM 0	REV 01	740-066937	1HS17070027	JNP-PWR1600-AC

PEM 1	REV 01	740-066937	1HS17070151	JNP-PWR1600-AC
PEM 4	REV 01	740-066937	1HS17070090	JNP-PWR1600-AC
PEM 5	REV 01	740-066937	1HS16480119	JNP-PWR1600-AC
Fan Tray 0	REV 08	760-069329	CAJF6944	JNP FAN 3RU
Fan Tray 1	REV 08	760-069329	CAJF6863	JNP FAN 3RU
Fan Tray 2	REV 08	760-069329	CAJF6891	JNP FAN 3RU
Fan Tray 3	REV 08	760-069329	CAJF6937	JNP FAN 3RU

### show chassis hardware detail (PTX10008 Routers)

user@switch> show chassis hardware detail

Hardware inventory:				
Item	Version	Part number	Serial number	Description
Chassis			DE487	JNP10008 [PTX10008 -
PILOT BUILD V1.1]				
Midplane	REV 27	750-054097	ACPD4307	Midplane 8
Routing Engine 0		BUILTIN	BUILTIN	RE-PTX-2X00x4
vtbd0 15360 MB				Virtio Block Disk
vtbd1 15360 MB				Virtio Block Disk
ada0 128 MB	QEMU		QM00002	Virtio Block Disk
usb0 (addr 0.1)	EHCI root HUB 0		Intel	uhub0
usb1 (addr 0.2)	product 0x0020 32		vendor 0x8087	uhub1
Routing Engine 1		BUILTIN	BUILTIN	RE-PTX-2X00x4
vtbd0 15360 MB				Virtio Block Disk
vtbd1 15360 MB				Virtio Block Disk
ada0 128 MB	QEMU		QM00002	Virtio Block Disk
usb0 (addr 0.1)	EHCI root HUB 0		Intel	uhub0
usb1 (addr 0.2)	product 0x0020 32		vendor 0x8087	uhub1
CB 0	REV 02	750-068820	ACNZ4440	Control Board
CB 1	REV 02	750-068820	ACNZ8284	Control Board
FPC 0	REV 36	750-051354	ACNP4679	LC1102 - 12C / 36Q /
144X				
CPU		BUILTIN	BUILTIN	FPC CPU
PIC 0		BUILTIN	BUILTIN	12x100GE/36x40GE/144x10GE
Xcvr 1	REV 01	740-058734	1ECQ113834D	QSFP-100GBASE-SR4
Xcvr 5	REV 01	740-058734	1ECQ1137067	QSFP-100GBASE-SR4
Xcvr 6	REV 01	740-054053	QF3205SD	QSFP+-4X10G-SR
Xcvr 7	REV 01	740-058734	1ECQ11381MP	QSFP-100GBASE-SR4
Xcvr 11	REV 01	740-061405	1ACQ110507K	QSFP-100GBASE-SR4
Xcvr 13	REV 01	740-058734	1ECQ11390ZB	QSFP-100GBASE-SR4
Xcvr 17	REV 01	740-058734	1ECQ11381M1	QSFP-100GBASE-SR4
Xcvr 19	REV 01	740-058734	1ECQ11381JS	QSFP-100GBASE-SR4
Xcvr 23	REV 01	740-058734	1ACQ112000E	QSFP-100GBASE-SR4
Xcvr 25	REV 01	740-058734	1ECQ11381NT	QSFP-100GBASE-SR4
Xcvr 28	REV 01	740-054053	QG1502WV	QSFP+-4X10G-SR
Xcvr 29	REV 01	740-058734	1ACQ112000D	QSFP-100GBASE-SR4
Xcvr 33	REV 01	740-058734	1ACQ1134065	QSFP-100GBASE-SR4
Xcvr 34	REV 01	740-067442	XV20L4L	QSFP+-40G-SR4
FPC 1	REV 33	750-051354	ACNX8831	LC1102 - 12C / 36Q /
144X				
CPU		BUILTIN	BUILTIN	FPC CPU
PIC 0		BUILTIN	BUILTIN	12x100GE/36x40GE/144x10GE
Xcvr 5		NON-JNPR	37700171YY0084	QSFP-100GBASE-LR4
Xcvr 25		NON-JNPR	GDA2017459	QSFP-100GBASE-LR4
Xcvr 29		NON-JNPR	GDF2008750	QSFP-100GBASE-LR4
FPC 2	REV 32	750-051357	ACPB0341	LC1101 - 30C / 30Q / 96X

CPU PIC 0		BUILTIN BUILTIN	BUILTIN BUILTIN	FPC CPU 30x100GE/30x40GE/96x10GE
Xcvr 0		NON-JNPR	37700170YZC305	QSFP-100GBASE-LR4
Xcvr 4		NON-JNPR	37700170YZC306	QSFP-100GBASE-LR4
Xcvr 9	REV 01	740-054053	QF36013S	QSFP+-4X10G-SR
Xcvr 12	REV 01	740-067442	XV301AU	QSFP+-40G-SR4
Xcvr 14	REV 01	740-043308	UWE2CG9	QSFP+-40G-LR4
Xcvr 16	REV 01	740-043308	UWH141S	QSFP+-40G-LR4
Xcvr 17	REV 01	740-058734	1ECQ11180VH	QSFP-100GBASE-SR4
Xcvr 18	REV 01	740-054050	INFAJ0492237	QSFP+-4X10G-LR
Xcvr 26	REV 01	740-058734	1ACQ111803N	QSFP-100GBASE-SR4
Xcvr 27	REV 01	740-058734	1ACQ113405S	QSFP-100GBASE-SR4
FPC 3	REV 35	750-051357	ACPD2186	LC1101 - 30C / 30Q / 96X
CPU PIC 0		BUILTIN BUILTIN	BUILTIN BUILTIN	FPC CPU 30x100GE/30x40GE/96x10GE
Xcvr 0	REV 01	740-061409	1GCQA1470A3	QSFP-100GBASE-LR4-T2
Xcvr 1	REV 01	740-061409	1GCQA1470XC	QSFP-100GBASE-LR4-T2
Xcvr 7		NON-JNPR	FG4550500008	QSFP-100G-CWDM4
Xcvr 24	REV 01	740-058734	1ECQ11381LX	QSFP-100GBASE-SR4
Xcvr 29	REV 01	740-043308	UWE0UYS	QSFP+-40G-LR4
FPC 5 144X	REV 08	750-068822	ACPF0057	LC1102 - 12C / 36Q /
CPU PIC 0		BUILTIN BUILTIN	BUILTIN BUILTIN	FPC CPU 12x100GE/36x40GE/144x10GE
FPC 6 144X	REV 08	750-068822	ACPE9951	LC1102 - 12C / 36Q /
CPU PIC 0		BUILTIN BUILTIN	BUILTIN BUILTIN	FPC CPU 12x100GE/36x40GE/144x10GE
Xcvr 1	REV 01	740-054053	QF3208LG	QSFP+-4X10G-SR
Xcvr 7	REV 01	740-067442	XV20LGN	QSFP+-40G-SR4
Xcvr 8	REV 01	740-067442	XV20VMV	QSFP+-40G-SR4
Xcvr 9	REV 01	740-067442	XV20KCN	QSFP+-40G-SR4
Xcvr 10	REV 01	740-067442	XU504QD	QSFP+-40G-SR4
Xcvr 11	REV 01	740-067442	XU504X7	QSFP+-40G-SR4
Xcvr 12	REV 01	740-067442	XU504W8	QSFP+-40G-SR4
Xcvr 16	REV 01	740-032986	QF4301JP	QSFP+-40G-SR4
Xcvr 17	REV 01	740-032986	QF4303AE	QSFP+-40G-SR4
Xcvr 18	REV 01	740-054050	INFAJ0492400	QSFP+-4X10G-LR
Xcvr 19	REV 01	740-054050	INFAJ0492142	QSFP+-4X10G-LR
Xcvr 24	REV 01	740-032986	QF4301KB	QSFP+-40G-SR4
Xcvr 25	REV 01	740-032986	QF4303YP	QSFP+-40G-SR4
Xcvr 30	REV 01	740-067442	XV300ZX	QSFP+-40G-SR4
Xcvr 31	REV 01	740-043308	UWH2KBW	QSFP+-40G-LR4
Xcvr 34	REV 01	740-054053	QG1501YU	QSFP+-4X10G-SR
FPD Board	REV 07	711-054687	ACPC7142	Front Panel Display
Power Supply 0	REV 02	740-049388	1EDL62102N9	Power Supply AC
Power Supply 1	REV 02	740-049388	1EDL60300KX	Power Supply AC
Power Supply 2	REV 02	740-049388	1EDL60300DL	Power Supply AC
Power Supply 3	REV 02	740-049388	1EDL61701BT	Power Supply AC
Power Supply 4	REV 02	740-049388	1EDL62102P7	Power Supply AC
Power Supply 5	REV 02	740-049388	1EDL62102PP	Power Supply AC
FTC 0	REV 14	750-050108	ACPE4038	Fan Controller 8
FTC 1	REV 14	750-050108	ACPE4032	Fan Controller 8
Fan Tray 0	REV 09	760-054372	ACPD6799	Fan Tray 8
Fan Tray 1	REV 09	760-054372	ACNZ3584	Fan Tray 8

SIB 0	REV 24	750-050058	ACPD4587	Switch Fabric 8
SIB 1	REV 24	750-050058	ACNZ0635	Switch Fabric 8
SIB 2	REV 24	750-050058	ACPD4908	Switch Fabric 8
SIB 3	REV 24	750-050058	ACNZ0617	Switch Fabric 8
SIB 4	REV 24	750-050058	ACNZ0527	Switch Fabric 8
SIB 5	REV 23	750-050058	ACNX6980	Switch Fabric 8

### show chassis hardware detail (PTX10016 Routers)

```
user@switch> show chassis hardware detail
```

Hardware inventory:				
Item	Version	Part number	Serial number	Description
Chassis			DH995	JNP10016 [PTX10016]
Midplane	REV 22	750-056555	ACPM7810	Midplane 16
Routing Engine 0		BUILTIN	BUILTIN	RE-PTX-2X00x4
vtbd0 15360 MB				Virtio Block Disk
vtbd1 15360 MB				Virtio Block Disk
ada0 128 MB	QEMU		QM00002	Virtio Block Disk
usb0 (addr 0.1)	EHCI root HUB 0		Intel	uhub0
usb1 (addr 0.2)	product 0x0020 32		vendor 0x8087	uhub1
Routing Engine 1		BUILTIN	BUILTIN	RE-PTX-2X00x4
vtbd0 15360 MB				Virtio Block Disk
vtbd1 15360 MB				Virtio Block Disk
ada0 128 MB	QEMU		QM00002	Virtio Block Disk
usb0 (addr 0.1)	EHCI root HUB 0		Intel	uhub0
usb1 (addr 0.2)	product 0x0020 32		vendor 0x8087	uhub1
CB 0	REV 03	750-068820	ACPL7238	Control Board
CB 1	REV 03	750-068820	ACPL7298	Control Board
FPC 1	REV 36	750-077140	ACNP4590	LC1102 - 12C / 36Q / 144X
CPU		BUILTIN	BUILTIN	FPC CPU
PIC 0		BUILTIN	BUILTIN	12x100GE/36x40GE/144x10GE
Xcvr 0	REV 01	740-054053	QF3600AV	QSFP+-4X10G-SR
Xcvr 35	REV 01	740-061405	1ACQ110507K	QSFP-100GBASE-SR4
FPC 3	REV 07	750-071975	CAHA2224	LC1102 - 12C / 36Q / 144X
CPU		BUILTIN	BUILTIN	FPC CPU
PIC 0		BUILTIN	BUILTIN	12x100GE/36x40GE/144x10GE
Xcvr 0	REV 01	740-054053	QG1505YM	QSFP+-4X10G-SR
Xcvr 11		NON-JNPR	GDA2017459	QSFP-100GBASE-LR4
Xcvr 35		NON-JNPR	GDF2008750	QSFP-100GBASE-LR4
FPC 5	REV 13	750-068822	ACPD6501	LC1102 - 12C / 36Q / 144X
CPU		BUILTIN	BUILTIN	FPC CPU
PIC 0		BUILTIN	BUILTIN	12x100GE/36x40GE/144x10GE
Xcvr 1	REV 01	740-058734	1ECQ11381LA	QSFP-100GBASE-SR4
Xcvr 2	REV 01	740-043308	UWH141S	QSFP+-40G-LR4
Xcvr 3	REV 01	740-043308	UWE2CG9	QSFP+-40G-LR4
FPC 6	REV 37	750-077140	ACNS2793	LC1102 - 12C / 36Q / 144X
CPU		BUILTIN	BUILTIN	FPC CPU
PIC 0		BUILTIN	BUILTIN	12x100GE/36x40GE/144x10GE
Xcvr 0	REV 01	740-032986	QH0400VH	QSFP+-40G-SR4
Xcvr 1	REV 01	740-032986	QH0400VM	QSFP+-40G-SR4

Xcvr 35	REV 01	740-058734	1ECQ11390ZB	QSFP-100GBASE-SR4
FPC 8	REV 36	750-077140	ACNP4625	LC1102 - 12C / 36Q /
144X				
CPU		BUILTIN	BUILTIN	FPC CPU
PIC 0		BUILTIN	BUILTIN	12x100GE/36x40GE/144x10GE
Xcvr 1	REV 01	740-058732	1AMQA14206D	QSFP-100GBASE-LR4
Xcvr 10	REV 01	740-032986	QF4301KB	QSFP+-40G-SR4
Xcvr 24	REV 01	740-054050	INFAJ0492244	QSFP+-4X10G-LR
FPC 9	REV 35	750-071976	ACPD3055	LC1101 - 30C / 30Q / 96X
CPU		BUILTIN	BUILTIN	FPC CPU
PIC 0		BUILTIN	BUILTIN	30x100GE/30x40GE/96x10GE
Xcvr 0		NON-JNPR	INGBT7970007	QSFP-100GBASE-LR4
Xcvr 1		NON-JNPR	UWQ24D9	QSFP-100GBASE-LR4
Xcvr 2		NON-JNPR	INGBT7970011	QSFP-100GBASE-LR4
Xcvr 3		NON-JNPR	UX60AF1	QSFP-100G-CWDM4
Xcvr 4		NON-JNPR	UX408JJ	QSFP-100GBASE-LR4
Xcvr 11	REV 01	740-058734	1ECQ113835F	QSFP-100GBASE-SR4
Xcvr 18		NON-JNPR	Q7496	QSFP-100G-CWDM4
Xcvr 29	REV 01	740-058734	1ECQ11380LZ	QSFP-100GBASE-SR4
Power Supply 0	REV 02	740-049388	1EDL625039E	Power Supply AC
Power Supply 1	REV 02	740-049388	1EDL62503AD	Power Supply AC
Power Supply 2	REV 02	740-049388	1EDL625039P	Power Supply AC
Power Supply 3	REV 02	740-049388	1EDL702004E	Power Supply AC
Power Supply 4	REV 02	740-049388	1EDL625039D	Power Supply AC
Power Supply 5	REV 02	740-049388	1EDL63706JD	Power Supply AC
Power Supply 6	REV 02	740-049388	1EDL63706JH	Power Supply AC
FTC 0	REV 10	750-050309	ACPM2918	Fan Controller 16
FTC 1	REV 10	750-050309	ACPE8185	Fan Controller 16
Fan Tray 0	REV 10	760-077141	ACPV7288	Fan Tray 16
Fan Tray 1	REV 10	760-057901	ACPL0546	Fan Tray 16
SIB 0	REV 15	750-058270	ACPM2804	Switch Fabric 16
SIB 1	REV 15	750-058270	ACPM2808	Switch Fabric 16
SIB 2	REV 15	750-058270	ACPL4450	Switch Fabric 16
SIB 3	REV 15	750-058270	ACPJ9834	Switch Fabric 16
SIB 4	REV 15	750-058270	ACPM2814	Switch Fabric 16
SIB 5	REV 15	750-058270	ACPL4277	Switch Fabric 16
FPD Board	REV 07	711-054687	ACPL1407	Front Panel Display

### show chassis hardware (M7i Router)

```
user@host> show chassis hardware
```

Hardware inventory:				
Item	Version	Part number	Serial number	Description
Chassis			31959	M7i
Midplane	REV 02	710-008761	CA0209	M7i Midplane
Power Supply 0	Rev 04	740-008537	PD10272	AC Power Supply
Routing Engine	REV 01	740-008846	1000396803	RE-5.0
CFEB	REV 02	750-009492	CA0166	Internet Processor IIV1
FPC 0				E-FPC
PIC 0	REV 04	750-003163	HJ6416	1x G/E, 1000 BASE-SX
PIC 1	REV 04	750-003163	HJ6423	1x G/E, 1000 BASE-SX
PIC 2	REV 04	750-003163	HJ6421	1x G/E, 1000 BASE-SX
PIC 3	REV 02	750-003163	HJ0425	1x G/E, 1000 BASE-SX
FPC 1				E-FPC
PIC 2	REV 01	750-009487	HM2275	ASP - Integrated
PIC 3	REV 01	750-009098	CA0142	2x F/E, 100 BASE-TX

Hardware inventory:				
Item	Version	Part number	Serial number	Description
Chassis			B1157	M7i
Midplane	REV 05	710-008761	DM0840	M7i Midplane
Power Supply 0	Rev 08	740-008537	TE53755	AC Power Supply
Routing Engine	REV 07	740-011202	1000736567	RE-850
CFEB	REV 09	750-010463	DK6952	Internet Processor II
FPC 0				E-FPC
PIC 0	REV 12	750-012838	DL7993	4x 1GE(LAN), IQ2
Xcvr 0	REV 01	740-011614	PD94TDJ	SFP-LX10
Xcvr 1	REV 01	740-011615	PAD5EER	UNSUPPORTED
Xcvr 2	REV 01	740-011614	PD94THU	SFP-LX10
Xcvr 3		NON-JNPR	PDC2E7A	SFP-LX10
PIC 1	REV 03	750-023116	JT0203	4x CHSTM1 SDH CE SFP
Xcvr 0	REV 01	740-012434	AGT063832PS	SFP-SR
Xcvr 1	REV 01	740-012434	AGT063832LY	SFP-SR
Xcvr 3	REV 01	740-016064	C06J19018	SFP-LR
PIC 2	REV 15	750-014895	DM5757	MultiServices 100
PIC 3	REV 01	750-025390	JW9448	12x T1/E1 CE
FPC 1				E-FPC
PIC 2		BUILTIN	BUILTIN	1x Tunnel
PIC 3	REV 09	750-009099	DM0899	1x G/E, 1000 BASE
Xcvr 0	REV 01	740-012434	AGT07150HGJ	UNSUPPORTED
Fan Tray				Rear Fan Tray

### show chassis hardware (M10 Router)

```
user@host> show chassis hardware
```

Hardware inventory:				
Item	Version	Part number	Serial number	Description
Chassis			1122	M10
Midplane	REV 1.1	710-001950	S/N AC6626	
Power supply A	Rev 01	740-002497	S/N LC36095	AC
Power supply B	Rev 01	740-002497	S/N LC36100	AC
Display	REV 1.2	710-001995	S/N AC6656	
Host			18000005dfb3fb01	teknor
FEB	REV 01	710-001948	S/N AC6632	Internet Processor II
FPC 0				
PIC 0	REV 08	750-001072	S/N AB2485	1x G/E, 1000 BASE-SX
PIC 1	REV 01	750-000613	S/N AA1048	1x OC-12 SONET, SMIR
FPC 1				
Fan Tray 0				FANTRAY-M10I-S
Fan Tray 1				FANTRAY-M10I-S

### show chassis hardware models (M10 Router)

```
user@host> show chassis hardware models
```

Hardware inventory:				
Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 04	710-008920		CHAS-MP-M10i-S
Power Supply 0	Rev 06	740-008537		PWR-M10i-M7i-AC-S
Power Supply 1	Rev 06	740-008537		PWR-M10i-M7i-AC-S
HCM 0	REV 03	710-010580		HCM-M10i-S
HCM 1	REV 03	710-010580		HCM-M10i-S
Routing Engine 0	REV 09	740-009459		RE-400-256-S
CFEB 0	REV 05	750-010465		FEB-M10i-M7i-S
FPC 0				



PIC 0	REV 10	750-002971	PE-40C3-SON-MM
PIC 1	REV 11	750-002992	PE-4FE-TX
PIC 2	REV 03	750-002977	PE-20C3-ATM-MM
PIC 3	REV 08	750-005724	PE-20C3-ATM2-MM
FPC 1			
PIC 2	REV 12	750-008425	PE-AS
PIC 3	REV 13	750-005636	PE-4CHDS3-QPP
Fan Tray 0			FANTRAY-M10I-S
Fan Tray 1			FANTRAY-M10I-S

### show chassis hardware (M20 Router)

```
user@host> show chassis hardware
```

Hardware inventory:				
Item	Version	Part number	Serial number	Description
Chassis			20033	M20
Backplane	REV 07	710-001517	S/N AA7940	
Power supply B	Rev 01	740-001465	S/N 000001	AC
Display	REV 02	710-001519	S/N AA9704	
Host 0			98000004f8f27501	teknor
SSB slot 0	REV 01	710-001951	S/N AD5905	Internet Processor II
SSRAM bank 0	REV 01	710-001385	S00480	2 MB
SSRAM bank 1	REV 01	710-001385	S00490	2 MB
SSRAM bank 2	REV 01	710-001385	S001:?	2 MB
SSRAM bank 3	REV 01	710-001385	S00483	2 MB
SSB slot 1	N/A	N/A	N/A	Backup
FPC 1	REV 01	710-001292	S/N AB7528	
SSRAM	REV 01	710-000077	S/N 304209	1 MB
SDRAM bank 0	REV 01	710-000099	S/N 000603	64 MB
SDRAM bank 1	REV 01	710-000099	S/N 000414	64 MB
PIC 0	REV 03	750-000612	S/N AB8433	2x OC-3 ATM, MM
PIC 1	REV 01	750-000616	S/N AA1168	1x OC-12 ATM, MM
PIC 2	REV 01	750-000613	S/N AA1008	1x OC-12 SONET, SMIR
PIC 3	REV 01	750-002501	S/N AD5810	4x E3
FPC 2	REV 01	710-001292	S/N AC0119	
SSRAM	REV 01	710-000077	S/N 503241	1 MB
SDRAM bank 0	REV 01	710-000099	S/N 306835	64 MB
SDRAM bank 1	REV 01	710-000099	S/N 306832	64 MB
Fan Tray 0				Front Upper Fan Tray
Fan Tray 1				Front Middle Fan Tray
Fan Tray 2				Front Bottom Fan Tray
Fan Tray 3				Rear Fan Tray

### show chassis hardware models (M20 Router)

```
user@host> show chassis hardware models
```

Hardware inventory:				
Item	Version	Part number	CLEI code	FRU model number
Backplane	REV 03	710-002334		CHAS-MP-M20-S
Power Supply A	REV 06	740-001465		PWR-M20-AC-S
Display	REV 04	710-001519		CRAFT-M20-S
Routing Engine 0	REV 06	740-003239		RE-333-768-S
Routing Engine 1	REV 06	740-003239		RE-333-768-S
SSB 0	REV 02	710-001951		SSB-E-M20
SSB 1	N/A	N/A		
FPC 0	REV 03	710-003308		FPC-E
PIC 0	REV 08	750-002303		P-4FE-TX

PIC 1	REV 07	750-004745	P-2MCDS3
PIC 2	REV 03	750-002965	PE-4CHDS3
FPC 1	REV 03	710-003308	FPC-E
PIC 0	REV 03	750-002914	P-20C3-ATM-MM
Fan Tray 0			FANTRAY-F-M20-S
Fan Tray 1			FANTRAY-F-M20-S
Fan Tray 2			FANTRAY-F-M20-S
Fan Tray 3			FANTRAY-R-M20-S

## show chassis hardware (M40 Router)

```
user@host> show chassis hardware
```

```
Hardware inventory:
```

Item	Version	Part number	Serial number	Description
Backplane	REV 02	710-000073	S/N AA0053	
Power supply A	Rev 2	740-000235	S/N 000042	DC
Maxicab	REV X1	710-000229	S/N AA0139	
Minicab	REV X1	710-000482	S/N AA0201	
Display	REV 06	710-000150	S/N AA0905	
Host				cpv5000
SCB	REV X1	710-000075	S/N AA0158	Internet Processor I
SSRAM bank 0	REV 02	710-000077	S/N AA2267	1 MB
SSRAM bank 1	REV 02	710-000077	S/N AA2270	1 MB
SSRAM bank 2	REV 02	710-000077	S/N AA2269	1 MB
SSRAM bank 3	REV 02	710-000077	S/N AA2268	1 MB
FPC 0	REV 01	710-000175	S/N AA0048	
SSRAM	REV 01	710-000077	S/N AA2333	1 MB
SDRAM bank 0	REV 01	710-000099	S/N AA2332	64 MB
SDRAM bank 1	REV X1	710-000099	S/N AA2337	64 MB
PIC 0	REV 04	750-000613	S/N aa0343	1x OC-12 SONET, SMIR
PIC 1	REV 04	750-000613	S/N AA0379	1x OC-12 SONET, SMIR
PIC 2	REV 04	750-000613	S/N AA0377	1x OC-12 SONET, SMIR
PIC 3	REV 04	750-000613	S/N AA0378	1x Tunnel
FPC 2	REV 01	710-000175	S/N AA0042	
SSRAM	REV 02	710-000077	S/N AA2288	1 MB
SDRAM bank 0	REV 01	710-000099	S/N AA2331	64 MB
SDRAM bank 1	REV 01	710-000099	S/N AA2330	64 MB
PIC 0	REV X1	750-000603	S/N AA0143	4x OC-3 SONET, SMIR
PIC 1	REV X1	750-000615	S/N AA0149	4x OC-3 SONET, MM
PIC 2	REV X1	750-000611	S/N AA0148	4x OC-3 SONET, MM
PIC 3	REV 04	750-000613	S/N AA0330	1x OC-12 SONET, SMIR
FPC 4	REV 01	710-000175	S/N AA0050	
SSRAM	REV 01	710-000077	S/N AA2327	1 MB
SDRAM bank 0	REV 01	710-000099	S/N AA2329	64 MB
SDRAM bank 1	REV 01	710-000099	S/N AA2328	64 MB
PIC 0	REV 04	750-000613	S/N AA0320	1x OC-12 SONET, SMIR
PIC 2	REV 05	750-000616	S/N AA1341	1x OC-12 ATM, MM
PIC 3	REV 08	750-001072	S/N AB2462	1x G/E, 1000 BASE-SX
FPC 5	REV 10	710-000175	S/N AA7663	
SSRAM	REV 01	710-000077	S/N 501590	1 MB
SDRAM bank 0	REV 01	710-000099	S/N 300949	64 MB
SDRAM bank 1	REV 01	710-000099	S/N 300868	64 MB
PIC 1	REV 01	750-001323	S/N AB1670	1x Tunnel

## show chassis hardware (M40e Router)

```
user@host> show chassis hardware
```

Hardware inventory:				
Item	Version	Part number	Serial number	Description
Chassis				m40e
Midplane	REV 01	710-005071	AX3671	
FPM CMB	REV 03	710-001642	AR9074	
FPM Display	REV 03	710-001647	AR7331	
CIP	REV 04	710-002649	BB4449	
PEM 0	Rev 01	740-003787	MC12364	Power Entry Module
PEM 1	Rev 01	740-003787	MC12383	Power Entry Module
PCG 0	REV 07	710-001568	AG1332	
PCG 1	REV 07	710-001568	AR3789	
Host 0			3e000007c8176601	Present
MCS 0	REV 11	710-001226	AN5813	
SFM 0 SPP	REV 07	710-001228	AG4676	
SFM 0 SPR	REV 05	710-002189	AE4735	Internet Processor II
SFM 1 SPP	REV 07	710-001228	AP1347	
SFM 1 SPR	REV 05	710-002189	BE0063	Internet Processor II
FPC 0	REV 01	710-011725	BE0669	M40e-EP-FPC Type 1
CPU	REV 01	710-004600	BD9504	
PIC 0	REV 03	750-003737	AY3991	4x G/E, 1000 BASE-SX
FPC 1	REV 01	710-005197	BD9842	M40e-FPC Type 2
CPU	REV 01	710-004600	BB4869	
PIC 0	REV 07	750-001900	AR8278	1x OC-48 SONET, SMSR
FPC 2	REV 02	710-005197	BD9824	M40e-FPC Type 2
CPU	REV 01	710-004600	BD9531	
PIC 0	REV 03	750-003737	AY3986	4x G/E, 1000 BASE-SX
FPC 4	REV 02	710-005078	BE0664	M40e-FPC Type 1
CPU	REV 01	710-004600	BD9559	
PIC 0	REV 03	750-001894	AG7963	1x G/E, 1000 BASE-SX
PIC 2	REV 01	750-002575	AF2472	4x OC-3 SONET, SMIR
FPC 6	REV 02	710-005078	BE0652	M40e-FPC Type 1
CPU	REV 01	710-004600	BD9607	
PIC 0	REV 02	750-002911	AN2286	4x F/E, 100 BASE-TX
PIC 2	REV 01	750-002577	AP6345	4x OC-3 SONET, MM

### show chassis hardware (M120 Router)

```
user@host> show chassis hardware
```

Hardware inventory:				
Item	Version	Part number	Serial number	Description
Chassis			JN000054AC	M120
Midplane	REV 01	710-013667	RB4170	M120 Midplane
FPM Board	REV 02	710-011407	CJ9186	M120 FPM Board
FPM Display	REV 02	710-011405	CJ9173	M120 FPM Display
FPM CIP	REV 02	710-011410	CJ9221	M120 FPM CIP
PEM 0	Rev 05	740-011936	RM28320	AC Power Entry Module
PEM 1	Rev 05	740-011936	RM28321	AC Power Entry Module
Routing Engine 0	REV 03	740-014080	1000642883	RE-A-1000
CB 0	REV 03	710-011403	CM8346	M120 Control Board
CB 1	REV 06	710-011403	CP6728	M120 Control Board
FPC 1	REV 02	710-015908	CP6925	M120 CFPC 10GE
PIC 0		BUILTIN	BUILTIN	1x 10GE(LAN/WAN) XFP
Xcvr 0	REV 01	740-014279	62E204N00007	XFP-10G-LR
FPC 3	REV 03	710-011393	CJ9234	M120 FPC Type 2
PIC 0	REV 16	750-008155	NB5229	2x G/E IQ, 1000 BASE
Xcvr 0	REV 01	740-011613	P9F15JB	SFP-SX
Xcvr 1	REV 01	740-007326	P4Q0R9G	SFP-SX
PIC 1	REV 09	750-007745	CG4360	4x OC-3 SONET, SMIR
PIC 2	REV 16	750-008155	ND7787	2x G/E IQ, 1000 BASE

Xcvr 0	REV 01	740-011613	P9F12AS	SFP-SX
Xcvr 1	REV 01	740-011613	P9F1ALU	SFP-SX
PIC 3	REV 07	750-011800	JW1284	8x 1GE(LAN), IQ2
Xcvr 0	REV 01	740-011613	P9F1AM6	SFP-SX
Xcvr 6	REV 01	740-011613	P9F16NN	SFP-SX
Xcvr 7	REV 01	740-011782	P8C29Y7	SFP-SX
Board B	REV 02	710-011395	CN3754	M120 FPC Mezz
FPC 4	REV 02	710-011398	CP6741	M120 FPC Type 3
PIC 0	REV 16	750-007141	NB2855	10x 1GE(LAN), 1000 BASE
Xcvr 0	REV 01	740-011782	P922A1F	SFP-SX
Xcvr 1	REV 01	740-011782	P922A16	SFP-SX
Xcvr 2	REV 01	740-011782	P922A0U	SFP-SX
Xcvr 3	REV 01	740-011782	P9229UZ	SFP-SX
Xcvr 4	REV 01	740-009029	P11JXWP	SFP-LX
Xcvr 6	REV 01	740-011613	P9F1ALW	SFP-SX
FPC 5	REV 01	710-011388	CJ9088	M120 FPC Type 1
PIC 0	*** Hardware Not Supported ***			
PIC 1	REV 05	750-012052	NB0410	1x CHOC3 IQ SONET, SMLR
PIC 2	REV 01	750-013167	CM3824	4x CHDS3 IQ
PIC 3	REV 01	750-010240	CB5366	1x G/E SFP, 1000 BASE
Board B	REV 01	710-011390	CJ9103	M120 FPC Mezz Board
FEB 3	REV 04	710-011663	CP6673	M120 FEB
FEB 4	REV 04	710-011663	CJ9368	M120 FEB
FEB 5	REV 04	710-011663	CJ9386	M120 FEB
Fan Tray 0				Front Top Fan Tray
Fan Tray 1				Front Bottom Fan Tray
Fan Tray 2				Rear Top Fan Tray
Fan Tray 3				Rear Bottom Fan Tray

### show chassis hardware detail (M120 Router)

```
user@host> show chassis hardware detail
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN000054AC	M120
Midplane	REV 01	710-013667	RB4170	M120 Midplane
FPM Board	REV 02	710-011407	CJ9186	M120 FPM Board
FPM Display	REV 02	710-011405	CJ9173	M120 FPM Display
FPM CIP	REV 02	710-011410	CJ9221	M120 FPM CIP
PEM 0	Rev 05	740-011936	RM28320	AC Power Entry Module
PEM 1	Rev 05	740-011936	RM28321	AC Power Entry Module
Routing Engine 0	REV 03	740-014080	1000642883	RE-A-1000
ad0	248 MB	SILICONSYSTEMS INC	256M 126CT505S0763SC00110	Compact Flash
ad2	38154 MB	HTES41040G9SA00	MPBBTOX2HS2E3M	Hard Disk
CB 0	REV 03	710-011403	CM8346	M120 Control Board
CB 1	REV 06	710-011403	CP6728	M120 Control Board
FPC 1	REV 02	710-015908	CP6925	M120 CFPC 10GE
PIC 0		BUILTIN	BUILTIN	1x 10GE(LAN/WAN) XFP
Xcvr 0	REV 01	740-014279	62E204N00007	XFP-10G-LR
FPC 3	REV 03	710-011393	CJ9234	M120 FPC Type 2
PIC 0	REV 16	750-008155	NB5229	2x G/E IQ, 1000 BASE
Xcvr 0	REV 01	740-011613	P9F15JB	SFP-SX
Xcvr 1	REV 01	740-007326	P4Q0R9G	SFP-SX
PIC 1	REV 09	750-007745	CG4360	4x OC-3 SONET, SMIR
PIC 2	REV 16	750-008155	ND7787	2x G/E IQ, 1000 BASE
Xcvr 0	REV 01	740-011613	P9F12AS	SFP-SX
Xcvr 1	REV 01	740-011613	P9F1ALU	SFP-SX

PIC 3	REV 07	750-011800	JW1284	8x 1GE(LAN), IQ2
Xcvr 0	REV 01	740-011613	P9F1AM6	SFP-SX
Xcvr 6	REV 01	740-011613	P9F16NN	SFP-SX
Xcvr 7	REV 01	740-011782	P8C29Y7	SFP-SX
Board B	REV 02	710-011395	CN3754	M120 FPC Mezz
FPC 4	REV 02	710-011398	CP6741	M120 FPC Type 3
PIC 0	REV 16	750-007141	NB2855	10x 1GE(LAN), 1000 BASE
Xcvr 0	REV 01	740-011782	P922A1F	SFP-SX
Xcvr 1	REV 01	740-011782	P922A16	SFP-SX
Xcvr 2	REV 01	740-011782	P922A0U	SFP-SX
Xcvr 3	REV 01	740-011782	P9229UZ	SFP-SX
Xcvr 4	REV 01	740-009029	P11JXWP	SFP-LX
Xcvr 6	REV 01	740-011613	P9F1ALW	SFP-SX
FPC 5	REV 01	710-011388	CJ9088	M120 FPC Type 1
PIC 0	*** Hardware Not Supported ***			
PIC 1	REV 05	750-012052	NB0410	1x CHOC3 IQ SONET, SMLR
PIC 2	REV 01	750-013167	CM3824	4x CHDS3 IQ
PIC 3	REV 01	750-010240	CB5366	1x G/E SFP, 1000 BASE
Board B	REV 01	710-011390	CJ9103	M120 FPC Mezz Board
FEB 3	REV 04	710-011663	CP6673	M120 FEB
FEB 4	REV 04	710-011663	CJ9368	M120 FEB
FEB 5	REV 04	710-011663	CJ9386	M120 FEB
Fan Tray 0				Front Top Fan Tray
Fan Tray 1				Front Bottom Fan Tray
Fan Tray 2				Rear Top Fan Tray
Fan Tray 3				Rear Bottom Fan Tray

### show chassis hardware models (M120 Router)

```
user@host> show chassis hardware models
```

Hardware inventory:				
Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 01	710-013667		
FPM CIP	REV 02	710-011410		CRAFT-M120-S
PEM 0	Rev 05	740-011936		PWR-M120-AC-S
PEM 1	Rev 05	740-011936		PWR-M120-AC-S
Routing Engine 0	REV 03	740-014080		RE-A-1000-2048-S
CB 0	REV 03	710-011403		CB-M120-S
CB 1	REV 06	710-011403		CB-M120-S
FPC 1	REV 02	710-015908		M120-cFPC-1XGE-XFP
FPC 3				
PIC 0	REV 16	750-008155		PB-2GE-SFP-QPP
PIC 1	REV 09	750-007745		PC-4OC3-SON-SMIR
PIC 2	REV 16	750-008155		PB-2GE-SFP-QPP
PIC 3	REV 07	750-011800		PB-8GE-TYPE2-SFP-IQ2
FPC 4				
PIC 0	REV 16	750-007141		PC-10GE-SFP
FPC 5				
PIC 1	REV 05	750-012052		PB-1CHOC3-SMIR-QPP
PIC 2	REV 01	750-013167		PE-4CHDS3-QPP
PIC 3	REV 01	750-010240		PB-1GE-SFP
Fan Tray 0				FFANTRAY-M120-S
Fan Tray 1				FFANTRAY-M120-S
Fan Tray 2				RFANTRAY-M120-S
Fan Tray 3				RFANTRAY-M120-S

## show chassis hardware (M160 Router)

user@host&gt; show chassis hardware

Item	Version	Part number	Serial number	Description
Chassis			101	M160
Midplane	REV 02	710-001245	S/N AB4107	
FPM CMB	REV 01	710-001642	S/N AA2911	
FPM Display	REV 01	710-001647	S/N AA2999	
CIP	REV 02	710-001593	S/N AA9563	
PEM 0	Rev 01	740-001243	S/N KJ35769	DC
PEM 1	Rev 01	740-001243	S/N KJ35765	DC
PCG 0	REV 01	710-001568	S/N AA9794	
PCG 1	REV 01	710-001568	S/N AA9804	
Host 1			da000004f8d57001	teknor
MCS 1	REV 03	710-001226	S/N AA9777	
SFM 0 SPP	REV 04	710-001228	S/N AA2975	
SFM 0 SPR	REV 02	710-001224	S/N AA9838	Internet Processor I
SFM 1 SPP	REV 04	710-001228	S/N AA2860	
SFM 1 SPR	REV 01	710-001224	S/N AB0139	Internet Processor I
FPC 0	REV 03	710-001255	S/N AA9806	FPC Type 1
CPU	REV 02	710-001217	S/N AA9590	
PIC 1	REV 05	750-000616	S/N AA1527	1x OC-12 ATM, MM
PIC 2	REV 05	750-000616	S/N AA1535	1x OC-12 ATM, MM
PIC 3	REV 01	750-000616	S/N AA1519	1x OC-12 ATM, MM
FPC 1	REV 02	710-001611	S/N AA9523	FPC Type 2
CPU	REV 02	710-001217	S/N AA9571	
PIC 0	REV 03	750-001900	S/N AA9626	1x STM-16 SDH, SMIR
PIC 1	REV 01	710-002381	S/N AD3633	2x G/E, 1000 BASE-SX
FPC 2				FPC Type OC192
CPU	REV 03	710-001217	S/N AB3329	
PIC 0	REV 01			1x OC-192 SM SR-2
Fan Tray 0				Rear Bottom Blower
Fan Tray 1				Rear Top Blower
Fan Tray 2				Front Top Blower
Fan Tray 3				Front Fan Tray

## show chassis hardware models (M160 Router)

user@host&gt; show chassis hardware models

Hardware inventory:				
Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 03	710-009120		CHAS-BP-M320-S
FPM Display	REV 02	710-009351		CRAFT-M320-S
CIP	REV 03	710-005926		CIP-M320-S
PEM 2	Rev X4	740-009148		PWR-M-DC-S
PEM 3	Rev X4	740-009148		PWR-M-DC-S
Routing Engine 0	REV 02	740-008883		RE-1600-2048-S
Routing Engine 1	REV 02	740-008883		RE-1600-2048-S
FPC 0	REV 02	710-010419		M320-FPC1
PIC 0	REV 01	750-001323		P-TUNNEL
PIC 1	REV 02	750-002987		PE-10C12-SON-SMIR
PIC 2	REV 04	750-001894		PB-1GE-SX
PIC 3	REV 04	750-001896		PB-10C12-SON-SMIR
FPC 1	REV 02	710-010419		M320-FPC1
PIC 0	REV 04	750-001894		PB-1GE-SX
PIC 1	REV 04	750-001894		PB-1GE-SX
PIC 3	REV 03	750-001894		PB-1GE-SX
FPC 2	REV 02	710-010419		M320-FPC1

PIC 0	REV 10	750-005634	PB-1CHOC12SMIR-QPP
PIC 1	REV 10	750-005634	PB-1CHOC12SMIR-QPP
PIC 2	REV 07	750-005634	PB-1CHOC12SMIR-QPP
PIC 3	REV 07	750-005634	PB-1CHOC12SMIR-QPP
PIC 1	REV 10	750-005634	PB-1CHOC12SMIR-QPP
PIC 2	REV 07	750-005634	PB-1CHOC12SMIR-QPP
PIC 3	REV 07	750-005634	PB-1CHOC12SMIR-QPP
FPC 3			
PIC 0	REV 03	750-001895	PB-10C12-SON-MM
PIC 1	REV 04	750-001894	PB-1GE-SX
PIC 3	REV 04	750-003141	PB-1GE-SX-B
FPC 4	REV 02	710-010419	M320-FPC1
FPC 5	REV 02	710-010419	M320-FPC1
FPC 6	REV 02	710-010419	M320-FPC1
FPC 7			
PIC 0	REV 15	750-001901	PB-40C12-SON-SMIR
PIC 1	REV 06	750-001900	PB-10C48-SON-SMSR
PIC 2	REV 07	750-001900	PB-10C48-SON-SMSR
PIC 3	REV 05	750-003737	PB-4GE-SX
SIB 0	REV 03	710-009184	SIB-M-S
SIB 1	REV 03	710-009184	SIB-M-S
SIB 2	REV 03	710-009184	SIB-M-S
SIB 3	REV 03	710-009184	SIB-M-S
Fan Tray 0			FFANTRAY-M320-S
Fan Tray 1			FFANTRAY-M320-S
Fan Tray 2			RFANTRAY-M320-S

### show chassis hardware detail (M160 Router)

```
user@host> show chassis hardware detail
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			101	M160
Midplane	REV 02	710-001245	S/N AB4107	
FPM CMB	REV 01	710-001642	S/N AA2911	
FPM Display	REV 01	710-001647	S/N AA2999	
CIP	REV 02	710-001593	S/N AA9563	
PEM 0	Rev 01	740-001243	S/N KJ35769	DC
PEM 1	Rev 01	740-001243	S/N KJ35765	DC
PCG 0	REV 01	710-001568	S/N AA9794	
PCG 1	REV 01	710-001568	S/N AA9804	
Host 1			da000004f8d57001	teknor
MCS 1	REV 03	710-001226	S/N AA9777	
SFM 0 SPP	REV 04	710-001228	S/N AA2975	
SFM 0 SPR	REV 02	710-001224	S/N AA9838	Internet Processor I
SSRAM bank 0	REV 01	710-000077	S/N 306456	1 MB
SSRAM bank 1	REV 01	710-000077	S/N 306474	1 MB
SSRAM bank 2	REV 01	710-000077	S/N 306388	1 MB
SSRAM bank 3	REV 01	710-000077	S/N 306392	1 MB
SFM 1 SPP	REV 04	710-001228	S/N AA2860	
SFM 1 SPR	REV 01	710-001224	S/N AB0139	Internet Processor I
SSRAM bank 0	REV 01	710-000077	S/N 302917	1 MB
SSRAM bank 1	REV 01	710-000077	S/N 302662	1 MB
SSRAM bank 2	REV 01	710-000077	S/N 302593	1 MB
SSRAM bank 3	REV 01	710-000077	S/N 100160	1 MB
FPC 0	REV 03	710-001255	S/N AA9806	FPC Type 1
CPU	REV 02	710-001217	S/N AA9590	
SSRAM	REV 01	710-000077	S/N 302836	1 MB
SDRAM 0	REV 01	710-001196	S00141	32 MB

SDRAM 1	REV 01	710-001196	S0010;	32 MB
SSRAM	REV 01	710-000077	S/N 302633	1 MB
SDRAM 0	REV 01	710-001196	S00143	32 MB
SDRAM 1	REV 01	710-001196	S00115	32 MB
SSRAM	REV 01	710-000077	S/N 302952	1 MB
SDRAM 0	REV 01	710-001196	S00135	32 MB
SDRAM 1	REV 01	710-001196	S001=3	32 MB
SSRAM	REV 01	710-000077	S/N 302892	1 MB
SDRAM 0	REV 01	710-001196	S000?6	32 MB
SDRAM 1	REV 01	710-001196	S001=5	32 MB
PIC 1	REV 05	750-000616	S/N AA1527	1x OC-12 ATM, MM
PIC 2	REV 05	750-000616	S/N AA1535	1x OC-12 ATM, MM
PIC 3	REV 01	750-000616	S/N AA1519	1x OC-12 ATM, MM
FPC 1	REV 02	710-001611	S/N AA9523	FPC Type 2
CPU	REV 02	710-001217	S/N AA9571	
SSRAM	REV 01	710-000077	S/N 306340	1 MB
SDRAM 0	REV 01	710-001196	S00012	32 MB
SDRAM 1	REV 01	710-001196	S0001?	32 MB
SSRAM	REV 01	710-000077	S/N 306454	1 MB
SDRAM 0	REV 01	710-001196	S00028	32 MB
SDRAM 1	REV 01	710-001196	S0002?	32 MB
SSRAM	REV 01	710-000077	S/N 306492	1 MB
SDRAM 0	REV 01	710-001196	S00015	32 MB
SDRAM 1	REV 01	710-001196	S00031	32 MB
SSRAM	REV 01	710-000077	S/N 306363	1 MB
SDRAM 0	REV 01	710-001196	S00013	32 MB
SDRAM 1	REV 01	710-001196	S00032	32 MB
PIC 0	REV 03	750-001900	S/N AA9626	1x STM-16 SDH, SMIR
PIC 1	REV 01	710-002381	S/N AD3633	2x G/E, 1000 BASE-SX
FPC 2				FPC Type OC192
... SSRAM	REV 01	710-000077	S/N 306466	1 MB

### show chassis hardware (M320 Router)

```
user@host> show chassis hardware
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			67245	M320
Midplane	REV 05	710-009120	RB1202	M320 Midplane
FPM GBUS	REV 04	710-005928	HZ5697	M320 Board
FPM Display	REV 05	710-009351	HR1464	M320 FPM Display
CIP	REV 04	710-005926	HT8672	M320 CIP
PEM 0	Rev 05	740-009148	QK34208	DC Power Entry Module
PEM 1	Rev 05	740-009148	QK34262	DC Power Entry Module
PEM 2	Rev 05	740-009148	QF10449	DC Power Entry Module
PEM 3	Rev 05	740-009148	QJ18257	DC Power Entry Module
Routing Engine 0	REV 06	740-008883	P11123901185	RE-4.0
CB 0	REV 07	710-009115	JB2382	M320 Control Board
FPC 0	REV 02	710-005017	CD9926	M320 FPC Type 2
CPU	REV 01	710-011659	CJ6940	M320 PCA SCPU
PIC 0	REV 07	750-001900	AT1594	1x OC-48 SONET, SMSR
PIC 1	REV 03	750-001850	HS2746	1x Tunnel
PIC 2	REV 05	750-010618	JE7117	4x G/E SFP, 1000 BASE
PIC 3	REV 06	750-001900	HE6083	1x OC-48 SONET, SMSR
FPC 2	REV 02	710-005017	CH0319	M320 FPC Type 1
CPU	REV 01	710-011659	CJ6942	M320 PCA SCPU
PIC 0	REV 05	750-003034	BD8705	4x OC-3 SONET, SMIR
FPC 5	REV 02	710-005017	CD9938	M320 FPC Type 2
CPU				



FPC 7	REV 02	710-005017	CD9934	M320 FPC Type 2
CPU				
SIB 0	REV 09	710-009184	JA6540	M320 SIB
SIB 1	REV 09	710-009184	HV9511	M320 SIB
SIB 2	REV 09	710-009184	HW2057	M320 SIB
SIB 3	REV 09	710-009184	JA6687	M320 SIB
Fan Tray 0				Front Top Fan Tray
Fan Tray 1				Front Bottom Fan Tray
Fan Tray 2				Rear Fan Tray

### show chassis hardware models (M320 Router)

```
user@host> show chassis hardware models
```

Hardware inventory:

Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 03	710-009120		CHAS-BP-M320-S
FPM Display	REV 02	710-009351		CRAFT-M320-S
CIP	REV 03	710-005926		CIP-M320-S
PEM 2	Rev X4	740-009148		PWR-M-DC-S
PEM 3	Rev X4	740-009148		PWR-M-DC-S
Routing Engine 0	REV 02	740-008883		RE-1600-2048-S
Routing Engine 1	REV 02	740-008883		RE-1600-2048-S
FPC 0	REV 02	710-010419		M320-FPC1
PIC 0	REV 01	750-001323		P-TUNNEL
PIC 1	REV 02	750-002987		PE-10C12-SON-SMIR
PIC 2	REV 04	750-001894		PB-1GE-SX
PIC 3	REV 04	750-001896		PB-10C12-SON-SMIR
FPC 1	REV 02	710-010419		M320-FPC1
PIC 0	REV 04	750-001894		PB-1GE-SX
PIC 1	REV 04	750-001894		PB-1GE-SX
PIC 3	REV 03	750-001894		PB-1GE-SX
FPC 2	REV 02	710-010419		M320-FPC1
PIC 0	REV 10	750-005634		PB-1CHOC12SMIR-QPP
PIC 1	REV 10	750-005634		PB-1CHOC12SMIR-QPP
PIC 2	REV 07	750-005634		PB-1CHOC12SMIR-QPP
PIC 3	REV 07	750-005634		PB-1CHOC12SMIR-QPP
PIC 1	REV 10	750-005634		PB-1CHOC12SMIR-QPP
PIC 2	REV 07	750-005634		PB-1CHOC12SMIR-QPP
PIC 3	REV 07	750-005634		PB-1CHOC12SMIR-QPP
FPC 3				
PIC 0	REV 03	750-001895		PB-10C12-SON-MM
PIC 1	REV 04	750-001894		PB-1GE-SX
PIC 3	REV 04	750-003141		PB-1GE-SX-B
FPC 4	REV 02	710-010419		M320-FPC1
FPC 5	REV 02	710-010419		M320-FPC1
FPC 6	REV 02	710-010419		M320-FPC1
FPC 7				
PIC 0	REV 15	750-001901		PB-40C12-SON-SMIR
PIC 1	REV 06	750-001900		PB-10C48-SON-SMSR
PIC 2	REV 07	750-001900		PB-10C48-SON-SMSR
PIC 3	REV 05	750-003737		PB-4GE-SX
SIB 0	REV 03	710-009184		SIB-M-S
SIB 1	REV 03	710-009184		SIB-M-S
SIB 2	REV 03	710-009184		SIB-M-S
SIB 3	REV 03	710-009184		SIB-M-S
Fan Tray 0				FFANTRAY-M320-S
Fan Tray 1				FFANTRAY-M320-S
Fan Tray 2				RFANTRAY-M320-S

## show chassis hardware (MX5 Router)

user@host&gt; show chassis hardware

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			E1368	MX5-T
Midplane	REV 01	711-038215	YF5288	MX5-T
PEM 0	Rev 04	740-028288	VA01215	AC Power Entry Module
PEM 1	Rev 04	740-028288	VA01218	AC Power Entry Module
Routing Engine		BUILTIN	BUILTIN	Routing Engine
TFEB 0		BUILTIN	BUILTIN	Forwarding Engine
Processor				
QXM 0	REV 05	711-028408	ZA9136	MPC QXM
FPC 0		BUILTIN	BUILTIN	MPC BUILTIN
MIC 0		BUILTIN	BUILTIN	4x 10GE XFP
PIC 0		BUILTIN	BUILTIN	4x 10GE XFP
FPC 1		BUILTIN	BUILTIN	MPC BUILTIN
MIC 0	REV 24	750-028392	YX9820	3D 20x 1GE(LAN) SFP
PIC 0		BUILTIN	BUILTIN	10x 1GE(LAN) SFP
Xcvr 0	REV 01	740-031851	AM1045SUAQ3	SFP-SX
Xcvr 1	REV 01	740-031851	AM1045SUAPA	SFP-SX
Xcvr 2	REV 01	740-031851	AM1045SUAN7	SFP-SX
Xcvr 3	REV 01	740-031851	AM1045SU91Q	SFP-SX
Xcvr 4	REV 01	740-031851	AM1045SUDDR	SFP-SX
Xcvr 9	REV 01	740-011613	AM0848SB6A1	SFP-SX
PIC 1		BUILTIN	BUILTIN	10x 1GE(LAN) SFP
Xcvr 0	REV 01	740-031851	AM1045SUANO	SFP-SX
Xcvr 1	REV 01	740-011613	AS0812S0719	SFP-SX
Xcvr 2	REV 01	740-011613	AM0821SA121	SFP-SX
Xcvr 3	REV 01	740-011613	PF21K21	SFP-SX
Xcvr 4	REV 01	740-011613	AM0848SB69Z	SFP-SX
Xcvr 5	REV 01	740-011782	P9P0XV3	SFP-SX
Xcvr 6	REV 01	740-011613	AM0812S8WJN	SFP-SX
Xcvr 7	REV 01	740-011613	PAM3G9Q	SFP-SX
Xcvr 8	REV 01	740-011613	AM0848SB4A6	SFP-SX
Xcvr 9	REV 01	740-011782	P9M0U37	SFP-SX
MIC 1	REV 20	750-028380	ZG2657	3D 2x 10GE XFP
PIC 2		BUILTIN	BUILTIN	1x 10GE XFP
PIC 3		BUILTIN	BUILTIN	1x 10GE XFP
Fan Tray				Fan Tray

## show chassis hardware (MX10 Router)

user@host&gt; show chassis hardware

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			E1372	MX10-T
Midplane	REV 01	711-038211	YF5285	MX10-T
PEM 0	Rev 04	740-028288	VB01678	AC Power Entry Module
Routing Engine		BUILTIN	BUILTIN	Routing Engine
TFEB 0		BUILTIN	BUILTIN	Forwarding Engine
Processor				
QXM 0	REV 05	711-028408	ZA9053	MPC QXM
FPC 0		BUILTIN	BUILTIN	MPC BUILTIN
MIC 0		BUILTIN	BUILTIN	4x 10GE XFP
PIC 0		BUILTIN	BUILTIN	4x 10GE XFP
FPC 1		BUILTIN	BUILTIN	MPC BUILTIN
MIC 0	REV 24	750-028392	YX9436	3D 20x 1GE(LAN) SFP

PIC 0			BUILTIN	BUILTIN	10x 1GE(LAN) SFP
Xcvr 0	REV 01	740-031851	AM1107SUFQW		SFP-SX
PIC 1		BUILTIN	BUILTIN		10x 1GE(LAN) SFP
Fan Tray					Fan Tray

### show chassis hardware (MX40 Router)

```
user@host> show chassis hardware
```

Hardware inventory:				
Item	Version	Part number	Serial number	Description
Chassis			E1367	MX40-T
Midplane	REV 01	711-038211	YF5284	MX40-T
PEM 0	Rev 04	740-028288	VB01680	AC Power Entry Module
PEM 1	Rev 04	740-028288	VB01700	AC Power Entry Module
Routing Engine		BUILTIN	BUILTIN	Routing Engine
TFEB 0		BUILTIN	BUILTIN	Forwarding Engine
Processor				
QXM 0	REV 05	711-028408	ZA9048	MPC QXM
FPC 0		BUILTIN	BUILTIN	MPC BUILTIN
MIC 0		BUILTIN	BUILTIN	4x 10GE XFP
PIC 0		BUILTIN	BUILTIN	4x 10GE XFP
Xcvr 0	REV 01	740-014279	M7067UPP	XFP-10G-LR
Xcvr 1		NON-JNPR	K9J02UN	XFP-10G-LR
FPC 1		BUILTIN	BUILTIN	MPC BUILTIN
MIC 0	REV 24	750-028392	YX3504	3D 20x 1GE(LAN) SFP
PIC 0		BUILTIN	BUILTIN	10x 1GE(LAN) SFP
Xcvr 0	REV 01	740-011613	AM0812S8WTE	SFP-SX
Xcvr 1	REV 01	740-011613	PFA6KV2	SFP-SX
Xcvr 2	REV 01	740-031851	AM1045SUDDM	SFP-SX
Xcvr 3	REV 01	740-011613	PD63C7M	SFP-SX
Xcvr 4	REV 01	740-011613	PD63DJY	SFP-SX
Xcvr 5	REV 02	740-011613	AA0950STLL9	SFP-SX
Xcvr 6	REV 01	740-011782	PAR1YHC	SFP-SX
Xcvr 7	REV 01	740-011782	P9P0XXL	SFP-SX
Xcvr 8	REV 01	740-011613	PD63D95	SFP-SX
Xcvr 9	REV 01	740-031851	AM1045SU9B8	SFP-SX
PIC 1		BUILTIN	BUILTIN	10x 1GE(LAN) SFP
Xcvr 0	REV 01	740-011613	PF21L3Z	SFP-SX
Xcvr 1	REV 01	740-031851	AM1045SU7M9	SFP-SX
Xcvr 2	REV 01	740-031851	AM1045SUAPT	SFP-SX
Xcvr 3	REV 01	740-011613	PFF2BZH	SFP-SX
Xcvr 4	REV 01	740-031851	AM1045SUDDN	SFP-SX
Xcvr 5	REV 01	740-031851	AM1039S00ZR	SFP-SX
Xcvr 6	REV 01	740-031851	AM1045SUD6Y	SFP-SX
Xcvr 8	REV 01	740-011613	PFM1QBS	SFP-SX
Xcvr 9	REV 01	740-011613	PFF2E25	SFP-SX
MIC 1	REV 01	750-021130	KG4391	3D 2x 10GE XFP
PIC 2		BUILTIN	BUILTIN	1x 10GE XFP
Xcvr 0	REV 01	740-011571	C645XJ04G	XFP-10G-SR
PIC 3		BUILTIN	BUILTIN	1x 10GE XFP
Xcvr 0		NON-JNPR	CA49BK0AE	XFP-10G-SR
Fan Tray				Fan Tray

### show chassis hardware (Fixed MX80 Router)

```
user@host> show chassis hardware
```

Hardware inventory:				
Item	Version	Part number	Serial number	Description
Chassis				MX80-48T
Midplane	REV 01	711-031603	KF9250	MX80-48T
Routing Engine		BUILTIN	BUILTIN	Routing Engine
FEB 0		BUILTIN	BUILTIN	Forwarding Engine Board
FPC 0		BUILTIN	BUILTIN	MPC BUILTIN
MIC 0		BUILTIN	BUILTIN	4x 10GE XFP
PIC 0		BUILTIN	BUILTIN	4x 10GE XFP
Xcvr 0		NON-JNPR	M6439D41	XFP-10G-LR
Xcvr 1	REV 01	740-014279	6XE931N00202	XFP-10G-LR
Xcvr 2	REV 01	740-014289	C715XU05F	XFP-10G-SR
Xcvr 3	REV 01	740-014289	C650XU0EP	XFP-10G-SR
FPC 1		BUILTIN	BUILTIN	MPC BUILTIN
MIC 0	REV 01	711-029399	JR6981	12x 1GE(LAN) RJ45
PIC 0		BUILTIN	BUILTIN	12x 1GE(LAN) RJ45
PIC 1		BUILTIN	BUILTIN	12x 1GE(LAN) RJ45
MIC 1	REV 01	BUILTIN	BUILTIN	12x 1GE(LAN) RJ45
PIC 2		BUILTIN	BUILTIN	12x 1GE(LAN) RJ45
PIC 3		BUILTIN	BUILTIN	12x 1GE(LAN) RJ45
Fan Tray				Fan Tray

### show chassis hardware (Modular MX80 Router)

```
user@host> show chassis hardware
```

Hardware inventory:				
Item	Version	Part number	Serial number	Description
Chassis				MX80
Midplane	REV 02	711-031594	JR7084	MX80
PEM 0	Rev 01	740-028288	000018	AC Power Entry Module
Routing Engine		BUILTIN	BUILTIN	Routing Engine
FEB 0		BUILTIN	BUILTIN	Forwarding Engine Board
QXM 0	REV 05	711-028408	JR7041	MPC QXM
FPC 0		BUILTIN	BUILTIN	MPC BUILTIN
MIC 0		BUILTIN	BUILTIN	4x 10GE XFP
PIC 0		BUILTIN	BUILTIN	4x 10GE XFP
FPC 1		BUILTIN	BUILTIN	MPC BUILTIN
MIC 0	REV 02	750-028380	JR6598	3D 2x 10GE XFP
PIC 0		BUILTIN	BUILTIN	1x 10GE XFP
Xcvr 0	REV 01	740-014289	T07M86365	XFP-10G-SR
PIC 1		BUILTIN	BUILTIN	1x 10GE XFP
Xcvr 0	REV 01	740-014289	T07M71094	XFP-10G-SR
MIC 1	REV 02	750-028380	JG8548	3D 2x 10GE XFP
PIC 2		BUILTIN	BUILTIN	1x 10GE XFP
Xcvr 0	REV 02	740-014289	T08L86302	XFP-10G-SR
PIC 3		BUILTIN	BUILTIN	1x 10GE XFP
Xcvr 0	REV 02	740-014289	C810XU0BA	XFP-10G-SR
Fan Tray				Fan Tray

### show chassis hardware (MX150)

```
user@host> show chassis hardware
```

Hardware inventory:				
Item	Version	Part number	Serial number	Description
Chassis			DD2316AF0078	MX150

Midplane	REV 04	650-066113	DD2316AF0078	MX150
Power Supply 0				
Routing Engine 0				RE-VMX
CB 0				VMX SCB
CB 1				VMX SCB
FPC 0				Virtual FPC
CPU	Rev. 1.0	RIOT	BUILTIN	
MIC 0				Virtual
PIC 0		BUILTIN	BUILTIN	Virtual
Xcvr 10	REV 02	740-013111	A331846	SFP-T
Xcvr 11	REV 02	740-013111	C248517	SFP-T
Fan Tray 0				fan-ctrl-0 0, Front to
Back Airflow - AFO				
Fan Tray 1				fan-ctrl-0 1, Front to
Back Airflow - AFO				

### show chassis hardware models (MX150)

```
user@host> show chassis hardware models
```

Hardware inventory:				
Item	Version	Part number	Serial number	FRU model number
Midplane	REV 04	650-066113	DD2316AF0163	MX150
Fan Tray 0				Assy,Sub,Fan
Tray,AFO,Opus-AFO				
Fan Tray 1				Assy,Sub,Fan
Tray,AFO,Opus-AFO				

### show chassis hardware (MX104 Router)

```
user@host> show chassis hardware
```

Hardware inventory:				
Item	Version	Part number	Serial number	Description
Chassis			G3503	MX104
Midplane	REV 28	750-044219	CAAX5741	MX104
PEM 0	REV 03	740-045933	1H072500016	AC Power Entry Module
PEM 1	REV 03	740-045932	1H073050017	DC Power Entry Module
Routing Engine 0	REV 20	750-044228	CAAY7935	RE-MX-104
Routing Engine 1	REV 13	750-044228	CAAM6380	RE-MX-104
AFEB 0		BUILTIN	BUILTIN	Forwarding Engine
Processor				
FPC 0		BUILTIN	BUILTIN	MPC BUILTIN
FPC 1		BUILTIN	BUILTIN	MPC BUILTIN
MIC 0	REV 15	750-036132	CAAF7948	2x0C12/8x0C3 CC-CE
PIC 0		BUILTIN	BUILTIN	2x0C12/8x0C3 CC-CE
Xcvr 0	REV 01	740-011615	PCQ0U2J	SFP-IR
Xcvr 1	REV 01	740-016068	PJL7A6G	SFP-SR
Xcvr 2	REV 01	740-016068	PJL7A5J	SFP-SR
Xcvr 3	REV 01	740-016065	PJN5HPZ	SFP-SR
Xcvr 4	REV 01	740-029122	PKB38TL	SFP-LR
Xcvr 5	REV 01	740-011787	P6A107G	SFP-LR
Xcvr 6	REV 01	740-029122	PKB38TR	SFP-LR
Xcvr 7	REV 01	740-011787	PBKONK3	SFP-LR
MIC 1				
FPC 2		BUILTIN	BUILTIN	MPC BUILTIN
MIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	B10F00465	SFP+-10G-SR

Xcvr 1	REV 01	740-031980	B10F00461	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B10G01545	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B10G01385	SFP+-10G-SR
Fan Tray 0	REV 02	711-049570	CAAX6538	Fan Tray

**show chassis hardware detail (MX104 Router)**

```
user@host> show chassis hardware detail
```

**Hardware inventory:**

Item	Version	Part number	Serial number	Description
Chassis			G3503	MX104
Midplane	REV 28	750-044219	CAAX5741	MX104
PEM 0	REV 03	740-045933	1H072500016	AC Power Entry Module
PEM 1	REV 03	740-045932	1H073050017	DC Power Entry Module
Routing Engine 0	REV 20	750-044228	CAAY7935	RE-MX-104
da0 7836 MB	ATP IG	eUSB SSD		Nand Flash 0
usb0 (addr 1)	EHCI root hub 0		Freescall	uhub0
usb0 (addr 2)	USB2513Bi	9491	SMSC	uhub1
usb0 (addr 3)	ATP IG	eUSB SSD 44801	ATP Electronics	umass0
Routing Engine 1	REV 13	750-044228	CAAM6380	RE-MX-104
da0 7836 MB	ATP IG	eUSB SSD		Nand Flash 0
AFEB 0		BUILTIN	BUILTIN	Forwarding Engine
Processor				
FPC 0		BUILTIN	BUILTIN	MPC BUILTIN
FPC 1		BUILTIN	BUILTIN	MPC BUILTIN
MIC 0	REV 15	750-036132	CAAF7948	2xOC12/8xOC3 CC-CE
PIC 0		BUILTIN	BUILTIN	2xOC12/8xOC3 CC-CE
Xcvr 0	REV 01	740-011615	PCQ0U2J	SFP-IR
Xcvr 1	REV 01	740-016068	PJL7A6G	SFP-SR
Xcvr 2	REV 01	740-016068	PJL7A5J	SFP-SR
Xcvr 3	REV 01	740-016065	PJN5HPZ	SFP-SR
Xcvr 4	REV 01	740-029122	PKB38TL	SFP-LR
Xcvr 5	REV 01	740-011787	P6A107G	SFP-LR
Xcvr 6	REV 01	740-029122	PKB38TR	SFP-LR
Xcvr 7	REV 01	740-011787	PBKONK3	SFP-LR
MIC 1				
FPC 2		BUILTIN	BUILTIN	MPC BUILTIN
MIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	B10F00465	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B10F00461	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B10G01545	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B10G01385	SFP+-10G-SR
Fan Tray 0	REV 02	711-049570	CAAX6538	Fan Tray

**show chassis hardware detail (MX480 Packet Transport Router with details of virtual disk size)**

```
user@host> show chassis hardware detail
```

**Hardware inventory:**

Item	Version	Part number	Serial number	Description
Chassis			JN122FFD9AFB	MX480
Midplane	REV 05	710-017414	ACRB8882	MX480 Midplane
FPM Board	REV 02	710-017254	CADF7623	Front Panel Display
PEM 0	Rev 07	740-017343	QCS1128A0TY	DC Power Entry Module
PEM 1	Rev 07	740-017343	QCS1128A0JM	DC Power Entry Module
Routing Engine 0	REV 07	750-054758	CADG2028	RE-S-2X00x6
vtbd0 15361 MB				Virtio Block Disk

```

vtbd1 15360 MB
ada0 511 MB QEMU HARDDISK QM00002 Virtio Block Disk
usb0 (addr 1) UHCI root HUB 0 Intel Emulated IDE Disk
Routing Engine 1 REV 00 750-054758 uhub0
vtbd0 15361 MB RE-S-2X00x6
vtbd1 15360 MB Virtio Block Disk
ada0 511 MB QEMU HARDDISK QM00002 Virtio Block Disk
usb0 (addr 1) UHCI root HUB 0 Intel Emulated IDE Disk
CB 0 REV 01 750-055976 CACS1837 uhub0
CB 1 REV 01 750-055976 CADD9894 Enhanced MX SCB 2
Xcvr 1 REV 01 740-031980 AP41KCL Enhanced MX SCB 2
FPC 0 REV 09 750-049040 CACX1759 SFP+-10G-SR
CPU REV 10 711-035209 CACP9324 LOAD MPC Type 2
FPC 4 REV 28 750-037355 CACY8384 HMPD PMB 2G
CPU REV 10 711-035209 CACX0428 MPC4E 3D 2CGE+8XGE
Fan Tray HMPD PMB 2G
Enhanced Left Fan Tray

```

### show chassis hardware extensive (MX104 Router)

```
user@host> show chassis hardware extensive
```

#### Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			G3503	MX104

JeDEC Code: 0x7fb0 EEPROM Version: 0x02

S/N: G3503

Assembly ID: 0x0560 Assembly Version: 00.00

Date: 00-00-0000 Assembly Flags: 0x00

ID: MX104

#### Board Information Record:

Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

#### I2C Hex Data:

Address 0x00: 7f b0 02 ff 05 60 00 00 00 00 00 00 00 00 00 00

Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Address 0x20: 47 33 35 30 33 00 00 00 00 00 00 00 00 00 00 00

Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Midplane	REV 28	750-044219	CAAX5741	MX104
JeDEC Code:	0x7fb0	EEPROM Version:	0x02	
P/N:	750-044219	S/N:	CAAX5741	
Assembly ID:	0x0560	Assembly Version:	01.28	
Date:	03-27-2013	Assembly Flags:	0x00	
Version:	REV 28	CLEI Code:	PROTOXCLEI	
ID:	MX104	FRU Model Number:	PROTO-ASSEMBLY	

JeDEC Code: 0x7fb0 EEPROM Version: 0x02

P/N: 750-044219 S/N: CAAX5741

Assembly ID: 0x0560 Assembly Version: 01.28

Date: 03-27-2013 Assembly Flags: 0x00

Version: REV 28 CLEI Code: PROTOXCLEI

ID: MX104 FRU Model Number: PROTO-ASSEMBLY

#### Board Information Record:

Address 0x00: ad 01 08 00 b0 a8 6e a7 f8 00 ff ff ff ff ff ff

#### I2C Hex Data:

Address 0x00: 7f b0 02 ff 05 60 01 1c 52 45 56 20 32 38 00 00

Address 0x10: 00 00 00 00 37 35 30 2d 30 34 34 32 31 39 00 00

Address 0x20: 53 2f 4e 20 43 41 41 58 35 37 34 31 00 1b 03 07

Address 0x30: dd ff ff ff ad 01 08 00 b0 a8 6e a7 f8 00 ff ff

Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50

Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00

Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff

Address 0x70: ff ff ff c2 47 33 35 30 33 00 00 00 00 00 00 00

PEM 0	REV 03	740-045933	1H072500016	AC Power Entry Module
JeDEC Code:	0x7fb0	EEPROM Version:	0x02	

JeDEC Code: 0x7fb0 EEPROM Version: 0x02

```

P/N:          740-045933      S/N:          1H072500016
Assembly ID:  0x0475         Assembly Version: 00.03
Date:         12-14-2012     Assembly Flags:  0x00
Version:      REV 03         CLEI Code:       IPUPAJ9KAA
ID: AC Power Entry Module    FRU Model Number: PWR-AMX1100-AC-S
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff 02 02 00 ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 75 00 03 52 45 56 20 30 33 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 39 33 33 00 00
  Address 0x20: 31 48 30 37 32 35 30 30 30 31 36 00 00 0e 0c 07
  Address 0x30: dc 30 43 ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: 02 02 00 ff 01 49 50 55 50 41 4a 39 4b 41 41 50
  Address 0x50: 57 52 2d 41 4d 58 31 31 30 30 2d 41 43 2d 53 00
  Address 0x60: 00 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff
  Address 0x70: ff ff ff 70 ff ff ff ff ff ff ff ff ff ff ff ff
PEM 1          REV 03      740-045932      1H073050017      DC Power Entry Module
Jedec Code:    0x7fb0      EEPROM Version: 0x02
P/N:          740-045932      S/N:          1H073050017
Assembly ID:  0x0476         Assembly Version: 00.03
Date:         01-30-2013     Assembly Flags:  0x00
Version:      REV 03         CLEI Code:       IPUPAJ8KAA
ID: DC Power Entry Module    FRU Model Number: PWR-AMX1100-DC-S
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff 02 02 00 ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 76 00 03 52 45 56 20 30 33 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 39 33 32 00 00
  Address 0x20: 31 48 30 37 33 30 35 30 30 31 37 00 00 1e 01 07
  Address 0x30: dd 30 44 ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: 02 02 00 ff 01 49 50 55 50 41 4a 38 4b 41 41 50
  Address 0x50: 57 52 2d 41 4d 58 31 31 30 30 2d 44 43 2d 53 00
  Address 0x60: 00 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff
  Address 0x70: ff ff ff 72 ff ff ff ff ff ff ff ff ff ff ff ff
Routing Engine 0 REV 20      750-044228      CAAY7935      RE-MX-104
Jedec Code:    0x7fb0      EEPROM Version: 0x02
P/N:          750-044228      S/N:          CAAY7935
Assembly ID:  0x0b81         Assembly Version: 01.20
Date:         03-18-2013     Assembly Flags:  0x00
Version:      REV 20         CLEI Code:       PROTOXCLEI
ID: RE-MX-104              FRU Model Number: PROTO-ASSEMBLY
Board Information Record:
  Address 0x00: ad 01 00 08 b0 a8 6e a6 fc 10 ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 fe 0b 81 01 14 52 45 56 20 32 30 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 34 34 32 32 38 00 00
  Address 0x20: 53 2f 4e 20 43 41 41 59 37 39 33 35 00 12 03 07
  Address 0x30: dd ff ff ff ad 01 00 08 b0 a8 6e a6 fc 10 ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
  Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff
  Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff
da0      7836 MB  ATP IG eUSB SSD                      Nand Flash 0
usb0 (addr 1) EHCI root hub 0      Freescale      uhub0
usb0 (addr 2) USB2513Bi 9491        SMSC          uhub1
usb0 (addr 3) ATP IG eUSB SSD 44801 ATP Electronics  umass0
Routing Engine 1 REV 13      750-044228      CAAM6380      RE-MX-104
Jedec Code:    0x7fb0      EEPROM Version: 0x02
P/N:          750-044228      S/N:          CAAM6380
Assembly ID:  0x0b81         Assembly Version: 01.13

```



```

Date:          09-17-2012      Assembly Flags:  0x00
Version:       REV 13         CLEI Code:      PROTOXCLEI
ID: RE-MX-104      FRU Model Number:  PROTO-ASSEMBLY

Board Information Record:
  Address 0x00: ad 01 00 08 64 87 88 27 08 18 ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 fe 0b 81 01 0d 52 45 56 20 31 33 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 34 34 32 32 38 00 00
  Address 0x20: 53 2f 4e 20 43 41 41 4d 36 33 38 30 00 11 09 07
  Address 0x30: dc ff ff ff ad 01 00 08 64 87 88 27 08 18 ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
  Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff
da0      7836 MB  ATP IG eUSB SSD      Nand Flash 0
AFEB 0              BUILTIN          BUILTIN          Forwarding Engine
Processor
FPC 0              BUILTIN          BUILTIN          MPC BUILTIN
FPC 1              BUILTIN          BUILTIN          MPC BUILTIN
  MIC 0            REV 15      750-036132  CAAF7948      2x0C12/8x0C3 CC-CE
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N:      750-036132      S/N:      CAAF7948
Assembly ID: 0x0a1a      Assembly Version: 01.15
Date:      07-03-2012      Assembly Flags: 0x00
Version:    REV 15         CLEI Code:      IP9IAM2DAA
ID: 2x0C12/8x0C3 CC-CE    FRU Model Number: MIC-3D-80C3-20C12-ATM

Board Information Record:
  Address 0x00: 12 01 05 03 05 ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0a 1a 01 0f 52 45 56 20 31 35 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 33 36 31 33 32 00 00
  Address 0x20: 53 2f 4e 20 43 41 41 46 37 39 34 38 00 03 07 07
  Address 0x30: dc ff ff ff 12 01 05 03 05 ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 39 49 41 4d 32 44 41 41 4d
  Address 0x50: 49 43 2d 33 44 2d 38 4f 43 33 2d 32 4f 43 31 32
  Address 0x60: 2d 41 54 4d 00 00 41 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff e3 c0 02 a3 9c 00 00 00 00 0a 60 00 00
  PIC 0              BUILTIN          BUILTIN          2x0C12/8x0C3 CC-CE
    Xcvr 0            REV 01      740-011615  PCQ0U2J      SFP-IR
    Xcvr 1            REV 01      740-016068  PjL7A6G      SFP-SR
    Xcvr 2            REV 01      740-016068  PjL7A5J      SFP-SR
    Xcvr 3            REV 01      740-016065  PjN5HPZ      SFP-SR
    Xcvr 4            REV 01      740-029122  PKB38TL      SFP-LR
    Xcvr 5            REV 01      740-011787  P6A107G      SFP-LR
    Xcvr 6            REV 01      740-029122  PKB38TR      SFP-LR
    Xcvr 7            REV 01      740-011787  PBKONK3      SFP-LR
  MIC 1
FPC 2              BUILTIN          BUILTIN          MPC BUILTIN
  MIC 0              BUILTIN          BUILTIN          4x 10GE(LAN) SFP+
Jedec Code: 0x0000      EEPROM Version: 0x00
P/N:      BUILTIN          S/N:      BUILTIN
Assembly ID: 0x0a60      Assembly Version: 00.00
Date:      00-00-0000      Assembly Flags: 0x00
ID: 4x 10GE(LAN) SFP+

Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
  Address 0x00: 00 00 00 00 0a 60 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 4d 58 43 00
  Address 0x20: 42 55 49 4c 54 49 4e 00 4d 58 43 00 00 00 00 00

```

```

Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 c0 02 a5 04 7f b0 02 ff 0a 1a 01 0f
PIC 0          BUILTIN          BUILTIN          4x 10GE(LAN) SFP+
Xcvr 0        REV 01          740-031980          B10F00465          SFP+-10G-SR
Xcvr 1        REV 01          740-031980          B10F00461          SFP+-10G-SR
Xcvr 2        REV 01          740-031980          B10G01545          SFP+-10G-SR
Xcvr 3        REV 01          740-031980          B10G01385          SFP+-10G-SR
Fan Tray 0    REV 02          711-049570          CAAX6538          Fan Tray
Jedec Code:   0x7fb0          EEPROM Version: 0x02
P/N:          711-049570      S/N:          CAAX6538
Assembly ID:  0x0b82          Assembly Version: 01.02
Date:         03-01-2013      Assembly Flags: 0x00
Version:      REV 02          CLEI Code:     PROTOXCLEI
ID: Fan Tray          FRU Model Number: PROTO-ASSEMBLY
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 82 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 34 39 35 37 30 00 00
Address 0x20: 53 2f 4e 20 43 41 41 58 36 35 33 38 00 01 03 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff
Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff

```

### show chassis hardware extensive (PTX10008 Router)

```
user@host> show chassis hardware extensive
```

```

Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis
PILOT BUILD V1.1]
Jedec Code:   0x7fb0          EEPROM Version: 0x02
S/N:          DE487
Assembly ID:  0x0566          Assembly Version: 01.27
Date:         08-08-2016      Assembly Flags: 0x00
CLEI Code:    CMMUM00ARA
ID: JNP10008          FRU Model Number: QFX10008-CHAS
Board Information Record:
Address 0x00: ad 01 08 00 30 b6 4f e9 74 c4 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 05 66 01 1b 00 45 56 20 32 37 00 00
Address 0x10: 00 00 00 00 00 35 30 2d 30 35 34 30 39 37 00 00
Address 0x20: 44 45 34 38 37 00 00 00 00 00 00 00 00 08 08 07
Address 0x30: e0 ff ff ff ad 01 08 00 30 b6 4f e9 74 c4 ff ff
Address 0x40: ff ff ff ff 01 43 4d 4d 55 4d 30 30 41 52 41 51
Address 0x50: 46 58 31 30 30 30 38 2d 43 48 41 53 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 41 44 00 ff ff ff ff ff ff
Address 0x70: ff ff ff 63 44 45 34 38 37 00 00 00 00 00 00 00
Midplane      REV 27          750-054097          ACPD4307          Midplane 8
Jedec Code:   0x7fb0          EEPROM Version: 0x02
P/N:          750-054097      S/N:          ACPD4307
Assembly ID:  0x0be3          Assembly Version: 01.27
Date:         08-08-2016      Assembly Flags: 0x00
Version:      REV 27          CLEI Code:    CMMUM00ARA

```

```

ID: QFX10008 Midplane          FRU Model Number: QFX10008-CHAS
Board Information Record:
Address 0x00: ad 01 08 00 30 b6 4f e9 74 c4 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b e3 01 1b 52 45 56 20 32 37 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 34 30 39 37 00 00
Address 0x20: 53 2f 4e 20 41 43 50 44 34 33 30 37 00 08 08 07
Address 0x30: e0 ff ff ff ad 01 08 00 30 b6 4f e9 74 c4 ff ff
Address 0x40: ff ff ff ff 01 43 4d 4d 55 4d 30 30 41 52 41 51
Address 0x50: 46 58 31 30 30 30 38 2d 43 48 41 53 00 00 00 00
Address 0x60: 00 00 00 00 00 00 41 44 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 63 44 45 34 38 37 00 00 00 00 00 00 00
Routing Engine 0          BUILTIN          BUILTIN          RE-PTX-2X00x4
vtbd0 15360 MB          Virtio Block Disk
vtbd1 15360 MB          Virtio Block Disk
ada0 128 MB QEMU          QM00002          Virtio Block Disk
usb0 (addr 0.1) EHCI root HUB 0          Intel          uhub0
usb1 (addr 0.2) product 0x0020 32          vendor 0x8087          uhub1
Routing Engine 1          BUILTIN          BUILTIN          RE-PTX-2X00x4
vtbd0 15360 MB          Virtio Block Disk
vtbd1 15360 MB          Virtio Block Disk
ada0 128 MB QEMU          QM00002          Virtio Block Disk
usb0 (addr 0.1) EHCI root HUB 0          Intel          uhub0
usb1 (addr 0.2) product 0x0020 32          vendor 0x8087          uhub1
CB 0          REV 02          750-068820          ACNZ4440          Control Board
Jedec Code: 0x7fb0          EEPROM Version: 0x02
P/N: 750-068820          S/N: ACNZ4440
Assembly ID: 0x0b9d          Assembly Version: 01.02
Date: 06-13-2016          Assembly Flags: 0x00
Version: REV 02          CLEI Code: CMUCAH3CTB
ID: Control Board          FRU Model Number: QFX10000-RE
Board Information Record:
Address 0x00: ad 01 00 10 84 c1 c1 54 10 be ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 9d 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 36 38 38 32 30 00 00
Address 0x20: 53 2f 4e 20 41 43 4e 5a 34 34 34 30 00 0d 06 07
Address 0x30: e0 ff ff ff ad 01 00 10 84 c1 c1 54 10 be ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 33 43 54 42 51
Address 0x50: 46 58 31 30 30 30 30 2d 52 45 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 42 41 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff db ff ff ff ff ff ff ff ff ff ff ff ff
CB 1          REV 02          750-068820          ACNZ8284          Control Board
Jedec Code: 0x7fb0          EEPROM Version: 0x02
P/N: 750-068820          S/N: ACNZ8284
Assembly ID: 0x0b9d          Assembly Version: 01.02
Date: 06-27-2016          Assembly Flags: 0x00
Version: REV 02          CLEI Code: CMUCAH3CTB
ID: Control Board          FRU Model Number: QFX10000-RE
Board Information Record:
Address 0x00: ad 01 00 10 84 c1 c1 e5 b1 46 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 9d 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 36 38 38 32 30 00 00
Address 0x20: 53 2f 4e 20 41 43 4e 5a 38 32 38 34 00 1b 06 07
Address 0x30: e0 ff ff ff ad 01 00 10 84 c1 c1 e5 b1 46 ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 33 43 54 42 51
Address 0x50: 46 58 31 30 30 30 30 2d 52 45 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 42 41 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff db ff ff ff ff ff ff ff ff ff ff ff ff

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FPC 0          REV 36   750-051354   ACNP4679          LC1102 - 12C / 36Q /
144X
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-051354      S/N:             ACNP4679
Assembly ID:   0x0be7          Assembly Version: 01.36
Date:          11-11-2016      Assembly Flags:   0x00
Version:       REV 36          CLEI Code:        CMUIAM9BAA
ID: ULC-36Q-12Q28             FRU Model Number: QFX10000-36Q
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b e7 01 24 52 45 56 20 33 36 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 35 31 33 35 34 00 00
  Address 0x20: 53 2f 4e 20 41 43 4e 50 34 36 37 39 00 0b 0b 07
  Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 43 4d 55 49 41 4d 39 42 41 41 51
  Address 0x50: 46 58 31 30 30 30 30 2d 33 36 51 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 42 45 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff fe ff ff ff ff ff ff ff ff ff ff ff ff
CPU          BUILTIN          BUILTIN          FPC CPU
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           BUILTIN          S/N:             BUILTIN
Assembly ID:   0xf020          Assembly Version: 02.17
Date:          04-19-2012      Assembly Flags:   0x00
Board Information Record:
  Address 0x00: ad 01 01 04 ac 4b c8 1d f7 b6 ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff f0 20 02 11 00 e0 3c fa 09 00 70 87
  Address 0x10: 09 38 bb ff 42 55 49 4c 54 49 4e 00 00 e0 3c fa
  Address 0x20: 42 55 49 4c 54 49 4e 00 42 55 49 4c 00 13 04 07
  Address 0x30: dc ff ff ff ad 01 01 04 ac 4b c8 1d f7 b6 ff ff
  Address 0x40: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 45 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff f3 50 36 36 36 36 00 00 00 00 00 00 00
PIC 0          BUILTIN          BUILTIN          12x100GE/36x40GE/144x10GE

Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           BUILTIN          S/N:             BUILTIN
Assembly ID:   0xf050          Assembly Version: 02.17
Date:          04-19-2012      Assembly Flags:   0x00
Board Information Record:
  Address 0x00: ad 01 01 04 ac 4b c8 1d f7 b6 ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff f0 50 02 11 00 00 00 00 07 0a 20 45
  Address 0x10: 6c 61 70 73 42 55 49 4c 54 49 4e 00 25 73 3a 20
  Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 13 04 07
  Address 0x30: dc ff ff ff ad 01 01 04 ac 4b c8 1d f7 b6 ff ff
  Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 45 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff f3 55 55 55 55 55 55 55 55 55 55 55 55
Xcvr 1        REV 01   740-058734   1ECQ113834D       QSFP-100GBASE-SR4
Xcvr 5        REV 01   740-058734   1ECQ1137067       QSFP-100GBASE-SR4
Xcvr 6        REV 01   740-054053   QF3205SD          QSFP+-4X10G-SR
Xcvr 7        REV 01   740-058734   1ECQ11381MP       QSFP-100GBASE-SR4
Xcvr 11       REV 01   740-061405   1ACQ110507K       QSFP-100GBASE-SR4
Xcvr 13       REV 01   740-058734   1ECQ11390ZB       QSFP-100GBASE-SR4
Xcvr 17       REV 01   740-058734   1ECQ11381M1       QSFP-100GBASE-SR4
Xcvr 19       REV 01   740-058734   1ECQ11381JS       QSFP-100GBASE-SR4

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Xcvr 23      REV 01    740-058734    1ACQ112000E    QSFP-100GBASE-SR4
Xcvr 25      REV 01    740-058734    1ECQ11381NT    QSFP-100GBASE-SR4
Xcvr 28      REV 01    740-054053    QG1502WV       QSFP+-4X10G-SR
Xcvr 29      REV 01    740-058734    1ACQ112000D    QSFP-100GBASE-SR4
Xcvr 33      REV 01    740-058734    1ACQ1134065    QSFP-100GBASE-SR4
Xcvr 34      REV 01    740-067442    XV20L4L        QSFP+-40G-SR4
FPC 1        REV 33    750-051354    ACNX8831        LC1102 - 12C / 36Q /
144X
Jedec Code:  0x7fb0      EEPROM Version: 0x02
P/N:          750-051354  S/N:           ACNX8831
Assembly ID:  0x0be7     Assembly Version: 01.33
Date:         06-03-2016  Assembly Flags:  0x00
Version:      REV 33     CLEI Code:      CMUIAM9BAA
ID: ULC-36Q-12Q28       FRU Model Number: QFX10000-36Q

Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b e7 01 21 52 45 56 20 33 33 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 31 33 35 34 00 00
Address 0x20: 53 2f 4e 20 41 43 4e 58 38 38 33 31 00 03 06 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 49 41 4d 39 42 41 41 51
Address 0x50: 46 58 31 30 30 30 30 2d 33 36 51 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 42 42 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff fb ff ff ff ff ff ff ff ff ff ff ff ff
CPU          BUILTIN    BUILTIN    FPC CPU
Jedec Code:  0x7fb0      EEPROM Version: 0x02
P/N:          BUILTIN    S/N:           BUILTIN
Assembly ID:  0xf020     Assembly Version: 02.17
Date:         04-19-2012  Assembly Flags:  0x00
Board Information Record:
Address 0x00: ad 01 01 04 ac 4b c8 1d f7 b6 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff f0 20 02 11 00 20 3e fa 09 00 10 8a
Address 0x10: 09 38 bb ff 42 55 49 4c 54 49 4e 00 00 20 3e fa
Address 0x20: 42 55 49 4c 54 49 4e 00 42 55 49 4c 00 13 04 07
Address 0x30: dc ff ff ff ad 01 01 04 ac 4b c8 1d f7 b6 ff ff
Address 0x40: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 45 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff f3 50 36 36 36 36 00 00 00 00 00 00 00
PIC 0        BUILTIN    BUILTIN    12x100GE/36x40GE/144x10GE

Jedec Code:  0x7fb0      EEPROM Version: 0x02
P/N:          BUILTIN    S/N:           BUILTIN
Assembly ID:  0xf050     Assembly Version: 02.17
Date:         04-19-2012  Assembly Flags:  0x00
Board Information Record:
Address 0x00: ad 01 01 04 ac 4b c8 1d f7 b6 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff f0 50 02 11 00 00 00 00 07 0a 20 45
Address 0x10: 6c 61 70 73 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 13 04 07
Address 0x30: dc ff ff ff ad 01 01 04 ac 4b c8 1d f7 b6 ff ff
Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 45 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff f3 55 55 55 55 55 55 55 55 55 55 55 55
Xcvr 5        NON-JNPR    37700171YY0084    QSFP-100GBASE-LR4
Xcvr 25       NON-JNPR    GDA2017459        QSFP-100GBASE-LR4

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Xcvr 29 FPC 2	REV 32	NON-JNPR 750-051357	GDF2008750 ACPB0341	QSFP-100GBASE-LR4 LC1101 - 30C / 30Q / 96X
Jedec Code:	0x7fb0	EEPROM Version:	0x02	
P/N:	750-051357	S/N:	ACPB0341	
Assembly ID:	0x0be8	Assembly Version:	01.32	
Date:	06-04-2016	Assembly Flags:	0x00	
Version:	REV 32	CLEI Code:	CMUIANABAA	
ID:	ULC-30Q28	FRU Model Number:	QFX10000-30C	
Board Information Record:				
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff				
I2C Hex Data:				
Address 0x00: 7f b0 02 ff 0b e8 01 20 52 45 56 20 33 32 00 00				
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 31 33 35 37 00 00				
Address 0x20: 53 2f 4e 20 41 43 50 42 30 33 34 31 00 04 06 07				
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff				
Address 0x40: ff ff ff ff 01 43 4d 55 49 41 4e 41 42 41 41 51				
Address 0x50: 46 58 31 30 30 30 30 2d 33 30 43 00 00 00 00 00				
Address 0x60: 00 00 00 00 00 00 41 42 00 ff ff ff ff ff ff ff				
Address 0x70: ff ff ff ef ff ff ff ff ff ff ff ff ff ff ff				
CPU		BUILTIN	BUILTIN	FPC CPU
Jedec Code:	0x7fb0	EEPROM Version:	0x02	
P/N:	BUILTIN	S/N:	BUILTIN	
Assembly ID:	0xf020	Assembly Version:	02.17	
Date:	04-19-2012	Assembly Flags:	0x00	
Board Information Record:				
Address 0x00: ad 01 01 04 ac 4b c8 1d f7 b6 ff ff ff ff ff ff				
I2C Hex Data:				
Address 0x00: 7f b0 02 ff f0 20 02 11 00 00 67 00 0a 00 b0 8c				
Address 0x10: 09 38 bb ff 42 55 49 4c 54 49 4e 00 00 00 67 00				
Address 0x20: 42 55 49 4c 54 49 4e 00 42 55 49 4c 00 13 04 07				
Address 0x30: dc ff ff ff ad 01 01 04 ac 4b c8 1d f7 b6 ff ff				
Address 0x40: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00				
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00				
Address 0x60: 00 00 00 00 00 00 45 00 00 ff ff ff ff ff ff ff				
Address 0x70: ff ff ff f3 50 36 36 36 36 00 00 00 00 00 00 00				
PIC 0		BUILTIN	BUILTIN	30x100GE/30x40GE/96x10GE
Jedec Code:	0x7fb0	EEPROM Version:	0x02	
P/N:	BUILTIN	S/N:	BUILTIN	
Assembly ID:	0xf050	Assembly Version:	02.17	
Date:	04-19-2012	Assembly Flags:	0x00	
Board Information Record:				
Address 0x00: ad 01 01 04 ac 4b c8 1d f7 b6 ff ff ff ff ff ff				
I2C Hex Data:				
Address 0x00: 7f b0 02 ff f0 50 02 11 00 00 00 00 07 0a 20 45				
Address 0x10: 6c 61 70 73 42 55 49 4c 54 49 4e 00 25 73 3a 20				
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 13 04 07				
Address 0x30: dc ff ff ff ad 01 01 04 ac 4b c8 1d f7 b6 ff ff				
Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 00				
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00				
Address 0x60: 00 00 00 00 00 00 45 00 00 ff ff ff ff ff ff ff				
Address 0x70: ff ff ff f3 de ad be ef de ad be ef de ad be ef				
Xcvr 0		NON-JNPR	37700170YZC305	QSFP-100GBASE-LR4
Xcvr 4		NON-JNPR	37700170YZC306	QSFP-100GBASE-LR4
Xcvr 9	REV 01	740-054053	QF36013S	QSFP+-4X10G-SR
Xcvr 12	REV 01	740-067442	XV301AU	QSFP+-40G-SR4
Xcvr 14	REV 01	740-043308	UWE2CG9	QSFP+-40G-LR4
Xcvr 16	REV 01	740-043308	UWH141S	QSFP+-40G-LR4
Xcvr 17	REV 01	740-058734	1ECQ11180VH	QSFP-100GBASE-SR4

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Xcvr 18      REV 01    740-054050    INFAJ0492237    QSFP+-4X10G-LR
Xcvr 26      REV 01    740-058734    1ACQ111803N    QSFP-100GBASE-SR4
Xcvr 27      REV 01    740-058734    1ACQ113405S    QSFP-100GBASE-SR4
FPC 3        REV 35    750-051357    ACPD2186        LC1101 - 30C / 30Q / 96X

Jedec Code:  0x7fb0      EEPROM Version: 0x02
P/N:         750-051357  S/N:           ACPD2186
Assembly ID: 0x0be8      Assembly Version: 01.35
Date:        09-21-2016  Assembly Flags: 0x00
Version:     REV 35      CLEI Code:     CMUIANABAA
ID: ULC-30Q28           FRU Model Number: QFX10000-30C

Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b e8 01 23 52 45 56 20 33 35 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 31 33 35 37 00 00
Address 0x20: 53 2f 4e 20 41 43 50 44 32 31 38 36 00 15 09 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 49 41 4e 41 42 41 41 51
Address 0x50: 46 58 31 30 30 30 30 2d 33 30 43 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 41 44 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff f1 ff ff ff ff ff ff ff ff ff ff ff ff
CPU          BUILTIN    BUILTIN    FPC CPU
Jedec Code:  0x7fb0      EEPROM Version: 0x02
P/N:         BUILTIN     S/N:           BUILTIN
Assembly ID: 0xf020      Assembly Version: 02.17
Date:        04-19-2012  Assembly Flags: 0x00

Board Information Record:
Address 0x00: ad 01 01 04 ac 4b c8 1d f7 b6 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff f0 20 02 11 00 80 70 fa 09 00 50 8f
Address 0x10: 09 38 bb ff 42 55 49 4c 54 49 4e 00 00 80 70 fa
Address 0x20: 42 55 49 4c 54 49 4e 00 42 55 49 4c 00 13 04 07
Address 0x30: dc ff ff ff ad 01 01 04 ac 4b c8 1d f7 b6 ff ff
Address 0x40: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 45 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff f3 50 36 36 36 36 00 00 00 00 00 00 00
PIC 0        BUILTIN    BUILTIN    30x100GE/30x40GE/96x10GE

Jedec Code:  0x7fb0      EEPROM Version: 0x02
P/N:         BUILTIN     S/N:           BUILTIN
Assembly ID: 0xf050      Assembly Version: 02.17
Date:        04-19-2012  Assembly Flags: 0x00

Board Information Record:
Address 0x00: ad 01 01 04 ac 4b c8 1d f7 b6 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff f0 50 02 11 00 00 00 00 07 0a 20 45
Address 0x10: 6c 61 70 73 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 13 04 07
Address 0x30: dc ff ff ff ad 01 01 04 ac 4b c8 1d f7 b6 ff ff
Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 45 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff f3 55 55 55 55 55 55 55 55 55 55 55 55
Xcvr 0      REV 01    740-061409    1GCQA1470A3    QSFP-100GBASE-LR4-T2
Xcvr 1      REV 01    740-061409    1GCQA1470XC    QSFP-100GBASE-LR4-T2
Xcvr 7      NON-JNPR   FG4550500008    QSFP-100G-CWDM4
Xcvr 24     REV 01    740-058734    1ECQ11381LX    QSFP-100GBASE-SR4
Xcvr 29     REV 01    740-043308    UWE0UYS        QSFP+-40G-LR4

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FPC 5          REV 08    750-068822    ACPF0057          LC1102 - 12C / 36Q /
144X
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-068822      S/N:             ACPF0057
Assembly ID:   0x0be7          Assembly Version: 01.08
Date:          09-01-2016      Assembly Flags:   0x00
Version:       REV 08          CLEI Code:        CMUIAM9BAB
ID: ULC-36Q-12Q28              FRU Model Number: QFX10000-36Q

Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b e7 01 08 52 45 56 20 30 38 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 36 38 38 32 32 00 00
Address 0x20: 53 2f 4e 20 41 43 50 46 30 30 35 37 00 01 09 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 49 41 4d 39 42 41 42 51
Address 0x50: 46 58 31 30 30 30 30 2d 33 36 51 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 42 45 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
CPU          BUILTIN          BUILTIN          FPC CPU
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           BUILTIN          S/N:             BUILTIN
Assembly ID:   0xf020          Assembly Version: 02.17
Date:          04-19-2012      Assembly Flags:   0x00
Board Information Record:
Address 0x00: ad 01 01 04 ac 4b c8 1d f7 b6 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff f0 20 02 11 00 00 3d fa 09 00 90 94
Address 0x10: 09 38 bb ff 42 55 49 4c 54 49 4e 00 00 00 3d fa
Address 0x20: 42 55 49 4c 54 49 4e 00 42 55 49 4c 00 13 04 07
Address 0x30: dc ff ff ff ad 01 01 04 ac 4b c8 1d f7 b6 ff ff
Address 0x40: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 45 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff f3 50 36 36 36 36 00 00 00 00 00 00 00
PIC 0          BUILTIN          BUILTIN          12x100GE/36x40GE/144x10GE

Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           BUILTIN          S/N:             BUILTIN
Assembly ID:   0xf050          Assembly Version: 02.17
Date:          04-19-2012      Assembly Flags:   0x00
Board Information Record:
Address 0x00: ad 01 01 04 ac 4b c8 1d f7 b6 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff f0 50 02 11 00 00 00 00 07 0a 20 45
Address 0x10: 6c 61 70 73 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 13 04 07
Address 0x30: dc ff ff ff ad 01 01 04 ac 4b c8 1d f7 b6 ff ff
Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 45 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff f3 55 55 55 55 55 55 55 55 55 55 55 55

FPC 6          REV 08    750-068822    ACPE9951          LC1102 - 12C / 36Q /
144X
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-068822      S/N:             ACPE9951
Assembly ID:   0x0be7          Assembly Version: 01.08
Date:          09-01-2016      Assembly Flags:   0x00
Version:       REV 08          CLEI Code:        CMUIAM9BAB
ID: ULC-36Q-12Q28              FRU Model Number: QFX10000-36Q

```



## Board Information Record:

Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff

## I2C Hex Data:

Address 0x00: 7f b0 02 ff 0b e7 01 08 52 45 56 20 30 38 00 00  
 Address 0x10: 00 00 00 00 37 35 30 2d 30 36 38 38 32 32 00 00  
 Address 0x20: 53 2f 4e 20 41 43 50 45 39 39 35 31 00 01 09 07  
 Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff  
 Address 0x40: ff ff ff ff 01 43 4d 55 49 41 4d 39 42 41 42 51  
 Address 0x50: 46 58 31 30 30 30 30 2d 33 36 51 00 00 00 00 00  
 Address 0x60: 00 00 00 00 00 00 42 45 00 ff ff ff ff ff ff ff  
 Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff

CPU BUILTIN BUILTIN FPC CPU

Jedec Code: 0x7fb0 EEPROM Version: 0x02

P/N: BUILTIN S/N: BUILTIN

Assembly ID: 0xf020 Assembly Version: 02.17

Date: 04-19-2012 Assembly Flags: 0x00

## Board Information Record:

Address 0x00: ad 01 01 04 ac 4b c8 1d f7 b6 ff ff ff ff ff ff

## I2C Hex Data:

Address 0x00: 7f b0 02 ff f0 20 02 11 00 c0 3e fa 09 00 30 97  
 Address 0x10: 09 38 bb ff 42 55 49 4c 54 49 4e 00 00 c0 3e fa  
 Address 0x20: 42 55 49 4c 54 49 4e 00 42 55 49 4c 00 13 04 07  
 Address 0x30: dc ff ff ff ad 01 01 04 ac 4b c8 1d f7 b6 ff ff  
 Address 0x40: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00  
 Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  
 Address 0x60: 00 00 00 00 00 00 45 00 00 ff ff ff ff ff ff ff  
 Address 0x70: ff ff ff f3 50 36 36 36 36 00 00 00 00 00 00 00

PIC 0 BUILTIN BUILTIN 12x100GE/36x40GE/144x10GE

Jedec Code: 0x7fb0 EEPROM Version: 0x02

P/N: BUILTIN S/N: BUILTIN

Assembly ID: 0xf050 Assembly Version: 02.17

Date: 04-19-2012 Assembly Flags: 0x00

## Board Information Record:

Address 0x00: ad 01 01 04 ac 4b c8 1d f7 b6 ff ff ff ff ff ff

## I2C Hex Data:

Address 0x00: 7f b0 02 ff f0 50 02 11 00 00 00 00 07 0a 20 45  
 Address 0x10: 6c 61 70 73 42 55 49 4c 54 49 4e 00 25 73 3a 20  
 Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 13 04 07  
 Address 0x30: dc ff ff ff ad 01 01 04 ac 4b c8 1d f7 b6 ff ff  
 Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 00  
 Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  
 Address 0x60: 00 00 00 00 00 00 45 00 00 ff ff ff ff ff ff ff  
 Address 0x70: ff ff ff f3 55 55 55 55 55 55 55 55 55 55 55

Xcvr 1	REV 01	740-054053	QF3208LG	QSFP+-4X10G-SR
Xcvr 7	REV 01	740-067442	XV20LGN	QSFP+-40G-SR4
Xcvr 8	REV 01	740-067442	XV20VMV	QSFP+-40G-SR4
Xcvr 9	REV 01	740-067442	XV20KCN	QSFP+-40G-SR4
Xcvr 10	REV 01	740-067442	XU504QD	QSFP+-40G-SR4
Xcvr 11	REV 01	740-067442	XU504X7	QSFP+-40G-SR4
Xcvr 12	REV 01	740-067442	XU504W8	QSFP+-40G-SR4
Xcvr 16	REV 01	740-032986	QF4301JP	QSFP+-40G-SR4
Xcvr 17	REV 01	740-032986	QF4303AE	QSFP+-40G-SR4
Xcvr 18	REV 01	740-054050	INFAJ0492400	QSFP+-4X10G-LR
Xcvr 19	REV 01	740-054050	INFAJ0492142	QSFP+-4X10G-LR
Xcvr 24	REV 01	740-032986	QF4301KB	QSFP+-40G-SR4
Xcvr 25	REV 01	740-032986	QF4303YP	QSFP+-40G-SR4
Xcvr 30	REV 01	740-067442	XV300ZX	QSFP+-40G-SR4
Xcvr 31	REV 01	740-043308	UWH2KBW	QSFP+-40G-LR4
Xcvr 34	REV 01	740-054053	QG1501YU	QSFP+-4X10G-SR

```

FPD Board          REV 07    711-054687    ACPC7142          Front Panel Display
Jedec Code:       0x7fb0          EEPROM Version:    0x01
P/N:              711-054687      S/N:              ACPC7142
Assembly ID:      0x0bf2          Assembly Version:  01.07
Date:             07-22-2016      Assembly Flags:    0x00
Version:          REV 07
ID: QFX10000 FPD
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 01 ff 0b f2 01 07 52 45 56 20 30 37 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 35 34 36 38 37 00 00
  Address 0x20: 53 2f 4e 20 41 43 50 43 37 31 34 32 00 16 07 07
  Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff

Power Supply 0     REV 02    740-049388    1EDL62102N9      Power Supply AC
Jedec Code:       0x7fb0          EEPROM Version:    0x02
P/N:              740-049388      S/N:              1EDL62102N9
Assembly ID:      0x0483          Assembly Version:  01.02
Date:             05-25-2016      Assembly Flags:    0x00
Version:          REV 02          CLEI Code:         CMUPADNBAA
ID: QFX10000 AC    FRU Model Number:  QFX10000-PWR-AC
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 83 01 02 52 45 56 20 30 32 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 39 33 38 38 00 00
  Address 0x20: 31 45 44 4c 36 32 31 30 32 4e 39 00 00 19 05 07
  Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 43 4d 55 50 41 44 4e 42 41 41 51
  Address 0x50: 46 58 31 30 30 30 30 2d 50 57 52 2d 41 43 00 00
  Address 0x60: 00 00 00 00 00 00 01 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff dc ff ff ff ff ff ff ff ff ff ff ff ff

Power Supply 1     REV 02    740-049388    1EDL60300KX      Power Supply AC
Jedec Code:       0x7fb0          EEPROM Version:    0x02
P/N:              740-049388      S/N:              1EDL60300KX
Assembly ID:      0x0483          Assembly Version:  01.02
Date:             01-20-2016      Assembly Flags:    0x00
Version:          REV 02          CLEI Code:         CMUPADNBAA
ID: QFX10000 AC    FRU Model Number:  QFX10000-PWR-AC
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 83 01 02 52 45 56 20 30 32 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 39 33 38 38 00 00
  Address 0x20: 31 45 44 4c 36 30 33 30 30 4b 58 00 00 14 01 07
  Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 43 4d 55 50 41 44 4e 42 41 41 51
  Address 0x50: 46 58 31 30 30 30 30 2d 50 57 52 2d 41 43 00 00
  Address 0x60: 00 00 00 00 00 00 01 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff dc ff ff ff ff ff ff ff ff ff ff ff ff

Power Supply 2     REV 02    740-049388    1EDL60300DL      Power Supply AC
Jedec Code:       0x7fb0          EEPROM Version:    0x02
P/N:              740-049388      S/N:              1EDL60300DL
Assembly ID:      0x0483          Assembly Version:  01.02
Date:             01-20-2016      Assembly Flags:    0x00
Version:          REV 02          CLEI Code:         CMUPADNBAA

```

```

ID: QFX10000 AC                      FRU Model Number: QFX10000-PWR-AC
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 83 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 34 39 33 38 38 00 00
Address 0x20: 31 45 44 4c 36 30 33 30 30 44 4c 00 00 14 01 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 50 41 44 4e 42 41 41 51
Address 0x50: 46 58 31 30 30 30 30 2d 50 57 52 2d 41 43 00 00
Address 0x60: 00 00 00 00 00 00 01 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff dc ff ff ff ff ff ff ff ff ff ff ff ff
Power Supply 3  REV 02  740-049388  1EDL61701BT  Power Supply AC
Jedec Code: 0x7fb0          EEPROM Version: 0x02
P/N: 740-049388            S/N: 1EDL61701BT
Assembly ID: 0x0483        Assembly Version: 01.02
Date: 05-01-2016          Assembly Flags: 0x00
Version: REV 02            CLEI Code: CMUPADNBAA
ID: QFX10000 AC           FRU Model Number: QFX10000-PWR-AC
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 83 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 34 39 33 38 38 00 00
Address 0x20: 31 45 44 4c 36 31 37 30 31 42 54 00 00 01 05 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 50 41 44 4e 42 41 41 51
Address 0x50: 46 58 31 30 30 30 30 2d 50 57 52 2d 41 43 00 00
Address 0x60: 00 00 00 00 00 00 01 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff dc ff ff ff ff ff ff ff ff ff ff ff ff
Power Supply 4  REV 02  740-049388  1EDL62102P7  Power Supply AC
Jedec Code: 0x7fb0          EEPROM Version: 0x02
P/N: 740-049388            S/N: 1EDL62102P7
Assembly ID: 0x0483        Assembly Version: 01.02
Date: 05-25-2016          Assembly Flags: 0x00
Version: REV 02            CLEI Code: CMUPADNBAA
ID: QFX10000 AC           FRU Model Number: QFX10000-PWR-AC
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 83 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 34 39 33 38 38 00 00
Address 0x20: 31 45 44 4c 36 32 31 30 32 50 37 00 00 19 05 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 50 41 44 4e 42 41 41 51
Address 0x50: 46 58 31 30 30 30 30 2d 50 57 52 2d 41 43 00 00
Address 0x60: 00 00 00 00 00 00 01 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff dc ff ff ff ff ff ff ff ff ff ff ff ff
Power Supply 5  REV 02  740-049388  1EDL62102PP  Power Supply AC
Jedec Code: 0x7fb0          EEPROM Version: 0x02
P/N: 740-049388            S/N: 1EDL62102PP
Assembly ID: 0x0483        Assembly Version: 01.02
Date: 05-25-2016          Assembly Flags: 0x00
Version: REV 02            CLEI Code: CMUPADNBAA
ID: QFX10000 AC           FRU Model Number: QFX10000-PWR-AC
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 83 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 34 39 33 38 38 00 00

```

```

Address 0x20: 31 45 44 4c 36 32 31 30 32 50 50 00 00 19 05 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 50 41 44 4e 42 41 41 51
Address 0x50: 46 58 31 30 30 30 30 2d 50 57 52 2d 41 43 00 00
Address 0x60: 00 00 00 00 00 00 01 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff dc ff ff ff ff ff ff ff ff ff ff ff ff
FTC 0          REV 14    750-050108    ACPE4038          Fan Controller 8
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-050108      S/N:           ACPE4038
Assembly ID:   0x0bee          Assembly Version: 01.14
Date:          09-27-2016      Assembly Flags: 0x00
Version:       REV 14          CLEI Code:     CMUCAHZCAA
ID: QFX10000 FTC              FRU Model Number: QFX10008-FAN-CTRL
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b ee 01 0e 52 45 56 20 31 34 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 30 31 30 38 00 00
Address 0x20: 53 2f 4e 20 41 43 50 45 34 30 33 38 00 1b 09 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 5a 43 41 41 51
Address 0x50: 46 58 31 30 30 30 38 2d 46 41 4e 2d 43 54 52 4c
Address 0x60: 00 00 00 00 00 00 41 44 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 98 ff ff ff ff ff ff ff ff ff ff ff ff
FTC 1          REV 14    750-050108    ACPE4032          Fan Controller 8
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-050108      S/N:           ACPE4032
Assembly ID:   0x0bee          Assembly Version: 01.14
Date:          09-27-2016      Assembly Flags: 0x00
Version:       REV 14          CLEI Code:     CMUCAHZCAA
ID: QFX10000 FTC              FRU Model Number: QFX10008-FAN-CTRL
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b ee 01 0e 52 45 56 20 31 34 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 30 31 30 38 00 00
Address 0x20: 53 2f 4e 20 41 43 50 45 34 30 33 32 00 1b 09 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 5a 43 41 41 51
Address 0x50: 46 58 31 30 30 30 38 2d 46 41 4e 2d 43 54 52 4c
Address 0x60: 00 00 00 00 00 00 41 44 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 98 ff ff ff ff ff ff ff ff ff ff ff ff
Fan Tray 0     REV 09    760-054372    ACPD6799          Fan Tray 8
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           760-054372      S/N:           ACPD6799
Assembly ID:   0x0bf0          Assembly Version: 01.09
Date:          09-28-2016      Assembly Flags: 0x00
Version:       REV 09          CLEI Code:     CMUCAHYCAA
ID: QFX10008 FHB              FRU Model Number: QFX10008-FAN
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b f0 01 09 52 45 56 20 30 39 00 00
Address 0x10: 00 00 00 00 37 36 30 2d 30 35 34 33 37 32 00 00
Address 0x20: 53 2f 4e 20 41 43 50 44 36 37 39 39 00 1c 09 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 59 43 41 41 51
Address 0x50: 46 58 31 30 30 30 38 2d 46 41 4e 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff f1 ff ff ff ff ff ff ff ff ff ff ff ff

```

```

Fan Tray 1      REV 09   760-054372   ACNZ3584      Fan Tray 8
Jedec Code:    0x7fb0      EEPROM Version: 0x02
P/N:           760-054372   S/N:           ACNZ3584
Assembly ID:   0x0bf0      Assembly Version: 01.09
Date:          08-30-2016   Assembly Flags: 0x00
Version:       REV 09      CLEI Code:     CMUCAHYCAA
ID: QFX10008 FHB          FRU Model Number: QFX10008-FAN

Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b f0 01 09 52 45 56 20 30 39 00 00
Address 0x10: 00 00 00 00 37 36 30 2d 30 35 34 33 37 32 00 00
Address 0x20: 53 2f 4e 20 41 43 4e 5a 33 35 38 34 00 1e 08 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 59 43 41 41 51
Address 0x50: 46 58 31 30 30 30 38 2d 46 41 4e 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff f1 ff ff ff ff ff ff ff ff ff ff ff ff

SIB 0           REV 24   750-050058   ACPD4587      Switch Fabric 8
Jedec Code:    0x7fb0      EEPROM Version: 0x02
P/N:           750-050058   S/N:           ACPD4587
Assembly ID:   0x0bec      Assembly Version: 01.24
Date:          06-19-2016   Assembly Flags: 0x00
Version:       REV 24      CLEI Code:     CMUCAHOCAA
ID: QFX10008 SIB          FRU Model Number: QFX10008-SF

Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b ec 01 18 52 45 56 20 32 34 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 30 30 35 38 00 00
Address 0x20: 53 2f 4e 20 41 43 50 44 34 35 38 37 00 13 06 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 30 43 41 41 51
Address 0x50: 46 58 31 30 30 30 38 2d 53 46 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 41 45 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff d1 00 00 00 00 00 00 00 00 00 00 00 00

SIB 1           REV 24   750-050058   ACNZ0635      Switch Fabric 8
Jedec Code:    0x7fb0      EEPROM Version: 0x02
P/N:           750-050058   S/N:           ACNZ0635
Assembly ID:   0x0bec      Assembly Version: 01.24
Date:          06-06-2016   Assembly Flags: 0x00
Version:       REV 24      CLEI Code:     CMUCAHOCAA
ID: QFX10008 SIB          FRU Model Number: QFX10008-SF

Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b ec 01 18 52 45 56 20 32 34 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 30 30 35 38 00 00
Address 0x20: 53 2f 4e 20 41 43 4e 5a 30 36 33 35 00 06 06 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 30 43 41 41 51
Address 0x50: 46 58 31 30 30 30 38 2d 53 46 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 41 45 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff d1 00 00 00 00 00 00 00 00 00 00 00 00

SIB 2           REV 24   750-050058   ACPD4908      Switch Fabric 8
Jedec Code:    0x7fb0      EEPROM Version: 0x02
P/N:           750-050058   S/N:           ACPD4908
Assembly ID:   0x0bec      Assembly Version: 01.24
Date:          07-12-2016   Assembly Flags: 0x00
Version:       REV 24      CLEI Code:     CMUCAHOCAA

```

```

ID: QFX10008 SIB                      FRU Model Number: QFX10008-SF
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b ec 01 18 52 45 56 20 32 34 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 30 30 35 38 00 00
Address 0x20: 53 2f 4e 20 41 43 50 44 34 39 30 38 00 0c 07 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 30 43 41 41 51
Address 0x50: 46 58 31 30 30 30 38 2d 53 46 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 41 45 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff d1 00 00 00 00 00 00 00 00 00 00 00 00
SIB 3                      REV 24      750-050058      ACNZ0617      Switch Fabric 8
Jedec Code: 0x7fb0          EEPROM Version: 0x02
P/N: 750-050058            S/N: ACNZ0617
Assembly ID: 0x0bec         Assembly Version: 01.24
Date: 06-07-2016           Assembly Flags: 0x00
Version: REV 24            CLEI Code: CMUCAHOCAA
ID: QFX10008 SIB          FRU Model Number: QFX10008-SF
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b ec 01 18 52 45 56 20 32 34 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 30 30 35 38 00 00
Address 0x20: 53 2f 4e 20 41 43 4e 5a 30 36 31 37 00 07 06 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 30 43 41 41 51
Address 0x50: 46 58 31 30 30 30 38 2d 53 46 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 41 45 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff d1 00 00 00 00 00 00 00 00 00 00 00 00
SIB 4                      REV 24      750-050058      ACNZ0527      Switch Fabric 8
Jedec Code: 0x7fb0          EEPROM Version: 0x02
P/N: 750-050058            S/N: ACNZ0527
Assembly ID: 0x0bec         Assembly Version: 01.24
Date: 06-06-2016           Assembly Flags: 0x00
Version: REV 24            CLEI Code: CMUCAHOCAA
ID: QFX10008 SIB          FRU Model Number: QFX10008-SF
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b ec 01 18 52 45 56 20 32 34 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 30 30 35 38 00 00
Address 0x20: 53 2f 4e 20 41 43 4e 5a 30 35 32 37 00 06 06 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 30 43 41 41 51
Address 0x50: 46 58 31 30 30 30 38 2d 53 46 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 41 45 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff d1 00 00 00 00 00 00 00 00 00 00 00 00
SIB 5                      REV 23      750-050058      ACNX6980      Switch Fabric 8
Jedec Code: 0x7fb0          EEPROM Version: 0x02
P/N: 750-050058            S/N: ACNX6980
Assembly ID: 0x0bec         Assembly Version: 01.23
Date: 05-16-2016           Assembly Flags: 0x00
Version: REV 23            CLEI Code: CMUCAHOCAA
ID: QFX10008 SIB          FRU Model Number: QFX10008-SF
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b ec 01 17 52 45 56 20 32 33 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 30 30 35 38 00 00

```

```

Address 0x20: 53 2f 4e 20 41 43 4e 58 36 39 38 30 00 10 05 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 30 43 41 41 51
Address 0x50: 46 58 31 30 30 30 38 2d 53 46 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 41 42 00 ff ff ff ff ff ff
Address 0x70: ff ff ff ce 00 00 00 00 00 00 00 00 00 00 00

```

### show chassis hardware extensive (PTX10016 Router)

```
user@host> show chassis hardware extensive
```

```

Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis
Jedec Code:   0x7fb0          EEPROM Version: 0x02
S/N:          DH995
Assembly ID:  0x0566          Assembly Version: 01.22
Date:         02-16-2017     Assembly Flags:  0x00
CLEI Code:    CMMUN00ARA
ID: JNP10016          FRU Model Number: QFX10016-CHAS
Board Information Record:
Address 0x00: ad 01 10 00 44 aa 50 ab 1b b6 ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 05 66 01 16 00 45 56 20 32 32 00 00
Address 0x10: 00 00 00 00 00 35 30 2d 30 35 36 35 35 35 00 00
Address 0x20: 44 48 39 39 35 00 00 00 00 00 00 00 10 02 07
Address 0x30: e1 ff ff ff ad 01 10 00 44 aa 50 ab 1b b6 ff ff
Address 0x40: ff ff ff ff 01 43 4d 4d 55 4e 30 30 41 52 41 51
Address 0x50: 46 58 31 30 30 31 36 2d 43 48 41 53 00 00 00 00
Address 0x60: 00 00 00 00 00 00 32 41 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 51 44 48 39 39 35 00 00 00 00 00 00 00
Midplane      REV 22    750-056555    ACPM7810      Midplane 16
Jedec Code:   0x7fb0          EEPROM Version: 0x02
P/N:          750-056555      S/N:          ACPM7810
Assembly ID:  0x0be4          Assembly Version: 01.22
Date:         02-16-2017     Assembly Flags:  0x00
Version:      REV 22          CLEI Code:    CMMUN00ARA
ID: QFX10016 Midplane        FRU Model Number: QFX10016-CHAS
Board Information Record:
Address 0x00: ad 01 10 00 44 aa 50 ab 1b b6 ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b e4 01 16 52 45 56 20 32 32 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 36 35 35 35 00 00
Address 0x20: 53 2f 4e 20 41 43 50 4d 37 38 31 30 00 10 02 07
Address 0x30: e1 ff ff ff ad 01 10 00 44 aa 50 ab 1b b6 ff ff
Address 0x40: ff ff ff ff 01 43 4d 4d 55 4e 30 30 41 52 41 51
Address 0x50: 46 58 31 30 30 31 36 2d 43 48 41 53 00 00 00 00
Address 0x60: 00 00 00 00 00 00 32 41 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 51 44 48 39 39 35 00 00 00 00 00 00 00
Routing Engine 0          BUILTIN          BUILTIN          RE-PTX-2X00x4
vtbd0 15360 MB            Virtio Block Disk
vtbd1 15360 MB            Virtio Block Disk
ada0 128 MB QEMU          QM00002          Virtio Block Disk
usb0 (addr 0.1) EHCI root HUB 0 Intel          uhub0
usb1 (addr 0.2) product 0x0020 32 vendor 0x8087    uhub1
Routing Engine 1          BUILTIN          BUILTIN          RE-PTX-2X00x4
vtbd0 15360 MB            Virtio Block Disk
vtbd1 15360 MB            Virtio Block Disk
ada0 128 MB QEMU          QM00002          Virtio Block Disk

```

```

usb0 (addr 0.1) EHCI root HUB 0      Intel      uhub0
usb1 (addr 0.2) product 0x0020 32    vendor 0x8087 uhub1
CB 0      REV 03    750-068820    ACPL7238    Control Board
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N:      750-068820    S/N:      ACPL7238
Assembly ID: 0x0b9d    Assembly Version: 01.03
Date:      03-15-2017  Assembly Flags: 0x00
Version:    REV 03      CLEI Code: CMUCAH3CTB
ID: Control Board      FRU Model Number: QFX10000-RE
Board Information Record:
Address 0x00: ad 01 00 10 e8 b6 c2 46 aa 29 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 9d 01 03 52 45 56 20 30 33 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 36 38 38 32 30 00 00
Address 0x20: 53 2f 4e 20 41 43 50 4c 37 32 33 38 00 0f 03 07
Address 0x30: e1 ff ff ff ad 01 00 10 e8 b6 c2 46 aa 29 ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 33 43 54 42 51
Address 0x50: 46 58 31 30 30 30 30 2d 52 45 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 42 41 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff db ff ff ff ff ff ff ff ff ff ff ff ff
CB 1      REV 03    750-068820    ACPL7298    Control Board
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N:      750-068820    S/N:      ACPL7298
Assembly ID: 0x0b9d    Assembly Version: 01.03
Date:      03-15-2017  Assembly Flags: 0x00
Version:    REV 03      CLEI Code: CMUCAH3CTB
ID: Control Board      FRU Model Number: QFX10000-RE
Board Information Record:
Address 0x00: ad 01 00 10 e8 b6 c2 46 99 b9 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 9d 01 03 52 45 56 20 30 33 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 36 38 38 32 30 00 00
Address 0x20: 53 2f 4e 20 41 43 50 4c 37 32 39 38 00 0f 03 07
Address 0x30: e1 ff ff ff ad 01 00 10 e8 b6 c2 46 99 b9 ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 33 43 54 42 51
Address 0x50: 46 58 31 30 30 30 30 2d 52 45 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 42 41 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff db ff ff ff ff ff ff ff ff ff ff ff ff
FPC 1      REV 36    750-077140    ACNP4590    LC1102 - 12C / 36Q /
144X
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N:      750-077140    S/N:      ACNP4590
Assembly ID: 0x0be7    Assembly Version: 01.36
Date:      10-17-2016  Assembly Flags: 0x00
Version:    REV 36      CLEI Code: CMUIAM9BAA
ID: ULC-36Q-12Q28      FRU Model Number: QFX10000-36Q
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b e7 01 24 52 45 56 20 33 36 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 37 37 31 34 30 00 00
Address 0x20: 53 2f 4e 20 41 43 4e 50 34 35 39 30 00 11 0a 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 49 41 4d 39 42 41 41 51
Address 0x50: 46 58 31 30 30 30 30 2d 33 36 51 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 42 45 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff fe ff ff ff ff ff ff ff ff ff ff ff ff
CPU      BUILTIN      BUILTIN      FPC CPU
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N:      BUILTIN      S/N:      BUILTIN

```



```

Assembly ID: 0xf020      Assembly Version: 02.17
Date: 04-19-2012      Assembly Flags: 0x00
Board Information Record:
Address 0x00: ad 01 01 04 ac 4b c8 1d f7 b6 ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff f0 20 02 11 00 40 36 bd 09 40 25 32
Address 0x10: 09 e8 ba ff 42 55 49 4c 54 49 4e 00 00 40 36 bd
Address 0x20: 42 55 49 4c 54 49 4e 00 42 55 49 4c 00 13 04 07
Address 0x30: dc ff ff ff ad 01 01 04 ac 4b c8 1d f7 b6 ff ff
Address 0x40: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 45 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff f3 50 36 36 36 36 00 00 00 00 00 00 00
PIC 0      BUILTIN      BUILTIN      12x100GE/36x40GE/144x10GE

Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N: BUILTIN      S/N: BUILTIN
Assembly ID: 0xf050      Assembly Version: 02.17
Date: 04-19-2012      Assembly Flags: 0x00
Board Information Record:
Address 0x00: ad 01 01 04 ac 4b c8 1d f7 b6 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff f0 50 02 11 00 00 00 00 07 0a 20 45
Address 0x10: 6c 61 70 73 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 13 04 07
Address 0x30: dc ff ff ff ad 01 01 04 ac 4b c8 1d f7 b6 ff ff
Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 45 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff f3 55 55 55 55 55 55 55 55 55 55 55 55
Xcvr 0      REV 01      740-054053      QF3600AV      QSFP+-4X10G-SR
Xcvr 35     REV 01      740-061405      1ACQ110507K      QSFP-100GBASE-SR4
FPC 3      REV 07      750-071975      CAHA2224      LC1102 - 12C / 36Q /
144X
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N: 750-071975      S/N: CAHA2224
Assembly ID: 0x0be7      Assembly Version: 01.07
Date: 01-17-2017      Assembly Flags: 0x00
Version: REV 07      CLEI Code: PROTOXCLEI
ID: ULC-36Q-12Q28      FRU Model Number: PROTO-ASSEMBLY
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b e7 01 07 52 45 56 20 30 37 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 37 31 39 37 35 00 00
Address 0x20: 53 2f 4e 20 43 41 48 41 32 32 32 34 00 11 01 07
Address 0x30: e1 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff
CPU      BUILTIN      BUILTIN      FPC CPU
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N: BUILTIN      S/N: BUILTIN
Assembly ID: 0xf020      Assembly Version: 02.17
Date: 04-19-2012      Assembly Flags: 0x00
Board Information Record:
Address 0x00: ad 01 01 04 ac 4b c8 1d f7 b6 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff f0 20 02 11 00 60 b6 be 09 c0 cf 38

```

```

Address 0x10: 09 e8 ba ff 42 55 49 4c 54 49 4e 00 00 60 b6 be
Address 0x20: 42 55 49 4c 54 49 4e 00 42 55 49 4c 00 13 04 07
Address 0x30: dc ff ff ff ad 01 01 04 ac 4b c8 1d f7 b6 ff ff
Address 0x40: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 45 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff f3 50 36 36 36 36 00 00 00 00 00 00 00
PIC 0                BUILTIN        BUILTIN        12x100GE/36x40GE/144x10GE

Jedec Code: 0x7fb0          EEPROM Version: 0x02
P/N:        BUILTIN        S/N:        BUILTIN
Assembly ID: 0xf050        Assembly Version: 02.17
Date:       04-19-2012    Assembly Flags: 0x00

Board Information Record:
Address 0x00: ad 01 01 04 ac 4b c8 1d f7 b6 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff f0 50 02 11 00 00 00 00 07 0a 20 45
Address 0x10: 6c 61 70 73 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 13 04 07
Address 0x30: dc ff ff ff ad 01 01 04 ac 4b c8 1d f7 b6 ff ff
Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 45 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff f3 55 55 55 55 55 55 55 55 55 55 55 55
Xcvr 0      REV 01      740-054053      QG1505YM      QSFP+-4X10G-SR
Xcvr 11          NON-JNPR      GDA2017459      QSFP-100GBASE-LR4
Xcvr 35          NON-JNPR      GDF2008750      QSFP-100GBASE-LR4
FPC 5      REV 13      750-068822      ACPD6501      LC1102 - 12C / 36Q /
144X
Jedec Code: 0x7fb0          EEPROM Version: 0x02
P/N:        750-068822      S/N:        ACPD6501
Assembly ID: 0x0be7        Assembly Version: 01.13
Date:       06-29-2017    Assembly Flags: 0x00
Version:    REV 13        CLEI Code:    CMUIAM9BAC
ID: ULC-36Q-12Q28        FRU Model Number: QFX10000-36Q

Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b e7 01 0d 52 45 56 20 31 33 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 36 38 38 32 32 00 00
Address 0x20: 53 2f 4e 20 41 43 50 44 36 35 30 31 00 1d 06 07
Address 0x30: e1 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 49 41 4d 39 42 41 43 51
Address 0x50: 46 58 31 30 30 30 30 2d 33 36 51 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 43 41 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff fd ff ff ff ff ff ff ff ff ff ff ff ff
CPU                BUILTIN        BUILTIN        FPC CPU
Jedec Code: 0x7fb0          EEPROM Version: 0x02
P/N:        BUILTIN        S/N:        BUILTIN
Assembly ID: 0xf020        Assembly Version: 02.17
Date:       04-19-2012    Assembly Flags: 0x00

Board Information Record:
Address 0x00: ad 01 01 04 ac 4b c8 1d f7 b6 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff f0 20 02 11 00 c0 c6 bc 09 c0 ca 40
Address 0x10: 09 e8 ba ff 42 55 49 4c 54 49 4e 00 00 c0 c6 bc
Address 0x20: 42 55 49 4c 54 49 4e 00 42 55 49 4c 00 13 04 07
Address 0x30: dc ff ff ff ad 01 01 04 ac 4b c8 1d f7 b6 ff ff
Address 0x40: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

```

```

Address 0x60: 00 00 00 00 00 00 45 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff f3 50 36 36 36 36 00 00 00 00 00 00 00
PIC 0                BUILTIN          BUILTIN          12x100GE/36x40GE/144x10GE

Jedec Code: 0x7fb0          EEPROM Version: 0x02
P/N:        BUILTIN        S/N:          BUILTIN
Assembly ID: 0xf050        Assembly Version: 02.17
Date:       04-19-2012     Assembly Flags: 0x00

Board Information Record:
Address 0x00: ad 01 01 04 ac 4b c8 1d f7 b6 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff f0 50 02 11 00 00 00 00 07 0a 20 45
Address 0x10: 6c 61 70 73 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 13 04 07
Address 0x30: dc ff ff ff ad 01 01 04 ac 4b c8 1d f7 b6 ff ff
Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 45 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff f3 55 55 55 55 55 55 55 55 55 55 55 55
Xcvr 1      REV 01      740-058734      1ECQ11381LA      QSFP-100GBASE-SR4
Xcvr 2      REV 01      740-043308      UWH141S          QSFP+-40G-LR4
Xcvr 3      REV 01      740-043308      UWE2CG9          QSFP+-40G-LR4
FPC 6       REV 37      750-077140      ACNS2793         LC1102 - 12C / 36Q /
144X

Jedec Code: 0x7fb0          EEPROM Version: 0x02
P/N:        750-077140     S/N:          ACNS2793
Assembly ID: 0x0be7        Assembly Version: 01.37
Date:       03-25-2017     Assembly Flags: 0x00
Version:    REV 37        CLEI Code:    CMUIAM9BAA
ID: ULC-36Q-12Q28         FRU Model Number: QFX10000-36Q

Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b e7 01 25 52 45 56 20 33 37 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 37 37 31 34 30 00 00
Address 0x20: 53 2f 4e 20 41 43 4e 53 32 37 39 33 00 19 03 07
Address 0x30: e1 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 49 41 4d 39 42 41 41 51
Address 0x50: 46 58 31 30 30 30 30 2d 33 36 51 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 42 45 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff fe ff ff ff ff ff ff ff ff ff ff ff ff
CPU                BUILTIN          BUILTIN          FPC CPU

Jedec Code: 0x7fb0          EEPROM Version: 0x02
P/N:        BUILTIN        S/N:          BUILTIN
Assembly ID: 0xf020        Assembly Version: 02.17
Date:       04-19-2012     Assembly Flags: 0x00

Board Information Record:
Address 0x00: ad 01 01 04 ac 4b c8 1d f7 b6 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff f0 20 02 11 00 a0 e6 d4 09 00 bd 43
Address 0x10: 09 e8 ba ff 42 55 49 4c 54 49 4e 00 00 a0 e6 d4
Address 0x20: 42 55 49 4c 54 49 4e 00 42 55 49 4c 00 13 04 07
Address 0x30: dc ff ff ff ad 01 01 04 ac 4b c8 1d f7 b6 ff ff
Address 0x40: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 45 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff f3 50 36 36 36 36 00 00 00 00 00 00 00
PIC 0                BUILTIN          BUILTIN          12x100GE/36x40GE/144x10GE

Jedec Code: 0x7fb0          EEPROM Version: 0x02

```

```

P/N:          BUILTIN          S/N:          BUILTIN
Assembly ID:  0xf050          Assembly Version: 02.17
Date:         04-19-2012      Assembly Flags:  0x00
Board Information Record:
  Address 0x00: ad 01 01 04 ac 4b c8 1d f7 b6 ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff f0 50 02 11 00 00 00 00 07 0a 20 45
  Address 0x10: 6c 61 70 73 42 55 49 4c 54 49 4e 00 25 73 3a 20
  Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 13 04 07
  Address 0x30: dc ff ff ff ad 01 01 04 ac 4b c8 1d f7 b6 ff ff
  Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 45 00 00 ff ff ff ff ff ff
  Address 0x70: ff ff ff f3 55 55 55 55 55 55 55 55 55 55 55
    Xcvr 0      REV 01      740-032986      QH0400VH      QSFP+-40G-SR4
    Xcvr 1      REV 01      740-032986      QH0400VM      QSFP+-40G-SR4
    Xcvr 35     REV 01      740-058734      1ECQ11390ZB   QSFP-100GBASE-SR4
FPC 8          REV 36      750-077140      ACNP4625      LC1102 - 12C / 36Q /
144X
Jedec Code:    0x7fb0          EEPROM Version: 0x02
P/N:          750-077140      S/N:          ACNP4625
Assembly ID:   0x0be7          Assembly Version: 01.36
Date:         10-17-2016      Assembly Flags: 0x00
Version:      REV 36          CLEI Code:    CMUIAM9BAA
ID: ULC-36Q-12Q28            FRU Model Number: QFX10000-36Q
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b e7 01 24 52 45 56 20 33 36 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 37 37 31 34 30 00 00
  Address 0x20: 53 2f 4e 20 41 43 4e 50 34 36 32 35 00 11 0a 07
  Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 43 4d 55 49 41 4d 39 42 41 41 51
  Address 0x50: 46 58 31 30 30 30 30 2d 33 36 51 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 42 45 00 ff ff ff ff ff ff
  Address 0x70: ff ff ff fe ff ff ff ff ff ff ff ff ff ff ff
CPU          BUILTIN          BUILTIN          FPC CPU
Jedec Code:  0x7fb0          EEPROM Version: 0x02
P/N:         BUILTIN          S/N:         BUILTIN
Assembly ID:  0xf020          Assembly Version: 02.17
Date:        04-19-2012      Assembly Flags: 0x00
Board Information Record:
  Address 0x00: ad 01 01 04 ac 4b c8 1d f7 b6 ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff f0 20 02 11 00 c0 e6 d4 09 40 59 4a
  Address 0x10: 09 e8 ba ff 42 55 49 4c 54 49 4e 00 00 c0 e6 d4
  Address 0x20: 42 55 49 4c 54 49 4e 00 42 55 49 4c 00 13 04 07
  Address 0x30: dc ff ff ff ad 01 01 04 ac 4b c8 1d f7 b6 ff ff
  Address 0x40: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 45 00 00 ff ff ff ff ff ff
  Address 0x70: ff ff ff f3 50 36 36 36 36 00 00 00 00 00 00 00
PIC 0          BUILTIN          BUILTIN          12x100GE/36x40GE/144x10GE
Jedec Code:    0x7fb0          EEPROM Version: 0x02
P/N:          BUILTIN          S/N:          BUILTIN
Assembly ID:   0xf050          Assembly Version: 02.17
Date:         04-19-2012      Assembly Flags: 0x00
Board Information Record:
  Address 0x00: ad 01 01 04 ac 4b c8 1d f7 b6 ff ff ff ff ff

```

## I2C Hex Data:

```

Address 0x00: 7f b0 02 ff f0 50 02 11 00 00 00 00 07 0a 20 45
Address 0x10: 6c 61 70 73 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 13 04 07
Address 0x30: dc ff ff ff ad 01 01 04 ac 4b c8 1d f7 b6 ff ff
Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 45 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff f3 55 55 55 55 55 55 55 55 55 55 55 55
  Xcvr 1      REV 01    740-058732    1AMQA14206D    QSFP-100GBASE-LR4
  Xcvr 10     REV 01    740-032986    QF4301KB      QSFP+-40G-SR4
  Xcvr 24     REV 01    740-054050    INFJA0492244  QSFP+-4X10G-LR
FPC 9        REV 35    750-071976    ACPD3055      LC1101 - 30C / 30Q / 96X

```

```

Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N:        750-071976  S/N:          ACPD3055
Assembly ID: 0x0be8     Assembly Version: 01.35
Date:       05-26-2016  Assembly Flags: 0x00
Version:    REV 35     CLEI Code:    CMUIANABAA
ID: ULC-30Q28          FRU Model Number: JNP10K-LC1101

```

## Board Information Record:

```
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
```

## I2C Hex Data:

```

Address 0x00: 7f b0 02 ff 0b e8 01 23 52 45 56 20 33 35 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 37 31 39 37 36 00 00
Address 0x20: 53 2f 4e 20 41 43 50 44 33 30 35 35 00 1a 05 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 49 41 4e 41 42 41 41 4a
Address 0x50: 4e 50 31 30 4b 2d 4c 43 31 31 30 31 00 00 00 00
Address 0x60: 00 00 00 00 00 00 41 42 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff ef ff ff ff ff ff ff ff ff ff ff ff ff
CPU          BUILTIN    BUILTIN    FPC CPU

```

```

Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N:        BUILTIN     S/N:          BUILTIN
Assembly ID: 0xf020     Assembly Version: 02.17
Date:       04-19-2012  Assembly Flags: 0x00

```

## Board Information Record:

```
Address 0x00: ad 01 01 04 ac 4b c8 1d f7 b6 ff ff ff ff ff ff
```

## I2C Hex Data:

```

Address 0x00: 7f b0 02 ff f0 20 02 11 00 20 e7 d4 09 00 a6 d4
Address 0x10: 09 e8 ba ff 42 55 49 4c 54 49 4e 00 00 20 e7 d4
Address 0x20: 42 55 49 4c 54 49 4e 00 42 55 49 4c 00 13 04 07
Address 0x30: dc ff ff ff ad 01 01 04 ac 4b c8 1d f7 b6 ff ff
Address 0x40: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 45 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff f3 50 36 36 36 36 00 00 00 00 00 00 00
PIC 0        BUILTIN    BUILTIN    30x100GE/30x40GE/96x10GE

```

```

Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N:        BUILTIN     S/N:          BUILTIN
Assembly ID: 0xf050     Assembly Version: 02.17
Date:       04-19-2012  Assembly Flags: 0x00

```

## Board Information Record:

```
Address 0x00: ad 01 01 04 ac 4b c8 1d f7 b6 ff ff ff ff ff ff
```

## I2C Hex Data:

```

Address 0x00: 7f b0 02 ff f0 50 02 11 00 00 00 00 07 0a 20 45
Address 0x10: 6c 61 70 73 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 13 04 07
Address 0x30: dc ff ff ff ad 01 01 04 ac 4b c8 1d f7 b6 ff ff

```

```

Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 45 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff f3 55 55 55 55 55 55 55 55 55 55 55 55
Xcvr 0          NON-JNPR      INGBT7970007      QSFP-100GBASE-LR4
Xcvr 1          NON-JNPR      UWQ24D9        QSFP-100GBASE-LR4
Xcvr 2          NON-JNPR      INGBT7970011      QSFP-100GBASE-LR4
Xcvr 3          NON-JNPR      UX60AF1         QSFP-100G-CWDM4
Xcvr 4          NON-JNPR      UX408JJ         QSFP-100GBASE-LR4
Xcvr 11         REV 01       740-058734      1ECQ113835F      QSFP-100GBASE-SR4
Xcvr 18         NON-JNPR      Q7496           QSFP-100G-CWDM4
Xcvr 29         REV 01       740-058734      1ECQ11380LZ      QSFP-100GBASE-SR4
Power Supply 0  REV 02       740-049388      1EDL625039E      Power Supply AC
Jedec Code:     0x7fb0      EEPROM Version: 0x02
P/N:            740-049388   S/N:            1EDL625039E
Assembly ID:    0x0483      Assembly Version: 01.02
Date:           06-19-2016  Assembly Flags:  0x00
Version:        REV 02      CLEI Code:      CMUPADNBAA
ID: QFX10000 AC  FRU Model Number: QFX10000-PWR-AC
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 83 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 34 39 33 38 38 00 00
Address 0x20: 31 45 44 4c 36 32 35 30 33 39 45 00 00 13 06 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 50 41 44 4e 42 41 41 51
Address 0x50: 46 58 31 30 30 30 30 2d 50 57 52 2d 41 43 00 00
Address 0x60: 00 00 00 00 00 00 01 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff dc ff ff ff ff ff ff ff ff ff ff ff ff
Power Supply 1  REV 02       740-049388      1EDL62503AD      Power Supply AC
Jedec Code:     0x7fb0      EEPROM Version: 0x02
P/N:            740-049388   S/N:            1EDL62503AD
Assembly ID:    0x0483      Assembly Version: 01.02
Date:           06-19-2016  Assembly Flags:  0x00
Version:        REV 02      CLEI Code:      CMUPADNBAA
ID: QFX10000 AC  FRU Model Number: QFX10000-PWR-AC
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 83 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 34 39 33 38 38 00 00
Address 0x20: 31 45 44 4c 36 32 35 30 33 41 44 00 00 13 06 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 50 41 44 4e 42 41 41 51
Address 0x50: 46 58 31 30 30 30 30 2d 50 57 52 2d 41 43 00 00
Address 0x60: 00 00 00 00 00 00 01 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff dc ff ff ff ff ff ff ff ff ff ff ff ff
Power Supply 2  REV 02       740-049388      1EDL625039P      Power Supply AC
Jedec Code:     0x7fb0      EEPROM Version: 0x02
P/N:            740-049388   S/N:            1EDL625039P
Assembly ID:    0x0483      Assembly Version: 01.02
Date:           06-19-2016  Assembly Flags:  0x00
Version:        REV 02      CLEI Code:      CMUPADNBAA
ID: QFX10000 AC  FRU Model Number: QFX10000-PWR-AC
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 83 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 34 39 33 38 38 00 00

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```

Address 0x20: 31 45 44 4c 36 32 35 30 33 39 50 00 00 13 06 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 50 41 44 4e 42 41 41 51
Address 0x50: 46 58 31 30 30 30 30 2d 50 57 52 2d 41 43 00 00
Address 0x60: 00 00 00 00 00 00 01 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff dc ff ff ff ff ff ff ff ff ff ff ff
Power Supply 3  REV 02  740-049388  1EDL702004E  Power Supply AC
Jedec Code: 0x7fb0  EEPROM Version: 0x02
P/N: 740-049388  S/N: 1EDL702004E
Assembly ID: 0x0483  Assembly Version: 01.02
Date: 01-18-2017  Assembly Flags: 0x00
Version: REV 02  CLEI Code: CMUPADNBAA
ID: QFX10000 AC  FRU Model Number: QFX10000-PWR-AC
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 83 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 34 39 33 38 38 00 00
Address 0x20: 31 45 44 4c 37 30 32 30 30 34 45 00 00 12 01 07
Address 0x30: e1 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 50 41 44 4e 42 41 41 51
Address 0x50: 46 58 31 30 30 30 30 2d 50 57 52 2d 41 43 00 00
Address 0x60: 00 00 00 00 00 00 01 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff dc ff ff ff ff ff ff ff ff ff ff ff
Power Supply 4  REV 02  740-049388  1EDL625039D  Power Supply AC
Jedec Code: 0x7fb0  EEPROM Version: 0x02
P/N: 740-049388  S/N: 1EDL625039D
Assembly ID: 0x0483  Assembly Version: 01.02
Date: 06-19-2016  Assembly Flags: 0x00
Version: REV 02  CLEI Code: CMUPADNBAA
ID: QFX10000 AC  FRU Model Number: QFX10000-PWR-AC
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 83 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 34 39 33 38 38 00 00
Address 0x20: 31 45 44 4c 36 32 35 30 33 39 44 00 00 13 06 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 50 41 44 4e 42 41 41 51
Address 0x50: 46 58 31 30 30 30 30 2d 50 57 52 2d 41 43 00 00
Address 0x60: 00 00 00 00 00 00 01 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff dc ff ff ff ff ff ff ff ff ff ff ff
Power Supply 5  REV 02  740-049388  1EDL63706JD  Power Supply AC
Jedec Code: 0x7fb0  EEPROM Version: 0x02
P/N: 740-049388  S/N: 1EDL63706JD
Assembly ID: 0x0483  Assembly Version: 01.02
Date: 09-13-2016  Assembly Flags: 0x00
Version: REV 02  CLEI Code: CMUPADNBAA
ID: QFX10000 AC  FRU Model Number: QFX10000-PWR-AC
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 83 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 34 39 33 38 38 00 00
Address 0x20: 31 45 44 4c 36 33 37 30 36 4a 44 00 00 0d 09 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 50 41 44 4e 42 41 41 51
Address 0x50: 46 58 31 30 30 30 30 2d 50 57 52 2d 41 43 00 00
Address 0x60: 00 00 00 00 00 00 01 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff dc ff ff ff ff ff ff ff ff ff ff ff

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```

Power Supply 6    REV 02    740-049388    1EDL63706JH    Power Supply AC
Jedec Code:      0x7fb0      EEPROM Version: 0x02
P/N:             740-049388    S/N:           1EDL63706JH
Assembly ID:     0x0483      Assembly Version: 01.02
Date:           09-13-2016    Assembly Flags: 0x00
Version:         REV 02      CLEI Code:     CMUPADNBAA
ID: QFX10000 AC    FRU Model Number: QFX10000-PWR-AC

Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 83 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 34 39 33 38 38 00 00
Address 0x20: 31 45 44 4c 36 33 37 30 36 4a 48 00 00 0d 09 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 50 41 44 4e 42 41 41 51
Address 0x50: 46 58 31 30 30 30 30 2d 50 57 52 2d 41 43 00 00
Address 0x60: 00 00 00 00 00 00 01 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff dc ff ff ff ff ff ff ff ff ff ff ff ff

FTC 0             REV 10    750-050309    ACPM2918    Fan Controller 16
Jedec Code:      0x7fb0      EEPROM Version: 0x02
P/N:             750-050309    S/N:           ACPM2918
Assembly ID:     0x0b9c      Assembly Version: 01.10
Date:           01-13-2017    Assembly Flags: 0x00
Version:         REV 10      CLEI Code:     CMUCAH5CAA
ID: QFX10016 FTC    FRU Model Number: QFX10016-FAN-CTRL

Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 9c 01 0a 52 45 56 20 31 30 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 30 33 30 39 00 00
Address 0x20: 53 2f 4e 20 41 43 50 4d 32 39 31 38 00 0d 01 07
Address 0x30: e1 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 35 43 41 41 51
Address 0x50: 46 58 31 30 30 31 36 2d 46 41 4e 2d 43 54 52 4c
Address 0x60: 00 00 00 00 00 00 41 41 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 6f ff ff ff ff ff ff ff ff ff ff ff ff

FTC 1             REV 10    750-050309    ACPE8185    Fan Controller 16
Jedec Code:      0x7fb0      EEPROM Version: 0x02
P/N:             750-050309    S/N:           ACPE8185
Assembly ID:     0x0b9c      Assembly Version: 01.10
Date:           12-22-2016    Assembly Flags: 0x00
Version:         REV 10      CLEI Code:     CMUCAH5CAA
ID: QFX10016 FTC    FRU Model Number: QFX10016-FAN-CTRL

Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 9c 01 0a 52 45 56 20 31 30 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 30 33 30 39 00 00
Address 0x20: 53 2f 4e 20 41 43 50 45 38 31 38 35 00 16 0c 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 35 43 41 41 51
Address 0x50: 46 58 31 30 30 31 36 2d 46 41 4e 2d 43 54 52 4c
Address 0x60: 00 00 00 00 00 00 41 41 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 6f ff ff ff ff ff ff ff ff ff ff ff ff

Fan Tray 0        REV 10    760-077141    ACPV7288    Fan Tray 16
Jedec Code:      0x7fb0      EEPROM Version: 0x02
P/N:             760-077141    S/N:           ACPV7288
Assembly ID:     0x0bf1      Assembly Version: 01.10
Date:           06-07-2017    Assembly Flags: 0x00
Version:         REV 10      CLEI Code:     CMUCAH4CAA

```



```

ID: QFX10016 FHB                      FRU Model Number: JNP10016-FAN
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b f1 01 0a 52 45 56 20 31 30 00 00
Address 0x10: 00 00 00 00 37 36 30 2d 30 37 37 31 34 31 00 00
Address 0x20: 53 2f 4e 20 41 43 50 56 37 32 38 38 00 07 06 07
Address 0x30: e1 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 34 43 41 41 4a
Address 0x50: 4e 50 31 30 30 31 36 2d 46 41 4e 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 41 42 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 0d ff ff ff ff ff ff ff ff ff ff ff ff
Fan Tray 1          REV 10    760-057901    ACPL0546          Fan Tray 16
Jedec Code: 0x7fb0          EEPROM Version: 0x02
P/N: 760-057901          S/N: ACPL0546
Assembly ID: 0x0bf1        Assembly Version: 01.10
Date: 02-14-2017          Assembly Flags: 0x00
Version: REV 10          CLEI Code: CMUCAH4CAA
ID: QFX10016 FHB          FRU Model Number: QFX10016-FAN
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b f1 01 0a 52 45 56 20 31 30 00 00
Address 0x10: 00 00 00 00 37 36 30 2d 30 35 37 39 30 31 00 00
Address 0x20: 53 2f 4e 20 41 43 50 4c 30 35 34 36 00 0e 02 07
Address 0x30: e1 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 34 43 41 41 51
Address 0x50: 46 58 31 30 30 31 36 2d 46 41 4e 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 41 42 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 0d ff ff ff ff ff ff ff ff ff ff ff ff
SIB 0              REV 15    750-058270    ACPM2804          Switch Fabric 16
Jedec Code: 0x7fb0          EEPROM Version: 0x02
P/N: 750-058270          S/N: ACPM2804
Assembly ID: 0x0bed        Assembly Version: 01.15
Date: 12-21-2016          Assembly Flags: 0x00
Version: REV 15          CLEI Code: CMUCAH6CAA
ID: QFX10016 SIB          FRU Model Number: QFX10016-SF
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b ed 01 0f 52 45 56 20 31 35 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 38 32 37 30 00 00
Address 0x20: 53 2f 4e 20 41 43 50 4d 32 38 30 34 00 15 0c 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 36 43 41 41 51
Address 0x50: 46 58 31 30 30 31 36 2d 53 46 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 41 42 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff d3 00 00 00 00 00 00 00 00 00 00 00 00
SIB 1              REV 15    750-058270    ACPM2808          Switch Fabric 16
Jedec Code: 0x7fb0          EEPROM Version: 0x02
P/N: 750-058270          S/N: ACPM2808
Assembly ID: 0x0bed        Assembly Version: 01.15
Date: 12-21-2016          Assembly Flags: 0x00
Version: REV 15          CLEI Code: CMUCAH6CAA
ID: QFX10016 SIB          FRU Model Number: QFX10016-SF
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b ed 01 0f 52 45 56 20 31 35 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 38 32 37 30 00 00

```

```

Address 0x20: 53 2f 4e 20 41 43 50 4d 32 38 30 38 00 15 0c 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 36 43 41 41 51
Address 0x50: 46 58 31 30 30 31 36 2d 53 46 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 41 42 00 ff ff ff ff ff ff
Address 0x70: ff ff ff d3 00 00 00 00 00 00 00 00 00 00 00
SIB 2          REV 15    750-058270    ACPL4450          Switch Fabric 16
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-058270      S/N:              ACPL4450
Assembly ID:   0x0bed          Assembly Version:  01.15
Date:          02-17-2017      Assembly Flags:    0x00
Version:       REV 15          CLEI Code:         CMUCAH6CAA
ID: QFX10016 SIB              FRU Model Number: QFX10016-SF
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b ed 01 0f 52 45 56 20 31 35 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 38 32 37 30 00 00
Address 0x20: 53 2f 4e 20 41 43 50 4c 34 34 35 30 00 11 02 07
Address 0x30: e1 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 36 43 41 41 51
Address 0x50: 46 58 31 30 30 31 36 2d 53 46 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 41 42 00 ff ff ff ff ff ff
Address 0x70: ff ff ff d3 00 00 00 00 00 00 00 00 00 00 00
SIB 3          REV 15    750-058270    ACPJ9834          Switch Fabric 16
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-058270      S/N:              ACPJ9834
Assembly ID:   0x0bed          Assembly Version:  01.15
Date:          12-17-2016      Assembly Flags:    0x00
Version:       REV 15          CLEI Code:         CMUCAH6CAA
ID: QFX10016 SIB              FRU Model Number: QFX10016-SF
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b ed 01 0f 52 45 56 20 31 35 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 38 32 37 30 00 00
Address 0x20: 53 2f 4e 20 41 43 50 4a 39 38 33 34 00 11 0c 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 36 43 41 41 51
Address 0x50: 46 58 31 30 30 31 36 2d 53 46 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 41 42 00 ff ff ff ff ff ff
Address 0x70: ff ff ff d3 00 00 00 00 00 00 00 00 00 00 00
SIB 4          REV 15    750-058270    ACPM2814          Switch Fabric 16
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-058270      S/N:              ACPM2814
Assembly ID:   0x0bed          Assembly Version:  01.15
Date:          12-21-2016      Assembly Flags:    0x00
Version:       REV 15          CLEI Code:         CMUCAH6CAA
ID: QFX10016 SIB              FRU Model Number: QFX10016-SF
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b ed 01 0f 52 45 56 20 31 35 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 38 32 37 30 00 00
Address 0x20: 53 2f 4e 20 41 43 50 4d 32 38 31 34 00 15 0c 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 36 43 41 41 51
Address 0x50: 46 58 31 30 30 31 36 2d 53 46 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 41 42 00 ff ff ff ff ff ff
Address 0x70: ff ff ff d3 00 00 00 00 00 00 00 00 00 00 00

```

```

SIB 5          REV 15    750-058270    ACPL4277          Switch Fabric 16
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-058270      S/N:              ACPL4277
Assembly ID:   0x0bed          Assembly Version:  01.15
Date:          02-17-2017      Assembly Flags:    0x00
Version:       REV 15          CLEI Code:         CMUCAH6CAA
ID: QFX10016 SIB              FRU Model Number:  QFX10016-SF

Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b ed 01 0f 52 45 56 20 31 35 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 38 32 37 30 00 00
Address 0x20: 53 2f 4e 20 41 43 50 4c 34 32 37 37 00 11 02 07
Address 0x30: e1 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 36 43 41 41 51
Address 0x50: 46 58 31 30 30 31 36 2d 53 46 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 41 42 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff d3 00 00 00 00 00 00 00 00 00 00 00 00

FPD Board      REV 07    711-054687    ACPL1407          Front Panel Display
Jedec Code:    0x7fb0          EEPROM Version:    0x01
P/N:           711-054687      S/N:              ACPL1407
Assembly ID:   0x0bf2          Assembly Version:  01.07
Date:          02-12-2017      Assembly Flags:    0x00
Version:       REV 07
ID: QFX10000 FPD

Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 0b f2 01 07 52 45 56 20 30 37 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 35 34 36 38 37 00 00
Address 0x20: 53 2f 4e 20 41 43 50 4c 31 34 30 37 00 0c 02 07
Address 0x30: e1 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff

```

### show chassis hardware models (MX104 Router)

```
user@host> show chassis hardware models
```

```

Hardware inventory:
Item          Version  Part number  Serial number  FRU model number
Midplane      REV 20    750-044219   CAAS5849       PROTO-ASSEMBLY
PEM 0         REV 01    740-045932   1H072400065
Routing Engine 0 REV 16    750-044228   CAAR5915       PROTO-ASSEMBLY
AFEB 0
FPC 0         BUILTIN   BUILTIN
FPC 1         BUILTIN   BUILTIN
MIC 0         REV 01    750-046905   CAAK7103       MIC-3D-20GE-SFP-EH
FPC 2         BUILTIN   BUILTIN
Fan Tray      REV 02    711-049570   CAAX6538       PROTO-ASSEMBLY

```

### show chassis hardware models (PTX10008 Router)

```
user@host> show chassis hardware models
```

```

Hardware inventory:
Item          Version  Part number  Serial number  FRU model number

```

Midplane	REV 27	750-054097	ACPD4307	QFX10008-CHAS
CB 0	REV 02	750-068820	ACNZ4440	QFX10000-RE
CB 1	REV 02	750-068820	ACNZ8284	QFX10000-RE
FPC 0	REV 36	750-051354	ACNP4679	QFX10000-36Q
PIC 0		BUILTIN	BUILTIN	
FPC 1	REV 33	750-051354	ACNX8831	QFX10000-36Q
PIC 0		BUILTIN	BUILTIN	
FPC 2	REV 32	750-051357	ACPB0341	QFX10000-30C
PIC 0		BUILTIN	BUILTIN	
FPC 3	REV 35	750-051357	ACPD2186	QFX10000-30C
PIC 0		BUILTIN	BUILTIN	
FPC 5	REV 08	750-068822	ACPF0057	QFX10000-36Q
PIC 0		BUILTIN	BUILTIN	
FPC 6	REV 08	750-068822	ACPE9951	QFX10000-36Q
PIC 0		BUILTIN	BUILTIN	
FPD Board	REV 07	711-054687	ACPC7142	
Power Supply 0	REV 02	740-049388	1EDL62102N9	QFX10000-PWR-AC
Power Supply 1	REV 02	740-049388	1EDL60300KX	QFX10000-PWR-AC
Power Supply 2	REV 02	740-049388	1EDL60300DL	QFX10000-PWR-AC
Power Supply 3	REV 02	740-049388	1EDL61701BT	QFX10000-PWR-AC
Power Supply 4	REV 02	740-049388	1EDL62102P7	QFX10000-PWR-AC
Power Supply 5	REV 02	740-049388	1EDL62102PP	QFX10000-PWR-AC
FTC 0	REV 14	750-050108	ACPE4038	QFX10008-FAN-CTRL
FTC 1	REV 14	750-050108	ACPE4032	QFX10008-FAN-CTRL
Fan Tray 0	REV 09	760-054372	ACPD6799	QFX10008-FAN
Fan Tray 1	REV 09	760-054372	ACNZ3584	QFX10008-FAN
SIB 0	REV 24	750-050058	ACPD4587	QFX10008-SF
SIB 1	REV 24	750-050058	ACNZ0635	QFX10008-SF
SIB 2	REV 24	750-050058	ACPD4908	QFX10008-SF
SIB 3	REV 24	750-050058	ACNZ0617	QFX10008-SF
SIB 4	REV 24	750-050058	ACNZ0527	QFX10008-SF
SIB 5	REV 23	750-050058	ACNX6980	QFX10008-SF

### show chassis hardware models (PTX10016 Router)

```
user@host> show chassis hardware models
```

Hardware inventory:

Item	Version	Part number	Serial number	FRU model number
Midplane	REV 24	750-077138	ACPR5157	JNP10016
CB 0	REV 04	711-065897	CAHA9983	PROTO-ASSEMBLY
CB 1	REV 05	711-065897	CAJD3802	PROTO-ASSEMBLY
FPC 2				
PIC 0		BUILTIN	BUILTIN	
FPC 4	REV 35	750-071976	ACPD2168	JNP10K-LC1101
PIC 0		BUILTIN	BUILTIN	
FPC 5	REV 13	750-068822	ACPA0336	JNP10K-LC1101
PIC 0		BUILTIN	BUILTIN	
FPC 6	REV 41	750-071976	ACPF0695	JNP10K-LC1101
PIC 0		BUILTIN	BUILTIN	
FPC 7	REV 35	750-071976	ACPD2139	JNP10K-LC1101
PIC 0		BUILTIN	BUILTIN	
FPC 8	REV 35	750-071976	ACPD2142	JNP10K-LC1101
PIC 0		BUILTIN	BUILTIN	
FPC 9	REV 41	750-071976	ACPM5461	JNP10K-LC1101
PIC 0		BUILTIN	BUILTIN	
FPC 10	REV 35	750-071976	ACNS6795	JNP10K-LC1101
PIC 0		BUILTIN	BUILTIN	
FPC 11	REV 35	750-071976	ACPD1831	JNP10K-LC1101
PIC 0		BUILTIN	BUILTIN	

FPC 13	REV 41	750-071976	ACPS2075	JNP10K-LC1101
PIC 0		BUILTIN	BUILTIN	
FPC 15	REV 37	750-071976	ACPL7163	JNP10K-LC1101
PIC 0		BUILTIN	BUILTIN	
Power Supply 0	REV 01	740-073147	1EDM6171155	JNP10K-PWR-DC
Power Supply 1	REV 01	740-073147	1EDM6281575	JNP10K-PWR-DC
Power Supply 2	REV 01	740-073147	1EDM6171044	JNP10K-PWR-DC
Power Supply 3	REV 01	740-073147	1EDM6281244	JNP10K-PWR-DC
Power Supply 4	REV 01	740-073147	1EDM6282093	JNP10K-PWR-DC
Power Supply 5	REV 01	740-073147	1EDM6281413	JNP10K-PWR-DC
Power Supply 6	REV 01	740-073147	1EDM6171071	JNP10K-PWR-DC
Power Supply 7	REV 01	740-073147	1EDM6170709	JNP10K-PWR-DC
Power Supply 8	REV 01	740-073147	1EDM6171169	JNP10K-PWR-DC
Power Supply 9	REV 01	740-073147	1EDM6170754	JNP10K-PWR-DC
Fan Tray 0				QFX5100-FAN-AFO
Fan Tray 1				QFX5100-FAN-AFO
SIB 0	REV 15	750-077140	ACPV3933	JNP10016-SF
SIB 1	REV 15	750-077140	ACPV3938	JNP10016-SF
SIB 2	REV 15	750-077140	ACPV3974	JNP10016-SF
SIB 3	REV 15	750-077140	ACPV3879	JNP10016-SF
SIB 4	REV 15	750-077140	ACPV3964	JNP10016-SF
SIB 5	REV 15	750-077140	ACPV3981	JNP10016-SF
FPD Board	REV 07	711-054687	ACPS8855	

#### show chassis hardware clei-models (MX104 Router)

```
user@host> show chassis hardware clei-models
```

Hardware inventory:

Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 20	750-044219	PROTOXCLEI	PROTO-ASSEMBLY
PEM 0	REV 01	740-045932		
Routing Engine 0	REV 16	750-044228	PROTOXCLEI	PROTO-ASSEMBLY
AFEB 0		BUILTIN		
FPC 0		BUILTIN		
FPC 1		BUILTIN		
MIC 0	REV 01	750-046905	PROTOXCLEI	MIC-3D-20GE-SFP-EH
FPC 2		BUILTIN		
Fan Tray	REV 02	711-049570	CAAX6538	PROTO-ASSEMBLY

#### show chassis hardware (MX240 Router)

```
user@host> show chassis hardware
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN10C7F7EAFC	MX240
Midplane	REV 01	710-021041	TR1502	MX240 Backplane
FPM Board	REV 01	710-017254	KD4017	Front Panel Display
PEM 0	Rev 02	740-017330	000332	PS 1.2-1.7kW; 100-240V
AC in				
PEM 1	Rev 02	740-017330	000226	PS 1.2-1.7kW; 100-240V
AC in				
Routing Engine 0	REV 06	740-013063	1000703522	RE-S-2000
Routing Engine 1	REV 06	740-015113	1000687625	RE-S-1300
CB 0	REV 07	710-013385	KC9057	MX SCB
CB 1	REV 05	710-013385	JY4760	MX SCB
FPC 1	REV 01	750-021679	KC7340	DPCE 40x 1GE R
CPU	REV 06	710-013713	KD4078	DPC PMB

PIC 0			BUILTIN	BUILTIN	10x 1GE(LAN)
Xcvr 0	REV 01	740-011613	P9F18ME		SFP-SX
PIC 1			BUILTIN	BUILTIN	10x 1GE(LAN)
PIC 2			BUILTIN	BUILTIN	10x 1GE(LAN)
PIC 3			BUILTIN	BUILTIN	10x 1GE(LAN)
FPC 2	REV 04	710-016669	JS4529		DPCE 40x 1GE R EQ
CPU	REV 06	710-013713	KB3969		DPC PMB
PIC 0			BUILTIN	BUILTIN	10x 1GE(LAN) EQ
Xcvr 0	REV 01	740-011613	PBG3Y79		SFP-SX
Xcvr 1	REV 01	740-011613	PBG3XU8		SFP-SX
Xcvr 2	REV 01	740-011613	PBG3YG6		SFP-SX
Xcvr 3	REV 01	740-011613	PBG3XUG		SFP-SX
Xcvr 4	REV 01	740-011613	PBG3XTJ		SFP-SX
PIC 1			BUILTIN	BUILTIN	10x 1GE(LAN) EQ
Xcvr 0	REV 01	740-011613	PBG3ZUM		SFP-SX
Xcvr 1	REV 01	740-011613	PBG3Y5H		SFP-SX
Xcvr 2	REV 01	740-011613	PBG3UZT		SFP-SX
Xcvr 3	REV 01	740-011613	PBG3US1		SFP-SX
PIC 2			BUILTIN	BUILTIN	10x 1GE(LAN) EQ
Xcvr 0	REV 01	740-011613	PBG3YG7		SFP-SX
Xcvr 1	REV 01	740-011613	PBG3XZ9		SFP-SX
Xcvr 2	REV 01	740-011613	PBG3XTY		SFP-SX
Xcvr 3	REV 01	740-011613	PBG3UZG		SFP-SX
PIC 3			BUILTIN	BUILTIN	10x 1GE(LAN) EQ
Xcvr 0	REV 01	740-011613	PBG3Y8W		SFP-SX
Xcvr 1	REV 01	740-011613	PBG3YVX		SFP-SX
Xcvr 2	REV 01	740-011613	PBG3YB3		SFP-SX
Xcvr 3	REV 01	740-011613	PBG43VQ		SFP-SX
Fan Tray 0	REV 01	710-021113	JS4642		MX240 Fan Tray

### show chassis hardware detail (MX 240 Router with Routing Engine Displaying DIMM Information)

```
user@host> show chassis hardware detail
```

Item	Version	Part number	Serial number	Description
Chassis			JN11279B4AFC	MX240 Backplane
Midplane	REV 07	760-021404	TS2474	MX240 Backplane
FPM Board	REV 03	760-021392	XC2643	Front Panel Display
PEM 0	Rev 03	740-017343	QCS0908A068	DC Power Entry Module
Routing Engine 0	REV 01	740-031117	AARCH00	RE-S-1800x4
ad0	3764 MB	STEC M2+ CF 9.0.2	STIM2Q3209239145303	Removable Compact Flash
ad1	28626 MB	WDC SSD-F0030S-5000	C933Z036237215548S00	Compact Flash
usb0 (addr 1)	EHCI root hub 0		Intel	uhub0
usb0 (addr 2)	product 0x0020 32		vendor 0x8087	uhub1
DIMM 0	VL31B5263E-F8S DIE REV-0 PCB REV-0			MFR ID-ce80
DIMM 1	VL31B5263E-F8S DIE REV-0 PCB REV-0			MFR ID-ce80
DIMM 2	VL31B5263E-F8S DIE REV-0 PCB REV-0			MFR ID-ce80
DIMM 3	SL31B5263E-F8S DIE REV-0 PCB REV-0			MFR ID-ce80
CB 0	REV 03	710-021523	XD7225	MX SCB
Fan Tray 0	REV 01	710-021113	WZ4986	MX240 Fan Tray

### show chassis hardware (MX240 Router with Enhanced MX SCB)

```
user@host> show chassis hardware
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
------	---------	-------------	---------------	-------------

Chassis			JN10C7F7EAFB	MX240
Midplane	REV 01	710-021041	TR1502	MX240 Backplane
FPM Board	REV 01	710-017254	KD4017	Front Panel Display
PEM 0	Rev 02	740-017330	000332	PS 1.2-1.7kW; 100-240V
AC in				
PEM 1	Rev 02	740-017330	000226	PS 1.2-1.7kW; 100-240V
AC in				
Routing Engine 0	REV 06	740-013063	1000703522	RE-S-2000
Routing Engine 1	REV 06	740-015113	1000687625	RE-S-1300
CB 0	REV 02	710-031391	YE8494	Enhanced MX SCB
CB 1	REV 05	710-031391	YOP5764	Enhanced MX SCB
FPC 1	REV 01	750-021679	KC7340	DPCE 40x 1GE R
CPU	REV 06	710-013713	KD4078	DPC PMB
PIC 0		BUILTIN	BUILTIN	10x 1GE(LAN)
Xcvr 0	REV 01	740-011613	P9F18ME	SFP-SX
PIC 1		BUILTIN	BUILTIN	10x 1GE(LAN)
PIC 2		BUILTIN	BUILTIN	10x 1GE(LAN)
PIC 3		BUILTIN	BUILTIN	10x 1GE(LAN)
FPC 2	REV 04	710-016669	JS4529	DPCE 40x 1GE R EQ
CPU	REV 06	710-013713	KB3969	DPC PMB
PIC 0		BUILTIN	BUILTIN	10x 1GE(LAN) EQ
Xcvr 0	REV 01	740-011613	PBG3Y79	SFP-SX
Xcvr 1	REV 01	740-011613	PBG3XU8	SFP-SX
Xcvr 2	REV 01	740-011613	PBG3YG6	SFP-SX
Xcvr 3	REV 01	740-011613	PBG3XUG	SFP-SX
Xcvr 4	REV 01	740-011613	PBG3XTJ	SFP-SX
PIC 1		BUILTIN	BUILTIN	10x 1GE(LAN) EQ
Xcvr 0	REV 01	740-011613	PBG3ZUM	SFP-SX
Xcvr 1	REV 01	740-011613	PBG3Y5H	SFP-SX
Xcvr 2	REV 01	740-011613	PBG3UZT	SFP-SX
Xcvr 3	REV 01	740-011613	PBG3US1	SFP-SX
PIC 2		BUILTIN	BUILTIN	10x 1GE(LAN) EQ
Xcvr 0	REV 01	740-011613	PBG3YG7	SFP-SX
Xcvr 1	REV 01	740-011613	PBG3XZ9	SFP-SX
Xcvr 2	REV 01	740-011613	PBG3XTY	SFP-SX
Xcvr 3	REV 01	740-011613	PBG3UZG	SFP-SX
PIC 3		BUILTIN	BUILTIN	10x 1GE(LAN) EQ
Xcvr 0	REV 01	740-011613	PBG3Y8W	SFP-SX
Xcvr 1	REV 01	740-011613	PBG3YVX	SFP-SX
Xcvr 2	REV 01	740-011613	PBG3YB3	SFP-SX
Xcvr 3	REV 01	740-011613	PBG43VQ	SFP-SX
Fan Tray 0	REV 01	710-021113	JS4642	MX240 Fan Tray

### show chassis hardware (MX480 Router)

```
user@host> show chassis hardware
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN10C7F7FAFB	MX480
Midplane	REV 04	710-017414	TR2071	MX480 Midplane
FPM Board	REV 02	710-017254	KB8459	Front Panel Display
PEM 0	Rev 02	740-017330	QCS07519029	PS 1.2-1.7kW; 100-240V
AC in				
PEM 1	Rev 02	740-017330	QCS07519041	PS 1.2-1.7kW; 100-240V
AC in				
PEM 2	Rev 02	740-017330	QCS07519097	PS 1.2-1.7kW; 100-240V
AC in				
Routing Engine 0	REV 07	740-013063	1000733381	RE-S-2000
Routing Engine 1	REV 07	740-013063	1000733540	RE-S-2000

CB 0	REV 07	710-013385	KA8022	MX SCB
CB 1	REV 07	710-013385	KA8303	MX SCB
FPC 0	REV 09	750-020452	KA8660	DPCE 40x 1GE X EQ
CPU	REV 06	710-013713	KA8185	DPC PMB
PIC 0		BUILTIN	BUILTIN	10x 1GE(LAN) EQ
PIC 1		BUILTIN	BUILTIN	10x 1GE(LAN) EQ
PIC 2		BUILTIN	BUILTIN	10x 1GE(LAN) EQ
PIC 3		BUILTIN	BUILTIN	10x 1GE(LAN) EQ
Fan Tray				Left Fan Tray

### show chassis hardware (MX480 Router with Enhanced MX SCB)

```
user@host> show chassis hardware
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN10C7F7FAFB	MX480
Midplane	REV 04	710-017414	TR2071	MX480 Midplane
FPM Board	REV 02	710-017254	KB8459	Front Panel Display
PEM 0	Rev 02	740-017330	QCS07519029	PS 1.2-1.7kW; 100-240V
AC in				
PEM 1	Rev 02	740-017330	QCS07519041	PS 1.2-1.7kW; 100-240V
AC in				
PEM 2	Rev 02	740-017330	QCS07519097	PS 1.2-1.7kW; 100-240V
AC in				
Routing Engine 0	REV 07	740-013063	1000733381	RE-S-2000
Routing Engine 1	REV 07	740-013063	1000733540	RE-S-2000
CB 0	REV 07	710-013385	KA8022	Enhanced MX SCB
CB 1	REV 07	710-013385	KA8303	Enhanced MX SCB
FPC 0	REV 09	750-020452	KA8660	DPCE 40x 1GE X EQ
CPU	REV 06	710-013713	KA8185	DPC PMB
PIC 0		BUILTIN	BUILTIN	10x 1GE(LAN) EQ
PIC 1		BUILTIN	BUILTIN	10x 1GE(LAN) EQ
PIC 2		BUILTIN	BUILTIN	10x 1GE(LAN) EQ
PIC 3		BUILTIN	BUILTIN	10x 1GE(LAN) EQ
Fan Tray				Left Fan Tray

### show chassis hardware (MX480 Routers with MPC5E and Built-In OTN PIC)

```
user@host> show chassis hardware
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN11C0338AFB	MX480
Midplane	REV 05	710-017414	ABAB8430	MX480 Midplane
FPM Board	REV 02	710-017254	ZS8005	Front Panel Display
PEM 0	Rev 05	740-029970	QCS1024U089	PS 1.4-2.52kW; 90-264V
AC in				
PEM 1	Rev 10	740-029970	QCS1314U0FJ	PS 1.4-2.52kW; 90-264V
AC in				
PEM 2	Rev 07	740-029970	QCS1121U076	PS 1.4-2.52kW; 90-264V
AC in				
Routing Engine 0	REV 05	740-031116	9009092471	RE-S-1800x4
Routing Engine 1	REV 05	740-031116	9009097958	RE-S-1800x4
CB 0	REV 16	750-031391	CAAX0789	Enhanced MX SCB
CB 1	REV 16	750-031391	CAAX0856	Enhanced MX SCB
FPC 0	REV 32	750-028467	ABBP1782	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBP5410	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+



Xcvr 0	REV 01	740-021308	983152A00038	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11F00211	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AQ72LPB	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AHNOWR5	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	B11J03627	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11F00300	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AQ42WSS	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQ43HGC	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	ANAONDO	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	ANAONGF	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	ANAONG9	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	ANAOMP9	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	AQA06CG	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	19T511100493	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	APR040J	SFP+-10G-SR
FPC 1	REV 26	750-046005	CACN1894	MPC5E 3D Q 2CGE+4XGE
CPU	REV 09	711-045719	CACN8698	RMPC PMB
PIC 0		BUILTIN	BUILTIN	2X10GE SFPP OTN
Xcvr 0	REV 01	740-031980	163363A03046	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AJ40JS8	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	1X100GE CFP2 OTN
PIC 2		BUILTIN	BUILTIN	2X10GE SFPP OTN
Xcvr 0	REV 01	740-031980	153363A00593	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AJ40JUJ	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	1X100GE CFP2 OTN
Xcvr 0		NON-JNPR	UQCOB53	CFP2-100G-LR4-D
FPC 2	REV 26	750-046005	CACN1891	MPC5E 3D Q 2CGE+4XGE
CPU	REV 09	711-045719	CACN8694	RMPC PMB
PIC 0		BUILTIN	BUILTIN	2X10GE SFPP OTN
Xcvr 0		NON-JNPR	URA012A	SFP+-10G-LR
PIC 1		BUILTIN	BUILTIN	1X100GE CFP2 OTN
Xcvr 0		NON-JNPR	J13F47042	CFP2-100G-LR4-D
PIC 2		BUILTIN	BUILTIN	2X10GE SFPP OTN
Xcvr 0	REV 01	740-031980	AJCOBM3	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	11T511100917	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	1X100GE CFP2 OTN
Xcvr 0		NON-JNPR	UQK07SU	CFP2-100G-LR4-D
FPC 3	REV 03	750-045372	CAAD9425	MPCE Type 3 3D
CPU	REV 08	711-035209	CAAD9094	HMPC PMB 2G
MIC 0	REV 14	750-033196	CAAW9204	1X100GE CXP
PIC 0		BUILTIN	BUILTIN	1X100GE CXP
Xcvr 0	REV 01	740-046563	XD16FC034	CFP2-100G-SR10
MIC 1	REV 19	750-033199	CAAJ1814	1X100GE CFP
PIC 2		BUILTIN	BUILTIN	1X100GE CFP
FPC 4	REV 21.0.11	750-045715	CAAY3568	MPC5E 3D Q 24XGE+6XLGE
CPU	REV 07	711-045719	CAAW7430	RMPC PMB
PIC 0		BUILTIN	BUILTIN	12X10GE SFPP OTN
Xcvr 0	REV 01	740-031980	AP406NG	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AR41NLP	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B11D05630	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	12X10GE SFPP OTN
PIC 2		BUILTIN	BUILTIN	3X40GE QSFPP
PIC 3		BUILTIN	BUILTIN	3X40GE QSFPP
WAN MEZZ	REV 12	750-049136	CACM6678	MPC5E 24XGE OTN Mezz
FPC 5	REV 11	750-045372	CABK7539	MPCE Type 3 3D
CPU	REV 08	711-035209	CABJ2466	HMPC PMB 2G
MIC 0	REV 19	750-033199	CAAJ9719	1X100GE CFP

PIC 0			BUILTIN	BUILTIN	1X100GE CFP
Xcvr 0	REV 01	740-035329	UP1020P		CFP-100G-SR10
MIC 1	REV 07	750-033196	YZ0797		1X100GE CXP
PIC 2			BUILTIN	BUILTIN	1X100GE CXP
Xcvr 0	REV 01	740-046563	XC42FC022		CFP2-100G-SR10
Fan Tray					Enhanced Left Fan Tray

### show chassis hardware detail (MX480 Routers with MPC5E and Built-In OTN PIC)

```
user@host> show chassis hardware detail
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN11C0338AFB	MX480
Midplane	REV 05	710-017414	ABAB8430	MX480 Midplane
FPM Board	REV 02	710-017254	ZS8005	Front Panel Display
PEM 0	Rev 05	740-029970	QCS1024U089	PS 1.4-2.52kW; 90-264V
AC in				
PEM 1	Rev 10	740-029970	QCS1314U0FJ	PS 1.4-2.52kW; 90-264V
AC in				
PEM 2	Rev 07	740-029970	QCS1121U076	PS 1.4-2.52kW; 90-264V
AC in				
Routing Engine 0	REV 05	740-031116	9009092471	RE-S-1800x4
ad0 3896 MB	VRFCF14096DIHK1		VM4096MB 6862	Compact Flash
ad1 30533 MB	UGB94ARF32H0S3-KC		UNIGEN-478612-001127	Disk 1
usb0 (addr 1)	EHCI root hub 0		Intel	uhub0
usb0 (addr 2)	product 0x0020 32		vendor 0x8087	uhub1
DIMM 0	SGU04G72H1BB2SA-BB DIE	REV-52 PCB REV-54	MFR ID-ce80	
DIMM 1	SGU04G72H1BB2SA-BB DIE	REV-52 PCB REV-54	MFR ID-ce80	
DIMM 2	SGU04G72H1BB2SA-BB DIE	REV-52 PCB REV-54	MFR ID-ce80	
DIMM 3	SGU04G72H1BB2SA-BB DIE	REV-52 PCB REV-54	MFR ID-ce80	
Routing Engine 1	REV 05	740-031116	9009097958	RE-S-1800x4
ad0 3896 MB	VRFCF14096DIHK1		VM4096MB 6145	Compact Flash
ad1 30533 MB	UGB94ARF32H0S3-KC		UNIGEN-499551-000273	Disk 1
CB 0	REV 16	750-031391	CAAX0789	Enhanced MX SCB
CB 1	REV 16	750-031391	CAAX0856	Enhanced MX SCB
FPC 0	REV 32	750-028467	ABBP1782	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBP5410	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	983152A00038	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11F00211	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AQ72LPB	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AHNRW5	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	B11J03627	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11F00300	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AQ42WSS	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQ43HGC	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	ANAONDO	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	ANAONGF	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	ANAONG9	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	ANAOMP9	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	AQA06CG	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	19T511100493	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	APR040J	SFP+-10G-SR
FPC 1	REV 26	750-046005	CACN1894	MPC5E 3D Q 2CGE+4XGE
CPU	REV 09	711-045719	CACN8698	RMPC PMB
PIC 0		BUILTIN	BUILTIN	2X10GE SFPP OTN

Xcvr 0	REV 01	740-031980	163363A03046	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AJ40JS8	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	1X100GE CFP2 OTN
PIC 2		BUILTIN	BUILTIN	2X10GE SFPP OTN
Xcvr 0	REV 01	740-031980	153363A00593	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AJ40JUJ	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	1X100GE CFP2 OTN
Xcvr 0		NON-JNPR	UQCOB53	CFP2-100G-LR4-D
FPC 2	REV 26	750-046005	CACN1891	MPC5E 3D Q 2CGE+4XGE
CPU	REV 09	711-045719	CACN8694	RMPD PMB
PIC 0		BUILTIN	BUILTIN	2X10GE SFPP OTN
Xcvr 0		NON-JNPR	URA012A	SFP+-10G-LR
PIC 1		BUILTIN	BUILTIN	1X100GE CFP2 OTN
Xcvr 0		NON-JNPR	J13F47042	CFP2-100G-LR4-D
PIC 2		BUILTIN	BUILTIN	2X10GE SFPP OTN
Xcvr 0	REV 01	740-031980	AJC0BM3	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	11T511100917	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	1X100GE CFP2 OTN
Xcvr 0		NON-JNPR	UQK07SU	CFP2-100G-LR4-D
FPC 3	REV 03	750-045372	CAAD9425	MPCE Type 3 3D
CPU	REV 08	711-035209	CAAD9094	HMPD PMB 2G
MIC 0	REV 14	750-033196	CAAW9204	1X100GE CXP
PIC 0		BUILTIN	BUILTIN	1X100GE CXP
Xcvr 0	REV 01	740-046563	XD16FC034	CFP2-100G-SR10
MIC 1	REV 19	750-033199	CAAJ1814	1X100GE CFP
PIC 2		BUILTIN	BUILTIN	1X100GE CFP
FPC 4	REV 21.0.11	750-045715	CAAY3568	MPC5E 3D Q 24XGE+6XLGE
CPU	REV 07	711-045719	CAAW7430	RMPD PMB
PIC 0		BUILTIN	BUILTIN	12X10GE SFPP OTN
Xcvr 0	REV 01	740-031980	AP406NG	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AR41NLP	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B11D05630	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	12X10GE SFPP OTN
PIC 2		BUILTIN	BUILTIN	3X40GE QSFPP
PIC 3		BUILTIN	BUILTIN	3X40GE QSFPP
WAN MEZZ	REV 12	750-049136	CACM6678	MPC5E 24XGE OTN Mezz
FPC 5	REV 11	750-045372	CABK7539	MPCE Type 3 3D
CPU	REV 08	711-035209	CABJ2466	HMPD PMB 2G
MIC 0	REV 19	750-033199	CAAJ9719	1X100GE CFP
PIC 0		BUILTIN	BUILTIN	1X100GE CFP
Xcvr 0	REV 01	740-035329	UP1020P	CFP-100G-SR10
MIC 1	REV 07	750-033196	YZ0797	1X100GE CXP
PIC 2		BUILTIN	BUILTIN	1X100GE CXP
Xcvr 0	REV 01	740-046563	XC42FC022	CFP2-100G-SR10
Fan Tray				Enhanced Left Fan Tray

### show chassis hardware extensive (MX480 Routers with MPC5E and Built-In OTN PIC)

```
user@host> show chassis hardware extensive
```

#### Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN11C0338AFB	MX480
Jedec Code:	0x7fb0	EEPROM Version:	0x02	
		S/N:	JN11C0338AFB	
Assembly ID:	0x01fe	Assembly Version:	00.00	
Date:	00-00-0000	Assembly Flags:	0x02	
ID:	MX480			
Board Information Record:				

```

Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 7f b0 02 ff 01 fe 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x20: 4a 4e 31 31 43 30 33 33 38 41 46 42 02 00 00 00
Address 0x30: 00 00 00 ff 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane          REV 05    710-017414    ABAB8430          MX480 Midplane
Jedec Code:      0x7fb0          EEPROM Version:    0x01
P/N:             710-017414      S/N:             ABAB8430
Assembly ID:     0x01fe          Assembly Version: 01.05
Date:            12-13-2011      Assembly Flags:   0x00
Version:         REV 05
ID: MX480 Midplane          FRU Model Number: CHAS-BP-MX480-S
Board Information Record:
Address 0x00: ad 01 08 00 00 23 9c fc 98 00 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 01 fe 01 05 52 45 56 20 30 35 00 00
Address 0x10: 00 00 00 00 37 31 30 2d 30 31 37 34 31 34 00 00
Address 0x20: 53 2f 4e 20 41 42 41 42 38 34 33 30 00 0d 0c 07
Address 0x30: db ff ff ff ad 01 08 00 00 23 9c fc 98 00 ff ff
Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 43
Address 0x50: 48 41 53 2d 42 50 2d 4d 58 34 38 30 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM Board          REV 02    710-017254    ZS8005          Front Panel Display
Jedec Code:      0x7fb0          EEPROM Version:    0x01
P/N:             710-017254      S/N:             ZS8005
Assembly ID:     0x01ff          Assembly Version: 01.02
Date:            11-21-2011      Assembly Flags:   0x00
Version:         REV 02
ID: Front Panel Display          FRU Model Number: CRAFT-MX480-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 01 ff 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 31 30 2d 30 31 37 32 35 34 00 00
Address 0x20: 53 2f 4e 20 5a 53 38 30 30 35 00 00 00 15 0b 07
Address 0x30: db ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 43
Address 0x50: 52 41 46 54 2d 4d 58 34 38 30 2d 53 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
PEM 0              Rev 05    740-029970    QCS1024U089      PS 1.4-2.52kW; 90-264V
AC in
Jedec Code:      0x7fb0          EEPROM Version:    0x01
P/N:             740-029970      S/N:             QCS1024U089
Assembly ID:     0x0432          Assembly Version: 01.05
Date:            06-17-2010      Assembly Flags:   0x00
Version:         Rev 05
ID: PS 1.4-2.52kW; 90-264V AC in FRU Model Number: PWR-MX480-2520-AC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
I2C Hex Data:
Address 0x00: 7f b0 01 ff 04 32 01 05 52 65 76 20 30 35 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 32 39 39 37 30 00 00
Address 0x20: 51 43 53 31 30 32 34 55 30 38 39 00 00 11 06 07

```

```

Address 0x30: da ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 50
Address 0x50: 57 52 2d 4d 58 34 38 30 2d 32 35 32 30 2d 41 43
Address 0x60: 2d 53 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PEM 1          Rev 10   740-029970   QCS1314U0FJ   PS 1.4-2.52kW; 90-264V
AC in
Jedec Code:    0x7fb0          EEPROM Version: 0x01
P/N:           740-029970      S/N:           QCS1314U0FJ
Assembly ID:   0x0432          Assembly Version: 01.10
Date:          04-04-2013      Assembly Flags: 0x00
Version:       Rev 10
ID: PS 1.4-2.52kW; 90-264V AC in FRU Model Number: PWR-MX480-2520-AC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
I2C Hex Data:
Address 0x00: 7f b0 01 ff 04 32 01 0a 52 65 76 20 31 30 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 32 39 39 37 30 00 00
Address 0x20: 51 43 53 31 33 31 34 55 30 46 4a 00 00 04 04 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 50
Address 0x50: 57 52 2d 4d 58 34 38 30 2d 32 35 32 30 2d 41 43
Address 0x60: 2d 53 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PEM 2          Rev 07   740-029970   QCS1121U076   PS 1.4-2.52kW; 90-264V
AC in
Jedec Code:    0x7fb0          EEPROM Version: 0x01
P/N:           740-029970      S/N:           QCS1121U076
Assembly ID:   0x0432          Assembly Version: 01.07
Date:          05-23-2011      Assembly Flags: 0x00
Version:       Rev 07
ID: PS 1.4-2.52kW; 90-264V AC in FRU Model Number: PWR-MX480-2520-AC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
I2C Hex Data:
Address 0x00: 7f b0 01 ff 04 32 01 07 52 65 76 20 30 37 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 32 39 39 37 30 00 00
Address 0x20: 51 43 53 31 31 32 31 55 30 37 36 00 00 17 05 07
Address 0x30: db ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 50
Address 0x50: 57 52 2d 4d 58 34 38 30 2d 32 35 32 30 2d 41 43
Address 0x60: 2d 53 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Routing Engine 0 REV 05   740-031116   9009092471   RE-S-1800x4
Jedec Code:    0x7fb0          EEPROM Version: 0x02
P/N:           740-031116      S/N:           9009092471
Assembly ID:   0x09c0          Assembly Version: 01.05
Date:          11-01-2011      Assembly Flags: 0x00
Version:       REV 05          CLEI Code:     COUCALDBAA
ID: RE-S-1800x4          FRU Model Number: RE-S-1800X4-16G-S
Board Information Record:
Address 0x00: 54 32 30 32 37 43 41 2d 34 32 46 42 23 23 23 00
I2C Hex Data:
Address 0x00: 7f b0 02 ff 09 c0 01 05 52 45 56 20 30 35 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 33 31 31 31 36 00 00
Address 0x20: 39 30 30 39 30 39 32 34 37 31 00 00 00 01 0b 07
Address 0x30: db ff ff ff 54 32 30 32 37 43 41 2d 34 32 46 42
Address 0x40: 23 23 23 00 01 43 4f 55 43 41 4c 44 42 41 41 52
Address 0x50: 45 2d 53 2d 31 38 30 30 58 34 2d 31 36 47 2d 53
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff

```

```

Address 0x70: ff ff ff 4b ff ff ff ff ff ff ff ff ff ff
ad0 3896 MB VRFCF14096DIHK1 VM4096MB 6862 Compact Flash
ad1 30533 MB UGB94ARF32H0S3-KC UNIGEN-478612-001127 Disk 1
usb0 (addr 1) EHCI root hub 0 Intel uhub0
usb0 (addr 2) product 0x0020 32 vendor 0x8087 uhub1
DIMM 0 SGU04G72H1BB2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
DIMM 1 SGU04G72H1BB2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
DIMM 2 SGU04G72H1BB2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
DIMM 3 SGU04G72H1BB2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
Routing Engine 1 REV 05 740-031116 9009097958 RE-S-1800x4
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-031116 S/N: 9009097958
Assembly ID: 0x09c0 Assembly Version: 01.05
Date: 02-06-2012 Assembly Flags: 0x00
Version: REV 05 CLEI Code: COUCALDBAA
ID: RE-S-1800x4 FRU Model Number: RE-S-1800X4-16G-S
Board Information Record:
Address 0x00: 54 32 30 32 37 43 41 2d 34 32 46 42 23 23 23 00
I2C Hex Data:
Address 0x00: 7f b0 02 ff 09 c0 01 05 52 45 56 20 30 35 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 33 31 31 36 00 00
Address 0x20: 39 30 30 39 30 39 37 39 35 38 00 00 06 02 07
Address 0x30: dc ff ff ff 54 32 30 32 37 43 41 2d 34 32 46 42
Address 0x40: 23 23 23 00 01 43 4f 55 43 41 4c 44 42 41 41 52
Address 0x50: 45 2d 53 2d 31 38 30 30 58 34 2d 31 36 47 2d 53
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 4b ff ff ff ff ff ff ff ff ff ff ff
ad0 3896 MB VRFCF14096DIHK1 VM4096MB 6145 Compact Flash
ad1 30533 MB UGB94ARF32H0S3-KC UNIGEN-499551-000273 Disk 1
...

```

### show chassis hardware (MX960 Router)

```
user@host> show chassis hardware
```

```
Hardware inventory:
```

Item	Version	Part number	Serial number	Description
Chassis				MX960
Midplane	REV 01	710-013698	AA6082	MX960 Midplane
PIM	Rev 01	740-013110	000008	Power Inlet Module
PEM 2				
PEM 3	Rev 01	740-013682	000038	PS 1.7kW; 200-240VAC in
Routing Engine 0	REV 00	740-015113	1000617944	RE-S-1300
CB 0	REV 05	710-013725	JK6947	MX960 Test SCB
FPC 4	REV 01	710-013305	JM7617	MX960 Test DPC
CPU				
PIC 0		BUILTIN	BUILTIN	1x 10GE (LAN/WAN)
PIC 1		BUILTIN	BUILTIN	10x 1GE
FPC 7	REV 01	710-013305	JL9634	MX960 Test DPC
CPU				
PIC 0		BUILTIN	BUILTIN	1x 10GE (LAN/WAN)
Xcvr 0		NON-JNPR	MYBG65I82C	XFP-10G-SR
PIC 1		BUILTIN	BUILTIN	10x 1GE
Xcvr 1	REV 01	740-011782	P7N0368	SFP-SX
Xcvr 4	REV 01	740-011782	P8J1W27	SFP-SX
Xcvr 6	REV 01	740-011782	P8J1VSD	SFP-SX
Xcvr 9	REV 01	740-011782	P8J1W25	SFP-SX
Fan Tray 0				
Fan Tray 1				

## show chassis hardware (MX960 Router with Bidirectional Optics)

user@host&gt; show chassis hardware

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN10BA5B9AFA	MX960
Midplane	REV 03	710-013698	TR0234	MX960 Backplane
FPM Board	REV 03	710-014974	JA0878	Front Panel Display
PDM	Rev 03	740-013110	QCS11135028	Power Distribution Module
PEM 0	Rev 03	740-013682	QCS11154036	PS 1.7kW; 200-240VAC in
PEM 1	Rev 03	740-013682	QCS11154010	PS 1.7kW; 200-240VAC in
PEM 2	Rev 03	740-013682	QCS11154022	PS 1.7kW; 200-240VAC in
Routing Engine 0	REV 06	740-013063	1000691458	RE-S-2000
CB 0	REV 07	710-013385	KA2190	MX SCB
CB 1	REV 07	710-013385	KA0837	MX SCB
FPC 3	REV 02	750-018122	KB3890	DPCE 40x 1GE R
CPU				
FPC 4	REV 01	750-018122	KB3889	DPCE 40x 1GE R
CPU	REV 06	710-013713	KB3976	DPC PMB
PIC 0		BUILTIN	BUILTIN	10x 1GE(LAN)
Xcvr 1	REV 01	740-020426	4910549	SFP-1000BASE-BX40-D
Xcvr 2	REV 01	740-020426	4910551	SFP-1000BASE-BX40-D
Xcvr 5	REV 01	740-021340	77E245N00006	SFP-1000BASE-BX10-U
Xcvr 6	REV 01	740-020425	4882821	SFP-1000BASE-BX40-U
Xcvr 8	REV 01	740-020425	4882820	SFP-1000BASE-BX40-U
PIC 1		BUILTIN	BUILTIN	10x 1GE(LAN)
Xcvr 0	REV 01	740-020465	77E555N00894	SFP-1000BASE-BX10-D
Xcvr 1	REV 01	740-020465	75E467X00818	SFP-1000BASE-BX10-D
Xcvr 2	REV 01	740-020465	75E467X00573	SFP-1000BASE-BX10-D
Xcvr 3	REV 01	740-020465	4888227	SFP-1000BASE-BX10-D
Xcvr 4	REV 01	740-020465	4888241	SFP-1000BASE-BX10-D
Xcvr 5	REV 01	740-021340	77E245N00005	SFP-1000BASE-BX10-U
Xcvr 6	REV 01	740-021340	76E245X00487	SFP-1000BASE-BX10-U
Xcvr 7	REV 01	740-021341	5255889	SFP-1000BASE-BX10-U
Xcvr 8	REV 01	740-021341	5255887	SFP-1000BASE-BX10-U
Xcvr 9	REV 01	740-021340	77E245N00004	SFP-1000BASE-BX10-U
PIC 2		BUILTIN	BUILTIN	10x 1GE(LAN)
Xcvr 0	REV 01	740-020424	5007582	SFP-1000BASE-BX10-D
Xcvr 1	REV 01	740-020424	4888187	SFP-1000BASE-BX10-D
Xcvr 2	REV 01	740-020424	4656500	SFP-1000BASE-BX10-D
Xcvr 5	REV 01	740-021341	5255886	SFP-1000BASE-BX10-U
Xcvr 7	REV 01	740-021340	77E245N00003	SFP-1000BASE-BX10-U
Xcvr 8	REV 01	740-021341	5255888	SFP-1000BASE-BX10-U
PIC 3		BUILTIN	BUILTIN	10x 1GE(LAN)
Xcvr 0	REV 01	740-017726	74S184H30341	SFP-EX
Xcvr 1	REV 01	740-017726	4814061	SFP-EX
Xcvr 5	REV 01	740-017726	6ZS184H31108	SFP-EX
Xcvr 9	REV 01	740-021340	76E245X00486	SFP-1000BASE-BX10-U
Fan Tray 0				
Fan Tray 1	REV 03	740-014971	TP0850	Fan Tray

## show chassis hardware (MX960 Router with Enhanced MX SCB)

user@host&gt; show chassis hardware

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN1096805AFA	MX960
Midplane	REV 03	710-013698	TR0183	MX960 Backplane

Fan Extender	REV 02	710-018051	JY5227	Extended Cable Manager
FPM Board	REV 03	710-014974	JZ6876	Front Panel Display
PDM	Rev 03	740-013110	QCS11035023	Power Distribution Module
PEM 1	Rev 03	740-013682	QCS1109400L	PS 1.7kW; 200-240VAC in
PEM 2	Rev 03	740-013682	QCS11094015	PS 1.7kW; 200-240VAC in
PEM 3	Rev 03	740-013682	QCS11094012	PS 1.7kW; 200-240VAC in
Routing Engine 0	REV 06	740-013063	1000687969	RE-S-2000
Routing Engine 1	REV 06	740-013063	1000687955	RE-S-2000
CB 0	REV 11	750-031391	YZ6072	Enhanced MX SCB
CB 1	REV 11	750-031391	YZ6068	Enhanced MX SCB
CB 2	REV 11	750-031391	YZ6081	Enhanced MX SCB
FPC 0	REV 01	750-018122	KA5576	DPCE 40x 1GE R
CPU	REV 06	710-013713	KB3961	DPC PMB
PIC 0		BUILTIN	BUILTIN	10x 1GE(LAN)
Xcvr 0	REV 01	740-011613	P9F18GF	SFP-SX
Xcvr 2	REV 01	740-011782	P9M0TL9	SFP-SX
Xcvr 7	REV 01	740-011782	P9POXXH	SFP-SX
Xcvr 9	REV 01	740-011782	P9M0TN1	SFP-SX
PIC 1		BUILTIN	BUILTIN	10x 1GE(LAN)
Xcvr 0	REV 01	740-011613	PAJ4UHC	SFP-SX
PIC 2		BUILTIN	BUILTIN	10x 1GE(LAN)
Xcvr 0	REV 01	740-011613	PFF2CD0	SFP-SX
Xcvr 1	REV 01	740-011613	PBG3ZUT	SFP-SX
Xcvr 2	REV 01	740-011613	PFF2DDV	SFP-SX
Xcvr 5	REV 01	740-011613	P8E2SST	SFP-SX
Xcvr 9	REV 01	740-011782	PB8329N	SFP-SX
PIC 3		BUILTIN	BUILTIN	10x 1GE(LAN)
Xcvr 0	REV 01	740-026192	1U0201084503342	SFP-100BASE-BX10-U
Xcvr 1	REV 01	740-026193	1U1201084503313	SFP-100BASE-BX10-D
Xcvr 2	REV 01	740-011613	PAJ4Y5B	SFP-SX
Xcvr 6	REV 01	740-011782	P9M0U3M	SFP-SX
Xcvr 7	REV 01	740-011782	P9M0TLA	SFP-SX
FPC 1	REV 16	750-031089	YL0719	MPC Type 2 3D
CPU	REV 06	711-030884	YL1463	MPC PMB 2G
MIC 0	REV 07	750-028387	JR6500	3D 4x 10GE XFP
PIC 0		BUILTIN	BUILTIN	2x 10GE XFP
Xcvr 0	REV 01	740-014279	733019A00154	XFP-10G-LR
Xcvr 1	REV 02	740-014289	T09F55034	XFP-10G-SR
PIC 1		BUILTIN	BUILTIN	2x 10GE XFP
Xcvr 0	REV 01	740-014279	913019B00791	XFP-10G-LR
Xcvr 1	REV 01	740-014289	98S803A90384	XFP-10G-SR
MIC 1	REV 24	750-028387	YJ3950	3D 4x 10GE XFP
PIC 2		BUILTIN	BUILTIN	2x 10GE XFP
Xcvr 0	REV 02	740-014279	T10B36134	XFP-10G-LR
Xcvr 1	REV 01	740-014289	T07M86354	XFP-10G-SR
PIC 3		BUILTIN	BUILTIN	2x 10GE XFP
FPC 2	REV 08	710-014219	JY9654	DPCE 4x 10GE R
CPU	REV 06	710-013713	JZ6549	DPC PMB
PIC 0		BUILTIN	BUILTIN	1x 10GE(LAN/WAN)
PIC 1		BUILTIN	BUILTIN	1x 10GE(LAN/WAN)
PIC 2		BUILTIN	BUILTIN	1x 10GE(LAN/WAN)
Xcvr 0	REV 03	740-011571	C931BK028	XFP-10G-SR
PIC 3		BUILTIN	BUILTIN	1x 10GE(LAN/WAN)
FPC 3	REV 10	750-024199	XJ6692	MX FPC Type 3
CPU	REV 03	710-022351	XF5182	DPC PMB
PIC 0	REV 17	750-009553	RJ2945	4x OC-48 SONET
Xcvr 1	REV 01	740-011785	PCP3YLL	SFP-SR
Xcvr 3	REV 01	740-011785	PDSOMRY	SFP-SR
PIC 1	REV 32	750-003700	DP2113	1x OC-192 12xMM VSR
FPC 5	REV 25	750-028467	YM8256	MPC 3D 16x 10GE



CPU	REV 10	711-029089	YL3029	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 1	REV 01	740-031980	AHNOX1Z	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
FPC 7	REV 02	750-031092	JR6658	MPC Type 1 3D Q
CPU	REV 01	711-030884	JZ9038	MPC PMB 2G
MIC 0	REV 08	750-028392	JZ8737	3D 20x 1GE(LAN) SFP
PIC 0		BUILTIN	BUILTIN	10x 1GE(LAN) SFP
Xcvr 0	REV 01	740-011782	PBE2C6Y	SFP-SX
Xcvr 2		NON-JNPR	U8105N8	SFP-SX
Xcvr 4	REV 01	740-011613	PFM18EF	SFP-SX
Xcvr 7	REV 01	740-011613	PFF2AM8	SFP-SX
Xcvr 8	REV 01	740-011613	PFF2CT6	SFP-SX
PIC 1		BUILTIN	BUILTIN	10x 1GE(LAN) SFP
Xcvr 0	REV 01	740-011782	PB82VHH	SFP-SX
Xcvr 1	REV 01	740-011613	PFF2CSW	SFP-SX
Xcvr 9	REV 01	740-011613	PFF2BY0	SFP-SX
QXM 0	REV 04	711-028408	JR6372	MPC QXM
FPC 8	REV 05	750-024387	JW9754	MX FPC Type 2
CPU	REV 03	710-022351	KF1651	DPC PMB
PIC 0	REV 08	750-014730	DM3664	4x OC-3 1x OC-12 SFP
Xcvr 0	REV 01	740-016065	81S290N00077	SFP-SR
Xcvr 1		NON-JNPR	2191844	SFP-SR
Xcvr 2	REV 01	740-011618	PD81EE5	SFP-IR
PIC 1	REV 08	750-014637	DM3671	4x OC-12-3 SFP
Xcvr 0	REV 01	740-011785	PCK3UNK	SFP-SR
Xcvr 3	REV 01	740-011785	PDSOMPZ	SFP-SR
FPC 10	REV 04	710-013699	JY4654	DPCE 40x 1GE R
CPU	REV 05	710-013713	JS9717	DPC PMB
PIC 0		BUILTIN	BUILTIN	10x 1GE(LAN)
Xcvr 5	REV 01	740-011782	PAR1L72	SFP-SX
Xcvr 6	REV 01	740-011782	P8N1YQ4	SFP-SX
PIC 1		BUILTIN	BUILTIN	10x 1GE(LAN)
PIC 2		BUILTIN	BUILTIN	10x 1GE(LAN)
Xcvr 0	REV 01	740-011782	P8Q2AVL	SFP-SX
Xcvr 5	REV 01	740-011782	PAR1L7B	SFP-SX
Xcvr 6	REV 01	740-011782	PAR1L2J	SFP-SX
Xcvr 8	REV 01	740-011782	P8N1YMY	SFP-SX
PIC 3		BUILTIN	BUILTIN	10x 1GE(LAN)
Fan Tray 0	REV 03	740-014971	TP0567	Fan Tray
Fan Tray 1	REV 03	740-014971	TP0702	Fan Tray

### show chassis hardware models (MX960 Router with Enhanced MX SCB)

```
user@host> show chassis hardware models
```

Hardware inventory:

Item	Version	Part number	Serial number	FRU model number
Midplane	REV 03	710-013698	TR0183	CHAS-BP-MX960-S
Fan Extender	REV 02	710-018051	JY5227	ECM-MX960
FPM Board	REV 03	710-014974	JZ6876	CRAFT-MX960-S
Routing Engine 0	REV 06	740-013063	1000687969	RE-S-2000-4096-S
Routing Engine 1	REV 06	740-013063	1000687955	RE-S-2000-4096-S
CB 0	REV 11	750-031391	YZ6072	SCBE-MX-S
CB 1	REV 11	750-031391	YZ6068	SCBE-MX-S
CB 2	REV 11	750-031391	YZ6081	SCBE-MX-S
FPC 0	REV 01	750-018122	KA5576	DPCE-R-40GE-SFP
FPC 1	REV 16	750-031089	YL0719	MX-MPC2-3D

MIC 0	REV 07	750-028387	JR6500	MIC-3D-4XGE-XFP
MIC 1	REV 24	750-028387	YJ3950	MIC-3D-4XGE-XFP
FPC 2	REV 08	710-014219	JY9654	DPC-R-4XGE-XFP
FPC 3	REV 10	750-024199	XJ6692	MX-FPC3
PIC 0	REV 17	750-009553	RJ2945	PC-40C48-SON-SFP
PIC 1	REV 32	750-003700	DP2113	PC-10C192-SON-VSR
FPC 5	REV 25	750-028467	YM8256	MPC-3D-16XGE-SFPP
FPC 7	REV 02	750-031092	JR6658	MX-MPC1-3D-Q
MIC 0	REV 08	750-028392	JZ8737	MIC-3D-20GE-SFP
FPC 8	REV 05	750-024387	JW9754	MX-FPC2
PIC 0	REV 08	750-014730	DM3664	PB-40C3-10C12-SON2-SFP
PIC 1	REV 08	750-014637	DM3671	PB-40C3-40C12-SON-SFP
FPC 10	REV 04	710-013699	JY4654	DPC-R-40GE-SFP
Fan Tray 0	REV 03	740-014971	TP0567	FFANTRAY-MX960-S
Fan Tray 1	REV 03	740-014971	TP0702	FFANTRAY-MX960-S

### show chassis hardware (MX960 Router with MPC5EQ)

```
user@host> show chassis hardware
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN1214852AFA	MX960
Midplane	REV 01	710-030012	ACAX3674	MX960 Backplane
FPM Board	REV 03	710-014974	CAAZ9326	Front Panel Display
PDM	Rev 03	740-013110	QCS17025017	Power Distribution Module
PEM 0 in	Rev 10	740-027760	QCS1702N062	PS 4.1kW; 200-240V AC
PEM 1 in	Rev 04	740-027760	QCS1422N02C	PS 4.1kW; 200-240V AC
PEM 2 in	Rev 09	740-027760	QCS1614N01X	PS 4.1kW; 200-240V AC
Routing Engine 0	REV 08	740-031116	9009131803	RE-S-1800x4
Routing Engine 1	REV 08	740-031116	9009124913	RE-S-1800x4
CB 0	REV 18	750-031391	CABF0579	Enhanced MX SCB
CB 1	REV 16	750-031391	CAAZ2471	Enhanced MX SCB
CB 2	REV 16	750-031391	CAAW9595	Enhanced MX SCB
FPC 0	REV 18	750-046005	CACE6574	MPC5E 3D Q 2CGE+4XGE
CPU	REV 09	711-045719	CACG8908	RMPC PMB
PIC 0		BUILTIN	BUILTIN	2X10GE SFPP OTN
Xcvr 0	REV 01	740-021308	AQAODYT	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQGOMS7	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	1X100GE CFP2 OTN
Xcvr 0	REV 01	740-046563	XD16FC03Z	CFP2-100G-SR10
PIC 2		BUILTIN	BUILTIN	2X10GE SFPP OTN
Xcvr 0	REV 01	740-021308	ANAONAJ	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQGOMRQ	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	1X100GE CFP2 OTN
Xcvr 0	REV 01	740-049775	J13K72993	CFP2-100G-LR4
FPC 1	REV 11	750-045372	CABK8154	MPCE Type 3 3D
CPU	REV 08	711-035209	CABE7370	HMPC PMB 2G
MIC 0	REV 07	750-033307	CABD5255	10X10GE SFPP
PIC 0		BUILTIN	BUILTIN	10X10GE SFPP
Xcvr 0	REV 01	740-021308	AQ50319	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQ5035V	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AQ502XJ	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQ43HHR	SFP+-10G-SR
Xcvr 4	REV 01	740-021308	AQ502YA	SFP+-10G-SR
Xcvr 5	REV 01	740-021308	AQ502EU	SFP+-10G-SR
Xcvr 6	REV 01	740-021308	AQ502HR	SFP+-10G-SR

Xcvr 7	REV 01	740-021308	AQ502A6	SFP+-10G-SR
Xcvr 8	REV 01	740-021308	AQ43H8M	SFP+-10G-SR
MIC 1	REV 14	750-033196	CAAP1398	1X100GE CXP
PIC 2		BUILTIN	BUILTIN	1X100GE CXP
Xcvr 0	REV 01	740-046563	XD16FC064	CFP-100G-SR10
FPC 3	REV 35	750-028467	CAAT9156	MPC 3D 16x 10GE
CPU	REV 11	711-029089	CAAV4645	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	AQ43HZ1	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQ43HZC	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AQ43HD2	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQ502HN	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	AQ43HGF	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQ501RZ	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AQ5029V	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQ501X9	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	AQ502ZN	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQ43H86	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AQ502ZY	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQ502PZ	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	AQ503E6	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQ502XN	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B11F00213	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQ50336	SFP+-10G-SR
FPC 4	REV 18	750-046005	CACE6568	MPC5E 3D Q 2CGE+4XGE
CPU	REV 09	711-045719	CACG8900	RMPC PMB
PIC 0		BUILTIN	BUILTIN	2X10GE SFPP OTN
Xcvr 0	REV 01	740-021308	AQA095A	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQGOM1E	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	1X100GE CFP2 OTN
Xcvr 0		NON-JNPR	FE13F000F	CFP2-100G-SR10
PIC 2		BUILTIN	BUILTIN	2X10GE SFPP OTN
Xcvr 0	REV 01	740-021308	AQGOLYC	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQGOLYB	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	1X100GE CFP2 OTN
Xcvr 0	REV 01	740-048813	XD32FE00Z	CFP2-100G-SR10
FPC 5	REV 18	750-046005	CACE6577	MPC5E 3D Q 2CGE+4XGE
CPU	REV 09	711-045719	CACG8902	RMPC PMB
PIC 0		BUILTIN	BUILTIN	2X10GE SFPP OTN
Xcvr 0	REV 01	740-021308	AQGOMXE	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQGOLVY	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	1X100GE CFP2 OTN
Xcvr 0	REV 01	740-046563	XD16FC03T	CFP2-100G-SR10
PIC 2		BUILTIN	BUILTIN	2X10GE SFPP OTN
Xcvr 0	REV 01	740-021308	AQGOLW1	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQGOLW3	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	1X100GE CFP2 OTN
Xcvr 0		NON-JNPR	FE13F000J	CFP2-100G-SR10
FPC 7	REV 09	750-037355	CAAF0937	MPC4E 3D 2CGE+8XGE
CPU	REV 08	711-035209	CAAD8004	HMPC PMB 2G
PIC 0		BUILTIN	BUILTIN	4x10GE SFPP
Xcvr 0	REV 01	740-021308	ANAOMM3	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	1X100GE CFP
Xcvr 0	REV 01	740-035329	X000C163	CFP-100G-SR10
PIC 2		BUILTIN	BUILTIN	4x10GE SFPP
Xcvr 0	REV 01	740-021308	AQGOMS6	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQGOMRX	SFP+-10G-SR

Xcvr 2	REV 01	740-021308	AQG0M6Y	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQG0LZM	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	1X100GE CFP
Xcvr 0	REV 01	740-035329	X12J00499	CFP-100G-SR10
FPC 8	REV 39	750-045715	CACD1903	MPC5E 3D Q 24XGE+6XLGE
CPU	REV 09	711-045719	CACD1815	RMPC PMB
PIC 0		BUILTIN	BUILTIN	12X10GE SFPP OTN
PIC 1		BUILTIN	BUILTIN	12X10GE SFPP OTN
PIC 2		BUILTIN	BUILTIN	3X40GE QSFPP
Xcvr 0	REV 01	740-046565	QC480289	QSFP+-40G-SR4
Xcvr 1	REV 01	740-046565	QC480274	QSFP+-40G-SR4
Xcvr 2	REV 01	740-046565	QD130190	QSFP+-40G-SR4
PIC 3		BUILTIN	BUILTIN	3X40GE QSFPP
Xcvr 0	REV 01	740-046565	QD130197	QSFP+-40G-SR4
Xcvr 1	REV 01	740-046565	QD130180	QSFP+-40G-SR4
Xcvr 2	REV 01	740-046565	QD130199	QSFP+-40G-SR4
WAN MEZZ	REV 09	750-049136	CABN0415	MPC5E 24XGE OTN Mezz
FPC 9	REV 05	750-044444	CAAY9801	MPCE Type 2 3D P
CPU	REV 04	711-038484	CAAW3673	MPCE PMB 2G
MIC 0	REV 28	750-028387	CAAX1071	3D 4x 10GE XFP
PIC 0		BUILTIN	BUILTIN	2x 10GE XFP
Xcvr 0		NON-JNPR	T12L92342	XFP-10G-SR
Xcvr 1		NON-JNPR	T12L92303	XFP-10G-SR
PIC 1		BUILTIN	BUILTIN	2x 10GE XFP
Xcvr 0		NON-JNPR	CC07BK02X	XFP-10G-SR
QXM 0	REV 06	711-028408	CAAW4883	MPC QXM
QXM 1	REV 06	711-028408	CAAW4603	MPC QXM
FPC 10	REV 21.0.11	750-045715	CAAY3541	MPC5E 3D Q 24XGE+6XLGE
CPU	REV 07	711-045719	CAAW7426	RMPC PMB
PIC 0		BUILTIN	BUILTIN	12X10GE SFPP
Xcvr 0	REV 01	740-031980	AHK01AP	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQ502ZU	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AP41BLS	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQA08YA	SFP+-10G-SR
Xcvr 4	REV 01	740-021308	AQA0K26	SFP+-10G-SR
Xcvr 6	REV 01	740-021308	AQA06S3	SFP+-10G-SR
Xcvr 7	REV 01	740-021308	AQA06AS	SFP+-10G-SR
Xcvr 8	REV 01	740-021308	AQA053N	SFP+-10G-SR
Xcvr 9	REV 01	740-021308	AQA0E97	SFP+-10G-SR
Xcvr 10	REV 01	740-021308	AQA0GS4	SFP+-10G-SR
Xcvr 11	REV 01	740-021308	AQA0JVA	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	12X10GE SFPP
Xcvr 0	REV 01	740-021308	AQA057A	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	ANA0MLS	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AQA093A	SFP+-10G-SR
Xcvr 3	REV 01	740-021309	943153A00075	SFP+-10G-LR
Xcvr 4	REV 01	740-021308	AQA077B	SFP+-10G-SR
Xcvr 5	REV 01	740-021308	AQA0JSC	SFP+-10G-SR
Xcvr 6	REV 01	740-021308	AQA0735	SFP+-10G-SR
Xcvr 7	REV 01	740-021308	AQ5028N	SFP+-10G-SR
Xcvr 8	REV 01	740-031980	AP40VN5	SFP+-10G-SR
Xcvr 9	REV 01	740-021308	AQA0K0J	SFP+-10G-SR
Xcvr 10	REV 01	740-021308	AQA07AP	SFP+-10G-SR
Xcvr 11	REV 01	740-021308	AQA08YB	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	3X40GE QSFPP
PIC 3		BUILTIN	BUILTIN	3X40GE QSFPP
WAN MEZZ	REV 07	750-045717	CAAX3123	MPC5E 24XGE Mezz
FPC 11	REV 17	750-037355	CAAT3986	MPC4E 3D 2CGE+8XGE
CPU	REV 08	711-035209	CAAR3972	HMPC PMB 2G
PIC 0		BUILTIN	BUILTIN	4x10GE SFPP

Xcvr 0	REV 01	740-021308	AQA0DSE	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQ501Y3	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AQ501XU	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQ5036Y	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	1X100GE CFP
Xcvr 0		NON-JNPR	X12J00247	CFP-100G-SR10
PIC 2		BUILTIN	BUILTIN	4x10GE SFPP
Xcvr 0	REV 01	740-031980	ALQ1DKF	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AJ403YA	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AP40TY0	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	ALQ14G0	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	1X100GE CFP
Xcvr 0	REV 01	740-035329	X12J00095	CFP-100G-SR10
Fan Tray 0	REV 08	740-031521	ACAF4219	Enhanced Fan Tray
Fan Tray 1	REV 08	740-031521	ACAF4225	Enhanced Fan Tray

### show chassis hardware detail (MX960 Router)

```
user@host> show chassis hardware detail
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis				MX960
Midplane	REV 01	710-013698	AA6082	MX960 Midplane
PIM	Rev 01	740-013110	000008	Power Inlet Module
PEM 2				
PEM 3	Rev 01	740-013682	000038	PS 1.7kW; 200-240VAC in
Routing Engine 0	REV 00	740-015113	1000617944	RE-S-1300
ad0 245 MB	SanDisk	SDCFB-256	111419E1805T1141	Compact Flash
ad2 38154 MB	FUJITSU	MHT2040BH	NR0WT5925N77	Hard Disk
CB 0	REV 05	710-013725	JK6947	MX960 Test SCB
FPC 4	REV 01	710-013305	JM7617	MX960 Test DPC
CPU				
PIC 0		BUILTIN	BUILTIN	1x 10GE(LAN/WAN)
PIC 1		BUILTIN	BUILTIN	10x 1GE
FPC 7	REV 01	710-013305	JL9634	MX960 Test DPC
CPU				
PIC 0		BUILTIN	BUILTIN	1x 10GE(LAN/WAN)
Xcvr 0		NON-JNPR	MYBG65I82C	XFP-10G-SR
PIC 1		BUILTIN	BUILTIN	10x 1GE
Xcvr 1	REV 01	740-011782	P7N0368	SFP-SX
Xcvr 4	REV 01	740-011782	P8J1W27	SFP-SX
Xcvr 6	REV 01	740-011782	P8J1VSD	SFP-SX
Xcvr 9	REV 01	740-011782	P8J1W25	SFP-SX
Fan Tray 0				
Fan Tray 1				

### show chassis hardware detail (MX960 Router with MPC5EQ)

```
user@host> show chassis hardware detail
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN1214852AFA	MX960
Midplane	REV 01	710-030012	ACAX3674	MX960 Backplane
FPM Board	REV 03	710-014974	CAAZ9326	Front Panel Display
PDM	Rev 03	740-013110	QCS17025017	Power Distribution Module
PEM 0	Rev 10	740-027760	QCS1702N062	PS 4.1kW; 200-240V AC in

PEM 1	Rev 04	740-027760	QCS1422N02C	PS 4.1kW; 200-240V AC
in				
PEM 2	Rev 09	740-027760	QCS1614N01X	PS 4.1kW; 200-240V AC
in				
Routing Engine 0	REV 08	740-031116	9009131803	RE-S-1800x4
ad0 3831 MB	UGB30SFA4000T1		SFA4000T1 000016CD	Compact Flash
ad1 30533 MB	UGB94BPH32H0S1-KCI		11000061346	Disk 1
usb0 (addr 1)	EHCI root hub 0		Intel	uhub0
usb0 (addr 2)	product 0x0020 32		vendor 0x8087	uhub1
DIMM 0	VL31B5263F-F8SD DIE	REV-0 PCB REV-0		MFR ID-ce80
DIMM 1	VL31B5263F-F8SD DIE	REV-0 PCB REV-0		MFR ID-ce80
DIMM 2	VL31B5263F-F8SD DIE	REV-0 PCB REV-0		MFR ID-ce80
DIMM 3	VL31B5263F-F8SD DIE	REV-0 PCB REV-0		MFR ID-ce80
Routing Engine 1	REV 08	740-031116	9009124913	RE-S-1800x4
ad0 3831 MB	UGB30SFA4000T1		SFA4000T1 0000106D	Compact Flash
ad1 30533 MB	UGB94BPH32H0S1-KCI		11000052402	Disk 1
CB 0	REV 18	750-031391	CABF0579	Enhanced MX SCB
CB 1	REV 16	750-031391	CAAZ2471	Enhanced MX SCB
CB 2	REV 16	750-031391	CAAW9595	Enhanced MX SCB
FPC 0	REV 18	750-046005	CACE6574	MPC5E 3D Q 2CGE+4XGE
CPU	REV 09	711-045719	CACG8908	RMPD PMB
PIC 0		BUILTIN	BUILTIN	2X10GE SFPP OTN
Xcvr 0	REV 01	740-021308	AQA0DYT	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQG0MS7	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	1X100GE CFP2 OTN
Xcvr 0	REV 01	740-046563	XD16FC03Z	CFP2-100G-SR10
PIC 2		BUILTIN	BUILTIN	2X10GE SFPP OTN
Xcvr 0	REV 01	740-021308	ANA0NAJ	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQG0MRQ	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	1X100GE CFP2 OTN
Xcvr 0	REV 01	740-049775	J13K72993	CFP2-100G-LR4
FPC 1	REV 11	750-045372	CABK8154	MPCE Type 3 3D
CPU	REV 08	711-035209	CABE7370	HMPC PMB 2G
MIC 0	REV 07	750-033307	CABD5255	10X10GE SFPP
PIC 0		BUILTIN	BUILTIN	10X10GE SFPP
Xcvr 0	REV 01	740-021308	AQ50319	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQ5035V	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AQ502XJ	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQ43HHR	SFP+-10G-SR
Xcvr 4	REV 01	740-021308	AQ502YA	SFP+-10G-SR
Xcvr 5	REV 01	740-021308	AQ502EU	SFP+-10G-SR
Xcvr 6	REV 01	740-021308	AQ502HR	SFP+-10G-SR
Xcvr 7	REV 01	740-021308	AQ502A6	SFP+-10G-SR
Xcvr 8	REV 01	740-021308	AQ43H8M	SFP+-10G-SR
MIC 1	REV 14	750-033196	CAAP1398	1X100GE CXP
PIC 2		BUILTIN	BUILTIN	1X100GE CXP
Xcvr 0	REV 01	740-046563	XD16FC064	CFP2-100G-SR10
FPC 3	REV 35	750-028467	CAAT9156	MPC 3D 16x 10GE
CPU	REV 11	711-029089	CAAV4645	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	AQ43HZ1	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQ43HZC	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AQ43HD2	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQ502HN	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	AQ43HGF	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQ501RZ	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AQ5029V	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQ501X9	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+

Xcvr 0	REV 01	740-021308	AQ502ZN	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQ43H86	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AQ502ZY	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQ502PZ	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	AQ503E6	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQ502XN	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B11F00213	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQ50336	SFP+-10G-SR
FPC 4	REV 18	750-046005	CACE6568	MPC5E 3D Q 2CGE+4XGE
CPU	REV 09	711-045719	CACG8900	RMPC PMB
PIC 0		BUILTIN	BUILTIN	2X10GE SFPP OTN
Xcvr 0	REV 01	740-021308	AQA095A	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQGOM1E	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	1X100GE CFP2 OTN
Xcvr 0		NON-JNPR	FE13F000F	CFP2-100G-SR10
PIC 2		BUILTIN	BUILTIN	2X10GE SFPP OTN
Xcvr 0	REV 01	740-021308	AQGOLYC	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQGOLYB	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	1X100GE CFP2 OTN
Xcvr 0	REV 01	740-048813	XD32FE00Z	CFP2-100G-SR10
FPC 5	REV 18	750-046005	CACE6577	MPC5E 3D Q 2CGE+4XGE
CPU	REV 09	711-045719	CACG8902	RMPC PMB
PIC 0		BUILTIN	BUILTIN	2X10GE SFPP OTN
Xcvr 0	REV 01	740-021308	AQGOMXE	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQGOLVY	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	1X100GE CFP2 OTN
Xcvr 0	REV 01	740-046563	XD16FC03T	CFP2-100G-SR10
PIC 2		BUILTIN	BUILTIN	2X10GE SFPP OTN
Xcvr 0	REV 01	740-021308	AQGOLW1	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQGOLW3	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	1X100GE CFP2 OTN
Xcvr 0		NON-JNPR	FE13F000J	CFP2-100G-SR10
FPC 7	REV 09	750-037355	CAAF0937	MPC4E 3D 2CGE+8XGE
CPU	REV 08	711-035209	CAAD8004	HMPC PMB 2G
PIC 0		BUILTIN	BUILTIN	4x10GE SFPP
Xcvr 0	REV 01	740-021308	ANAOmm3	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	1X100GE CFP
Xcvr 0	REV 01	740-035329	X000C163	CFP-100G-SR10
PIC 2		BUILTIN	BUILTIN	4x10GE SFPP
Xcvr 0	REV 01	740-021308	AQGOMS6	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQGOMRX	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AQGOM6Y	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQGOLZM	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	1X100GE CFP
Xcvr 0	REV 01	740-035329	X12J00499	CFP-100G-SR10
FPC 8	REV 39	750-045715	CACD1903	MPC5E 3D Q 24XGE+6XLGE
CPU	REV 09	711-045719	CACD1815	RMPC PMB
PIC 0		BUILTIN	BUILTIN	12X10GE SFPP OTN
PIC 1		BUILTIN	BUILTIN	12X10GE SFPP OTN
PIC 2		BUILTIN	BUILTIN	3X40GE QSFP
Xcvr 0	REV 01	740-046565	QC480289	QSFP+-40G-SR4
Xcvr 1	REV 01	740-046565	QC480274	QSFP+-40G-SR4
Xcvr 2	REV 01	740-046565	QD130190	QSFP+-40G-SR4
PIC 3		BUILTIN	BUILTIN	3X40GE QSFP
Xcvr 0	REV 01	740-046565	QD130197	QSFP+-40G-SR4
Xcvr 1	REV 01	740-046565	QD130180	QSFP+-40G-SR4
Xcvr 2	REV 01	740-046565	QD130199	QSFP+-40G-SR4
WAN MEZZ	REV 09	750-049136	CABN0415	MPC5E 24XGE OTN Mezz
FPC 9	REV 05	750-044444	CAAY9801	MPCE Type 2 3D P

CPU	REV 04	711-038484	CAAW3673	MPCE PMB 2G
MIC 0	REV 28	750-028387	CAAX1071	3D 4x 10GE XFP
PIC 0		BUILTIN	BUILTIN	2x 10GE XFP
Xcvr 0		NON-JNPR	T12L92342	XFP-10G-SR
Xcvr 1		NON-JNPR	T12L92303	XFP-10G-SR
PIC 1		BUILTIN	BUILTIN	2x 10GE XFP
Xcvr 0		NON-JNPR	CC07BK02X	XFP-10G-SR
QXM 0	REV 06	711-028408	CAAW4883	MPC QXM
QXM 1	REV 06	711-028408	CAAW4603	MPC QXM
FPC 10	REV 21.0.11	750-045715	CAAY3541	MPC5E 3D Q 24XGE+6XLGE
CPU	REV 07	711-045719	CAAW7426	RMPC PMB
PIC 0		BUILTIN	BUILTIN	12X10GE SFPP
Xcvr 0	REV 01	740-031980	AHK01AP	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQ502ZU	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AP41BLS	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQA08YA	SFP+-10G-SR
Xcvr 4	REV 01	740-021308	AQA0K26	SFP+-10G-SR
Xcvr 6	REV 01	740-021308	AQA06S3	SFP+-10G-SR
Xcvr 7	REV 01	740-021308	AQA06AS	SFP+-10G-SR
Xcvr 8	REV 01	740-021308	AQA053N	SFP+-10G-SR
Xcvr 9	REV 01	740-021308	AQA0E97	SFP+-10G-SR
Xcvr 10	REV 01	740-021308	AQA0GS4	SFP+-10G-SR
Xcvr 11	REV 01	740-021308	AQA0JVA	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	12X10GE SFPP
Xcvr 0	REV 01	740-021308	AQA057A	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	ANAOMLS	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AQA093A	SFP+-10G-SR
Xcvr 3	REV 01	740-021309	943153A00075	SFP+-10G-LR
Xcvr 4	REV 01	740-021308	AQA077B	SFP+-10G-SR
Xcvr 5	REV 01	740-021308	AQA0JSC	SFP+-10G-SR
Xcvr 6	REV 01	740-021308	AQA0735	SFP+-10G-SR
Xcvr 7	REV 01	740-021308	AQ5028N	SFP+-10G-SR
Xcvr 8	REV 01	740-031980	AP40VN5	SFP+-10G-SR
Xcvr 9	REV 01	740-021308	AQA0K0J	SFP+-10G-SR
Xcvr 10	REV 01	740-021308	AQA07AP	SFP+-10G-SR
Xcvr 11	REV 01	740-021308	AQA08YB	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	3X40GE QSFPP
PIC 3		BUILTIN	BUILTIN	3X40GE QSFPP
WAN MEZZ	REV 07	750-045717	CAAX3123	MPC5E 24XGE Mezz
FPC 11	REV 17	750-037355	CAAT3986	MPC4E 3D 2CGE+8XGE
CPU	REV 08	711-035209	CAAR3972	HMPC PMB 2G
PIC 0		BUILTIN	BUILTIN	4x10GE SFPP
Xcvr 0	REV 01	740-021308	AQA0DSE	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQ501Y3	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AQ501XU	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQ5036Y	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	1X100GE CFP
Xcvr 0		NON-JNPR	X12J00247	CFP-100G-SR10
PIC 2		BUILTIN	BUILTIN	4x10GE SFPP
Xcvr 0	REV 01	740-031980	ALQ1DKF	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AJ403YA	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AP40TY0	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	ALQ14G0	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	1X100GE CFP
Xcvr 0	REV 01	740-035329	X12J00095	CFP-100G-SR10
Fan Tray 0	REV 08	740-031521	ACAF4219	Enhanced Fan Tray
Fan Tray 1	REV 08	740-031521	ACAF4225	Enhanced Fan Tray





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P/N:          740-013110      S/N:          QCS17025017
Assembly ID:  0x0416          Assembly Version: 01.03
Date:         01-10-2013      Assembly Flags:  0x00
Version:      Rev 03
ID: Power Distribution Module
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00
I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 16 01 03 52 65 76 20 30 33 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 31 33 31 31 30 00 00
  Address 0x20: 51 43 53 31 37 30 32 35 30 31 37 00 00 0a 01 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PEM 0          Rev 10    740-027760    QCS1702N062    PS 4.1kW; 200-240V AC
in
Jedec Code:    0x7fb0      EEPROM Version:  0x01
P/N:           740-027760   S/N:           QCS1702N062
Assembly ID:   0x0430      Assembly Version: 01.10
Date:         01-15-2013   Assembly Flags:  0x00
Version:      Rev 10
ID: PS 4.1kW; 200-240V AC in  FRU Model Number: PWR-MX960-4100-AC-S
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 30 01 0a 52 65 76 20 31 30 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 32 37 37 36 30 00 00
  Address 0x20: 51 43 53 31 37 30 32 4e 30 36 32 00 00 0f 01 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 50
  Address 0x50: 57 52 2d 4d 58 39 36 30 2d 34 31 30 30 2d 41 43
  Address 0x60: 2d 53 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PEM 1          Rev 04    740-027760    QCS1422N02C    PS 4.1kW; 200-240V AC
in
Jedec Code:    0x7fb0      EEPROM Version:  0x01
P/N:           740-027760   S/N:           QCS1422N02C
Assembly ID:   0x0430      Assembly Version: 01.04
Date:         06-04-2010   Assembly Flags:  0x00
Version:      Rev 04
ID: PS 4.1kW; 200-240V AC in  FRU Model Number: PWR-MX960-4100-AC-S
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 30 01 04 52 65 76 20 30 34 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 32 37 37 36 30 00 00
  Address 0x20: 51 43 53 31 34 32 32 4e 30 32 43 00 00 04 06 07
  Address 0x30: da ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 50
  Address 0x50: 57 52 2d 4d 58 39 36 30 2d 34 31 30 30 2d 41 43
  Address 0x60: 2d 53 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PEM 2          Rev 09    740-027760    QCS1614N01X    PS 4.1kW; 200-240V AC
in
Jedec Code:    0x7fb0      EEPROM Version:  0x01
P/N:           740-027760   S/N:           QCS1614N01X
Assembly ID:   0x0430      Assembly Version: 01.09
Date:         04-07-2012   Assembly Flags:  0x00

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Version:          Rev 09
ID: PS 4.1kW; 200-240V AC in    FRU Model Number: PWR-MX960-4100-AC-S
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 30 01 09 52 65 76 20 30 39 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 32 37 37 36 30 00 00
  Address 0x20: 51 43 53 31 36 31 34 4e 30 31 58 00 00 07 04 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 50
  Address 0x50: 57 52 2d 4d 58 39 36 30 2d 34 31 30 30 2d 41 43
  Address 0x60: 2d 53 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Routing Engine 0 REV 08    740-031116    9009131803    RE-S-1800x4
Jedec Code: 0x7fb0        EEPROM Version: 0x02
P/N:          740-031116    S/N:          9009131803
Assembly ID: 0x09c0        Assembly Version: 01.08
Date:         03-04-2013    Assembly Flags: 0x00
Version:      REV 08        CLEI Code:     COUCASKBAA
ID: RE-S-1800x4            FRU Model Number: RE-S-1800X4-16G-S
Board Information Record:
  Address 0x00: 54 32 30 32 37 44 42 2d 34 34 47 42 23 42 23 00
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 09 c0 01 08 52 45 56 20 30 38 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 33 31 31 31 36 00 00
  Address 0x20: 39 30 30 39 31 33 31 38 30 33 00 00 00 04 03 07
  Address 0x30: dd ff ff ff 54 32 30 32 37 44 42 2d 34 34 47 42
  Address 0x40: 23 42 23 00 01 43 4f 55 43 41 53 4b 42 41 41 52
  Address 0x50: 45 2d 53 2d 31 38 30 30 58 34 2d 31 36 47 2d 53
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 59 ff ff ff ff ff ff ff ff ff ff ff ff
ad0    3831 MB    UGB30SFA4000T1    SFA4000T1 000016CD Compact Flash
ad1    30533 MB   UGB94BPH32H0S1-KCI 11000061346    Disk 1
usb0 (addr 1) EHCI root hub 0    Intel    uhub0
usb0 (addr 2) product 0x0020 32    vendor 0x8087    uhub1
DIMM 0    VL31B5263F-F8SD DIE REV-0 PCB REV-0    MFR ID-ce80
DIMM 1    VL31B5263F-F8SD DIE REV-0 PCB REV-0    MFR ID-ce80
DIMM 2    VL31B5263F-F8SD DIE REV-0 PCB REV-0    MFR ID-ce80
DIMM 3    VL31B5263F-F8SD DIE REV-0 PCB REV-0    MFR ID-ce80
Routing Engine 1 REV 08    740-031116    9009124913    RE-S-1800x4
Jedec Code: 0x7fb0        EEPROM Version: 0x02
P/N:          740-031116    S/N:          9009124913
Assembly ID: 0x09c0        Assembly Version: 01.08
Date:         01-09-2013    Assembly Flags: 0x00
Version:      REV 08        CLEI Code:     COUCASKBAA
ID: RE-S-1800x4            FRU Model Number: RE-S-1800X4-16G-S
Board Information Record:
  Address 0x00: 54 32 30 32 37 44 42 2d 34 34 47 42 23 42 23 00
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 09 c0 01 08 52 45 56 20 30 38 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 33 31 31 31 36 00 00
  Address 0x20: 39 30 30 39 31 32 34 39 31 33 00 00 00 09 01 07
  Address 0x30: dd ff ff ff 54 32 30 32 37 44 42 2d 34 34 47 42
  Address 0x40: 23 42 23 00 01 43 4f 55 43 41 53 4b 42 41 41 52
  Address 0x50: 45 2d 53 2d 31 38 30 30 58 34 2d 31 36 47 2d 53
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 59 ff ff ff ff ff ff ff ff ff ff ff ff
ad0    3831 MB    UGB30SFA4000T1    SFA4000T1 0000106D Compact Flash
ad1    30533 MB   UGB94BPH32H0S1-KCI 11000052402    Disk 1
CB 0    REV 18    750-031391    CABF0579    Enhanced MX SCB

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Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N: 750-031391        S/N: CABF0579
Assembly ID: 0x09b0     Assembly Version: 01.18
Date: 04-15-2013       Assembly Flags: 0x00
Version: REV 18        CLEI Code: COUCASRBAA
ID: Enhanced MX SCB    FRU Model Number: SCBE-MX-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 09 b0 01 12 52 45 56 20 31 38 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 33 31 33 39 31 00 00
Address 0x20: 53 2f 4e 20 43 41 42 46 30 35 37 39 00 0f 04 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4f 55 43 41 53 52 42 41 41 53
Address 0x50: 43 42 45 2d 4d 58 2d 53 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 43 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 7d ff ff ff ff ff ff ff ff ff ff ff ff

CB 1      REV 16      750-031391      CAAZ2471      Enhanced MX SCB
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N: 750-031391        S/N: CAAZ2471
Assembly ID: 0x09b0     Assembly Version: 01.16
Date: 03-09-2013       Assembly Flags: 0x00
Version: REV 16        CLEI Code: COUCARCBAB
ID: Enhanced MX SCB    FRU Model Number: SCBE-MX-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 09 b0 01 10 52 45 56 20 31 36 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 33 31 33 39 31 00 00
Address 0x20: 53 2f 4e 20 43 41 41 5a 32 34 37 31 00 09 03 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4f 55 43 41 52 43 42 41 42 53
Address 0x50: 43 42 45 2d 4d 58 2d 53 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 42 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 6d ff ff ff ff ff ff ff ff ff ff ff ff

CB 2      REV 16      750-031391      CAAW9595      Enhanced MX SCB
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N: 750-031391        S/N: CAAW9595
Assembly ID: 0x09b0     Assembly Version: 01.16
Date: 02-01-2013       Assembly Flags: 0x00
Version: REV 16        CLEI Code: COUCARCBAB
ID: Enhanced MX SCB    FRU Model Number: SCBE-MX-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 09 b0 01 10 52 45 56 20 31 36 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 33 31 33 39 31 00 00
Address 0x20: 53 2f 4e 20 43 41 41 57 39 35 39 35 00 01 02 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4f 55 43 41 52 43 42 41 42 53
Address 0x50: 43 42 45 2d 4d 58 2d 53 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 42 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 6d ff ff ff ff ff ff ff ff ff ff ff ff

FPC 0      REV 18      750-046005      CACE6574      MPC5E 3D Q 2CGE+4XGE
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N: 750-046005        S/N: CACE6574
Assembly ID: 0x0b8c     Assembly Version: 01.18
Date: 11-20-2013       Assembly Flags: 0x00
Version: REV 18        CLEI Code: PROTOXCLEI
ID: MPC5E 3D Q 2CGE+4XGE FRU Model Number: PROTO-ASSEMBLY

```

```

Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 8c 01 12 52 45 56 20 31 38 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 34 36 30 30 35 00 00
Address 0x20: 53 2f 4e 20 43 41 43 45 36 35 37 34 00 14 0b 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff
CPU          REV 09    711-045719    CACG8908          RMPC PMB
Jedec Code:   0x7fb0          EEPROM Version:   0x02
P/N:          711-045719      S/N:            CACG8908
Assembly ID:  0x0b85          Assembly Version: 01.09
Date:         11-13-2013      Assembly Flags:  0x00
Version:      REV 09
ID: RMPC PMB
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 85 01 09 52 45 56 20 30 39 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 34 35 37 31 39 00 00
Address 0x20: 53 2f 4e 20 43 41 43 47 38 39 30 38 00 0d 0b 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 00 00 00 00 00 00 00 00 00 00 00 00
PIC 0          BUILTIN      BUILTIN          2X10GE SFPP OTN
Jedec Code:   0x0000          EEPROM Version:   0x00
P/N:          BUILTIN        S/N:            BUILTIN
Assembly ID:  0x0a90          Assembly Version: 00.00
Date:         00-00-0000      Assembly Flags:  0x00
ID: 2X10GE SFPP OTN
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a 90 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 c0 02 ae dc 00 00 00 00 0a 6e 00 00
Xcvr 0        REV 01    740-021308    AQA0DYT          SFP+-10G-SR
  Xcvr 1        REV 01    740-021308    AQG0MS7          SFP+-10G-SR
PIC 1          BUILTIN      BUILTIN          1X100GE CFP2 OTN
Jedec Code:   0x0000          EEPROM Version:   0x00
P/N:          BUILTIN        S/N:            BUILTIN
Assembly ID:  0x0a6e          Assembly Version: 00.00
Date:         00-00-0000      Assembly Flags:  0x00
ID: 1X100GE CFP2 OTN
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a 6e 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00

```

```

Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 c0 03 f3 8c 31 5c e7 80 00 00 00 02
Xcvr 0      REV 01  740-046563  XD16FC03Z      CFP2-100G-SR10
PIC 2      BUILTIN  BUILTIN      2X10GE SFPP OTN
Jedec Code: 0x0000      EEPROM Version: 0x00
P/N:      BUILTIN      S/N:      BUILTIN
Assembly ID: 0x0a90      Assembly Version: 00.00
Date:      00-00-0000      Assembly Flags: 0x00
ID: 2X10GE SFPP OTN
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a 90 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 c0 03 f5 6c 31 5c db 40 00 00 00 02
Xcvr 0      REV 01  740-021308  ANA0NAJ      SFP+-10G-SR
Xcvr 1      REV 01  740-021308  AQGOMRQ      SFP+-10G-SR
PIC 3      BUILTIN  BUILTIN      1X100GE CFP2 OTN
Jedec Code: 0x0000      EEPROM Version: 0x00
P/N:      BUILTIN      S/N:      BUILTIN
Assembly ID: 0x0a6e      Assembly Version: 00.00
Date:      00-00-0000      Assembly Flags: 0x00
ID: 1X100GE CFP2 OTN
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a 6e 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 c0 03 ed ec 31 5c e2 e8 00 00 00 02
Xcvr 0      REV 01  740-049775  J13K72993      CFP2-100G-LR4
FPC 1      REV 11  750-045372  CABK8154      MPCE Type 3 3D
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N:      750-045372      S/N:      CABK8154
Assembly ID: 0x09db      Assembly Version: 04.11
Date:      05-18-2013      Assembly Flags: 0x00
Version:      REV 11      CLEI Code:      COUIBBNBA
ID: MPCE Type 3 3D      FRU Model Number: MX-MPC3E-3D
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 09 db 04 0b 52 45 56 20 31 31 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 34 35 33 37 32 00 00
Address 0x20: 53 2f 4e 20 43 41 42 4b 38 31 35 34 00 12 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4f 55 49 42 42 4e 42 41 41 4d
Address 0x50: 58 2d 4d 50 43 33 45 2d 33 44 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 44 00 00 ff ff ff ff ff ff ff

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Address 0x70: ff ff ff cf ff ff ff ff ff ff ff ff ff ff ff
CPU          REV 08    711-035209    CABE7370    HMPC PMB 2G
Jedec Code:  0x7fb0    EEPROM Version: 0x01
P/N:         711-035209    S/N:         CABE7370
Assembly ID: 0x0b04    Assembly Version: 01.08
Date:        05-08-2013    Assembly Flags: 0x00
Version:     REV 08
ID: HMPC PMB 2G
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 0b 04 01 08 52 45 56 20 30 38 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 33 35 32 30 39 00 00
Address 0x20: 53 2f 4e 20 43 41 42 45 37 33 37 30 00 08 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff
Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
MIC 0        REV 07    750-033307    CABD5255    10X10GE SFPP
Jedec Code:  0x7fb0    EEPROM Version: 0x02
P/N:         750-033307    S/N:         CABD5255
Assembly ID: 0x0a2a    Assembly Version: 02.07
Date:        04-25-2013    Assembly Flags: 0x00
Version:     REV 07    CLEI Code:    COUIBBJBAA
ID: 10X10GE SFPP    FRU Model Number: MIC3-3D-10XGE-SFPP
Board Information Record:
Address 0x00: 34 01 03 03 05 ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 fe 0a 2a 02 07 52 45 56 20 30 37 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 33 33 33 30 37 00 00
Address 0x20: 53 2f 4e 20 43 41 42 44 35 32 35 35 00 19 04 07
Address 0x30: dd ff ff ff 34 01 03 03 05 ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4f 55 49 42 42 4a 42 41 41 4d
Address 0x50: 49 43 33 2d 33 44 2d 31 30 58 47 45 2d 53 46 50
Address 0x60: 50 00 00 00 00 00 41 00 00 ff ff ff ff ff ff
Address 0x70: ff ff ff 82 c0 03 f0 bc 57 79 83 80 00 00 00 02
PIC 0        BUILTIN    BUILTIN    10X10GE SFPP
Xcvr 0       REV 01    740-021308    AQ50319    SFP+-10G-SR
Xcvr 1       REV 01    740-021308    AQ5035V    SFP+-10G-SR
Xcvr 2       REV 01    740-021308    AQ502XJ    SFP+-10G-SR
Xcvr 3       REV 01    740-021308    AQ43HHR    SFP+-10G-SR
Xcvr 4       REV 01    740-021308    AQ502YA    SFP+-10G-SR
Xcvr 5       REV 01    740-021308    AQ502EU    SFP+-10G-SR
Xcvr 6       REV 01    740-021308    AQ502HR    SFP+-10G-SR
Xcvr 7       REV 01    740-021308    AQ502A6    SFP+-10G-SR
Xcvr 8       REV 01    740-021308    AQ43H8M    SFP+-10G-SR
MIC 1        REV 14    750-033196    CAAP1398    1X100GE CXP
Jedec Code:  0x7fb0    EEPROM Version: 0x02
P/N:         750-033196    S/N:         CAAP1398
Assembly ID: 0x0a29    Assembly Version: 03.14
Date:        10-27-2012    Assembly Flags: 0x00
Version:     REV 14    CLEI Code:    COUIBBKBAA
ID: 1X100GE CXP    FRU Model Number: MIC3-3D-1X100GE-CXP
Board Information Record:
Address 0x00: 34 01 07 07 08 ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 fe 0a 29 03 0e 52 45 56 20 31 34 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 33 33 31 39 36 00 00
Address 0x20: 53 2f 4e 20 43 41 41 50 31 33 39 38 00 1b 0a 07

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Address 0x30: dc ff ff ff 34 01 07 07 08 ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4f 55 49 42 42 4b 42 41 41 4d
Address 0x50: 49 43 33 2d 33 44 2d 31 58 31 30 30 47 45 2d 43
Address 0x60: 58 50 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 96 c0 03 ef cc 57 79 85 08 00 00 00 02
PIC 2 BUILTIN BUILTIN 1X100GE CXP
Xcvr 0 REV 01 740-046563 XD16FC064 CFP2-100G-SR10
FPC 3 REV 35 750-028467 CAAT9156 MPC 3D 16x 10GE
Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 750-028467 S/N: CAAT9156
Assembly ID: 0x0997 Assembly Version: 01.35
Date: 12-17-2012 Assembly Flags: 0x00
Version: REV 35
ID: MPC 3D 16x 10GE FRU Model Number: MPC-3D-16XGE-SFPP
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 09 97 01 23 52 45 56 20 33 35 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 32 38 34 36 37 00 00
Address 0x20: 53 2f 4e 20 43 41 41 54 39 31 35 36 00 11 0c 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 00 4d
Address 0x50: 50 43 2d 33 44 2d 31 36 58 47 45 2d 53 46 50 50
Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
CPU REV 11 711-029089 CAAV4645 AMPC PMB
Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 711-029089 S/N: CAAV4645
Assembly ID: 0x0998 Assembly Version: 01.11
Date: 12-13-2012 Assembly Flags: 0x00
Version: REV 11
ID: AMPC PMB
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 09 98 01 0b 52 45 56 20 31 31 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 32 39 30 38 39 00 00
Address 0x20: 53 2f 4e 20 43 41 41 56 34 36 34 35 00 0d 0c 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
PIC 0 BUILTIN BUILTIN 4x 10GE(LAN) SFP+
Jedec Code: 0x0000 EEPROM Version: 0x00
P/N: BUILTIN S/N: BUILTIN
Assembly ID: 0x02fe Assembly Version: 00.00
Date: 00-00-0000 Assembly Flags: 0x00
ID: 4x 10GE(LAN) SFP+
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 02 fe 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 c0 02 6b 94 00 00 00 00 02 fe 00 00

```



```

Xcvr 0      REV 01  740-021308  AQ43HZ1      SFP+-10G-SR
Xcvr 1      REV 01  740-021308  AQ43HZC      SFP+-10G-SR
Xcvr 2      REV 01  740-021308  AQ43HD2      SFP+-10G-SR
Xcvr 3      REV 01  740-021308  AQ502HN      SFP+-10G-SR
PIC 1              BUILTIN      BUILTIN      4x 10GE(LAN) SFP+
Jedec Code: 0x0000      EEPROM Version: 0x00
P/N:         BUILTIN      S/N:         BUILTIN
Assembly ID: 0x02fe      Assembly Version: 00.00
Date:        00-00-0000   Assembly Flags: 0x00
ID: 4x 10GE(LAN) SFP+
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 02 fe 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 c0 02 ac 0c 00 00 00 00 02 fe 00 00
Xcvr 0      REV 01  740-021308  AQ43HGF      SFP+-10G-SR
Xcvr 1      REV 01  740-021308  AQ501RZ      SFP+-10G-SR
Xcvr 2      REV 01  740-021308  AQ5029V      SFP+-10G-SR
Xcvr 3      REV 01  740-021308  AQ501X9      SFP+-10G-SR
PIC 2              BUILTIN      BUILTIN      4x 10GE(LAN) SFP+
Jedec Code: 0x0000      EEPROM Version: 0x00
P/N:         BUILTIN      S/N:         BUILTIN
Assembly ID: 0x02fe      Assembly Version: 00.00
Date:        00-00-0000   Assembly Flags: 0x00
.....

```

### show chassis hardware models (MX960 Router with MPC5EQ)

```
user@host> show chassis hardware models
```

```

Hardware inventory:
Item          Version  Part number  Serial number  FRU model number
Midplane      REV 01   710-030012  ACAX3674      CHAS-BP-MX960-S
FPM Board     REV 03   710-014974  CAAZ9326      CRAFT-MX960-S
PEM 0         Rev 10   740-027760  QCS1702N062   PWR-MX960-4100-AC-S
PEM 1         Rev 04   740-027760  QCS1422N02C   PWR-MX960-4100-AC-S
PEM 2         Rev 09   740-027760  QCS1614N01X   PWR-MX960-4100-AC-S
Routing Engine 0 REV 08   740-031116  9009131803    RE-S-1800X4-16G-S
Routing Engine 1 REV 08   740-031116  9009124913    RE-S-1800X4-16G-S
CB 0          REV 18   750-031391  CABF0579      SCBE-MX-S
CB 1          REV 16   750-031391  CAAZ2471      SCBE-MX-S
CB 2          REV 16   750-031391  CAAW9595      SCBE-MX-S
FPC 0         REV 18   750-046005  CACE6574      PROTO-ASSEMBLY
FPC 1         REV 11   750-045372  CABK8154      MX-MPC3E-3D
  MIC 0       REV 07   750-033307  CABD5255      MIC3-3D-10XGE-SFPP
  MIC 1       REV 14   750-033196  CAAP1398      MIC3-3D-1X100GE-CXP
FPC 3         REV 35   750-028467  CAAT9156      MPC-3D-16XGE-SFPP
FPC 4         REV 18   750-046005  CACE6568      PROTO-ASSEMBLY
FPC 5         REV 18   750-046005  CACE6577      PROTO-ASSEMBLY
FPC 7         REV 09   750-037355  CAAF0937      MPC4E-2CGE-8XGE
FPC 8         REV 39   750-045715  CACD1903      PROTO-ASSEMBLY
FPC 9         REV 05   750-044444  CAAY9801      MX-MPC2E-3D-P
  MIC 0       REV 28   750-028387  CAAX1071      MIC-3D-4XGE-XFP
FPC 10        REV 21.0.11 750-045715  CAAY3541      PROTO-ASSEMBLY

```

FPC 11	REV 17	750-037355	CAAT3986	MPC4E-3D-2CGE-8XGE
Fan Tray 0	REV 08	740-031521	ACAF4219	FFANTRAY-MX960-HC-S
Fan Tray 1	REV 08	740-031521	ACAF4225	FFANTRAY-MX960-HC-S

### show chassis hardware clei-models (MX960 Router with MPC5EQ)

```
user@host> show chassis hardware clei-models
```

Hardware inventory:				
Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 01	710-030012	COM8T00CRB	CHAS-BP-MX960-S
FPM Board	REV 03	710-014974		CRAFT-MX960-S
PEM 0	Rev 10	740-027760		PWR-MX960-4100-AC-S
PEM 1	Rev 04	740-027760		PWR-MX960-4100-AC-S
PEM 2	Rev 09	740-027760		PWR-MX960-4100-AC-S
Routing Engine 0	REV 08	740-031116	COUCASKBAA	RE-S-1800X4-16G-S
Routing Engine 1	REV 08	740-031116	COUCASKBAA	RE-S-1800X4-16G-S
CB 0	REV 18	750-031391	COUCASRBAA	SCBE-MX-S
CB 1	REV 16	750-031391	COUCARCBAB	SCBE-MX-S
CB 2	REV 16	750-031391	COUCARCBAB	SCBE-MX-S
FPC 0	REV 18	750-046005	PROTOXCLEI	PROTO-ASSEMBLY
FPC 1	REV 11	750-045372	COUIBBNBAA	MX-MPC3E-3D
MIC 0	REV 07	750-033307	COUIBBJBAA	MIC3-3D-10XGE-SFPP
MIC 1	REV 14	750-033196	COUIBBKBAA	MIC3-3D-1X100GE-CXP
FPC 3	REV 35	750-028467		MPC-3D-16XGE-SFPP
FPC 4	REV 18	750-046005	PROTOXCLEI	PROTO-ASSEMBLY
FPC 5	REV 18	750-046005	PROTOXCLEI	PROTO-ASSEMBLY
FPC 7	REV 09	750-037355	PROTOXCLEI	MPC4E-2CGE-8XGE
FPC 8	REV 39	750-045715	PROTOXCLEI	PROTO-ASSEMBLY
FPC 9	REV 05	750-044444	COUIBBGBAA	MX-MPC2E-3D-P
MIC 0	REV 28	750-028387	COUIA16BAA	MIC-3D-4XGE-XFP
FPC 10	REV 21.0.11	750-045715	PROTOXCLEI	PROTO-ASSEMBLY
FPC 11	REV 17	750-037355	IPU3A4DHAA	MPC4E-3D-2CGE-8XGE
Fan Tray 0	REV 08	740-031521		FFANTRAY-MX960-HC-S
Fan Tray 1	REV 08	740-031521		FFANTRAY-MX960-HC-S

### show chassis hardware (MX960 Router with MPC3E and 100-Gigabit DWDM OTN MIC)

```
user@host> show chassis hardware
```

Hardware inventory:				
Item	Version	Part number	Serial number	Description
Chassis			JN123F6D9AFA	MX960
Midplane	REV 04	750-047849	ACRC8764	Enhanced MX960 Backplane
FPM Board	REV 03	710-014974	CACS4395	Front Panel Display
PDM	Rev 03	740-013110	QCS1809500Z	Power Distribution Module
PEM 0	Rev 08	740-029344	QCS1817V0LK	DC 4.1kW Power Entry
Module				
PEM 1	Rev 08	740-029344	QCS1814V01F	DC 4.1kW Power Entry
Module				
PEM 2	Rev 08	740-029344	QCS1810V1EW	DC 4.1kW Power Entry
Module				
PEM 3	Rev 08	740-029344	QCS1810V1K5	DC 4.1kW Power Entry
Module				
Routing Engine 0	REV 11	740-031116	9013103483	RE-S-1800x4
Routing Engine 1	REV 10	740-031116	9009198513	RE-S-1800x4
CB 0	REV 23	750-031391	CADW3218	Enhanced MX SCB
CB 1	REV 14	750-031391	ABBK5220	Enhanced MX SCB
FPC 1	REV 14	750-045372	CADK0464	MPCE Type 3 3D

CPU	REV 10	711-035209	CADM9839	HMPC PMB 2G
MIC 0	REV 19	750-033199	CAAE5870	1X100GE CFP
PIC 0		BUILTIN	BUILTIN	1X100GE CFP
Xcvr 0	REV 01	740-032210	UTHOH0W	CFP-100G-LR4
FPC 2	REV 14	750-045372	CADN3262	MPCE Type 3 3D
CPU	REV 10	711-035209	CADN8129	HMPC PMB 2G
FPC 3	REV 14	750-045372	CADH0146	MPCE Type 3 3D
CPU	REV 10	711-035209	CADT2458	HMPC PMB 2G
MIC 0	REV 03	750-057666	CADP1386	1X100GE DWDM CFP2-ACO
PIC 0		BUILTIN	BUILTIN	1X100GE DWDM CFP2-ACO
Xcvr 0	REV 01	740-062357	SMD5136.1	OTN-100G-LH
FPC 4	REV 18	750-045372	CAEV5668	MPCE Type 3 3D
CPU	REV 10	711-035209	CAET7827	HMPC PMB 2G
FPC 7	REV 14	750-045372	CADJ1947	MPCE Type 3 3D
CPU	REV 10	711-035209	CADJ1561	HMPC PMB 2G
MIC 0	REV 05	750-057666	CAEB5763	1X100GE DWDM CFP2-ACO
PIC 0		BUILTIN	BUILTIN	1X100GE DWDM CFP2-ACO
Xcvr 0	REV 01	740-062357	1DJBZ052002	OTN-100G-LH
FPC 8	REV 14	750-045372	CADK0485	MPCE Type 3 3D
CPU	REV 10	711-035209	CADM9828	HMPC PMB 2G
MIC 0	REV 03	750-057666	CADP1390	1X100GE DWDM CFP2-ACO
PIC 0		BUILTIN	BUILTIN	1X100GE DWDM CFP2-ACO
FPC 9	REV 14	750-045372	CADJ1936	MPCE Type 3 3D
CPU	REV 10	711-035209	CADJ1566	HMPC PMB 2G
MIC 0	REV 14	750-057666	CAFF7544	1X100GE DWDM CFP2-ACO
PIC 0		BUILTIN	BUILTIN	1X100GE DWDM CFP2-ACO
Xcvr 0	REV 01	740-062357	1DJBZ05100K	OTN-100G-LH
FPC 10	REV 14	750-054901	CADJ3846	MPC3E NG HQoS
CPU	REV 11	711-045719	CADN5471	RMPC PMB
MIC 0	REV 05	750-057666	CAEB5760	1X100GE DWDM CFP2-ACO
PIC 0		BUILTIN	BUILTIN	1X100GE DWDM CFP2-ACO
Xcvr 0	REV 01	740-062357	SMD5091.1	CFP-Loopback
Fan Tray 0	REV 08	740-031521	ACDB4083	Enhanced Fan Tray
Fan Tray 1	REV 08	740-031521	ACDB3995	Enhanced Fan Tray

### show chassis hardware clei-models(MX960 Router with MPC3E and 100-Gigabit DWDM OTN MIC)

```
user@host> show chassis hardware clei-models
```

#### Hardware inventory:

Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 04	750-047849	CMMJA10BRA	CHAS-BP3-MX960-S
FPM Board	REV 03	710-014974		CRAFT-MX960-S
PEM 0	Rev 08	740-029344		PWR-MX960-4100-DC-S
PEM 1	Rev 08	740-029344		PWR-MX960-4100-DC-S
PEM 2	Rev 08	740-029344		PWR-MX960-4100-DC-S
PEM 3	Rev 08	740-029344		PWR-MX960-4100-DC-S
Routing Engine 0	REV 11	740-031116	COUCASYBAB	RE-S-1800X4-16G-S
Routing Engine 1	REV 10	740-031116	COUCASYBAA	RE-S-1800X4-16G-S
CB 0	REV 23	750-031391	COUCATXBAA	SCBE-MX-S
CB 1	REV 14	750-031391	COUCARCBA	SCBE-MX-S
FPC 1	REV 14	750-045372	COUIBBNBAB	MX-MPC3E-3D
MIC 0	REV 19	750-033199	COUIBA8BAA	MIC3-3D-1X100GE-CFP
FPC 2	REV 14	750-045372	COUIBBNBAB	MX-MPC3E-3D
FPC 3	REV 14	750-045372	COUIBBNBAB	MX-MPC3E-3D
MIC 0	REV 03	750-057666	PROTOXCLEI	PROTO-ASSEMBLY
FPC 4	REV 18	750-045372	COUIBBNBAC	MX-MPC3E-3D
FPC 7	REV 14	750-045372	COUIBBNBAB	MX-MPC3E-3D
MIC 0	REV 05	750-057666	PROTOXCLEI	PROTO-ASSEMBLY
FPC 8	REV 14	750-045372	COUIBBNBAB	MX-MPC3E-3D

MIC 0	REV 03	750-057666	PROTOXCLEI	PROTO-ASSEMBLY
FPC 9	REV 14	750-045372	COUIBBNBAB	MX-MPC3E-3D
MIC 0	REV 14	750-057666	PROTOXCLEI	PROTO-ASSEMBLY
FPC 10	REV 14	750-054901	PROTOXCLEI	PROTO-ASSEMBLY
MIC 0	REV 05	750-057666	PROTOXCLEI	PROTO-ASSEMBLY
Fan Tray 0	REV 08	740-031521		FFANTRAY-MX960-HC-S
Fan Tray 1	REV 08	740-031521		FFANTRAY-MX960-HC-S

### show chassis hardware (MX10008 Router)

```
user@host> show chassis hardware
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			DE487	JNP10008 [MX10008]
Midplane	REV 27	750-054097	ACPD4307	Midplane 8
Routing Engine 0		BUILTIN	BUILTIN	RE X10 LT
Routing Engine 1		BUILTIN	BUILTIN	RE X10
CB 0	REV 02	750-079563	CAFF4580	Control Board
CB 1	REV 04	750-079563	CAGL8034	Control Board
...				
...				
...				
FPC 3	REV 04	750-084779	CAKR7019	JNP10K-LC2101
CPU	REV 05	750-073391	CAKJ2854	LC 2101 PMB
PIC 0		BUILTIN	BUILTIN	4xQSFP28 SYNCE
Xcvr 0	REV 01	740-058734	1ACQ104300K	QSFP-100GBASE-SR4
PIC 1		BUILTIN	BUILTIN	4xQSFP28 SYNCE
Xcvr 0	REV 01	740-061405	1ACQ12110AN	QSFP-100GBASE-SR4
PIC 2		BUILTIN	BUILTIN	4xQSFP28 SYNCE
Xcvr 0	REV 01	740-046565	QG1105B2	QSFP+-40G-SR4
PIC 3		BUILTIN	BUILTIN	4xQSFP28 SYNCE
Xcvr 0	REV 01	740-045627	QH08036X	40GBASE eSR4
PIC 4		BUILTIN	BUILTIN	4xQSFP28 SYNCE
Xcvr 0	REV 01	740-067443	XWRORY7	QSFP+-40G-SR4
Xcvr 1	REV 01	740-067443	XWRORYH	QSFP+-40G-SR4
Xcvr 2	REV 01	740-067443	XWRORYP	QSFP+-40G-SR4
Xcvr 3	REV 01	740-067443	XWS028S	QSFP+-40G-SR4
PIC 5		BUILTIN	BUILTIN	4xQSFP28 SYNCE
Xcvr 3	REV 01	740-058734	1ACQ113406C	QSFP-100GBASE-SR4
FPD Board	REV 07	711-054687	ACPC7142	Front Panel Display
PEM 0	REV 02	740-049388	1EDL62102N9	Power Supply AC
PEM 1	REV 02	740-049388	1EDL60300KX	Power Supply AC
PEM 2	REV 02	740-049388	1EDL60300DL	Power Supply AC
PEM 3	REV 02	740-049388	1EDL61701BT	Power Supply AC
PEM 4	REV 02	740-049388	1EDL62102P7	Power Supply AC
PEM 5	REV 02	740-049388	1EDL62102PP	Power Supply AC
FTC 0	REV 14	750-050108	ACPE4038	Fan Controller 8
FTC 1	REV 14	750-050108	ACPE4032	Fan Controller 8
Fan Tray 0	REV 09	760-054372	ACPD6799	Fan Tray 8
Fan Tray 1	REV 09	760-054372	ACNZ3584	Fan Tray 8
SFB 0	REV 24	750-050058	ACPD4587	Switch Fabric (SIB) 8
SFB 1	REV 24	750-050058	ACNZ0635	Switch Fabric (SIB) 8
SFB 2	REV 24	750-050058	ACPD4908	Switch Fabric (SIB) 8
SFB 3	REV 24	750-050058	ACNZ0617	Switch Fabric (SIB) 8
SFB 4	REV 24	750-050058	ACNZ0527	Switch Fabric (SIB) 8
SFB 5	REV 23	750-050058	ACNX6980	Switch Fabric (SIB) 8

## show chassis hardware clei-models (MX10008 Router)

user@host&gt; show chassis hardware clei-models

Hardware inventory:

Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 27	750-054097	CMMUM00ARA	QFX10008-CHAS
CB 0	REV 02	750-079563		
CB 1	REV 04	750-079563		
FPC 0	REV 12	750-073174	PROTOXCLEI	PROTO-ASSEMBLY
FPC 2	REV 03	750-073174	PROTOXCLEI	PROTO-ASSEMBLY
FPC 3	REV 04	750-084779	PROTOXCLEI	PROTO-ASSEMBLY
FPD Board	REV 07	711-054687		
PEM 0	REV 02	740-049388	CMUPADNBAA	QFX10000-PWR-AC
PEM 1	REV 02	740-049388	CMUPADNBAA	QFX10000-PWR-AC
PEM 2	REV 02	740-049388	CMUPADNBAA	QFX10000-PWR-AC
PEM 3	REV 02	740-049388	CMUPADNBAA	QFX10000-PWR-AC
PEM 4	REV 02	740-049388	CMUPADNBAA	QFX10000-PWR-AC
PEM 5	REV 02	740-049388	CMUPADNBAA	QFX10000-PWR-AC
FTC 0	REV 14	750-050108	CMUCAHZCAA	QFX10008-FAN-CTRL
FTC 1	REV 14	750-050108	CMUCAHZCAA	QFX10008-FAN-CTRL
Fan Tray 0	REV 09	760-054372	CMUCAHYCAA	QFX10008-FAN
Fan Tray 1	REV 09	760-054372	CMUCAHYCAA	QFX10008-FAN
SFB 0	REV 24	750-050058	CMUCAHOCOA	QFX10008-SF
SFB 1	REV 24	750-050058	CMUCAHOCOA	QFX10008-SF
SFB 2	REV 24	750-050058	CMUCAHOCOA	QFX10008-SF
SFB 3	REV 24	750-050058	CMUCAHOCOA	QFX10008-SF
SFB 4	REV 24	750-050058	CMUCAHOCOA	QFX10008-SF
SFB 5	REV 23	750-050058	CMUCAHOCOA	QFX10008-SF

## show chassis hardware detail (MX10008 Router)

user@host&gt; show chassis hardware detail

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			DE487	JNP10008 [MX10008]
Midplane	REV 27	750-054097	ACPD4307	Midplane 8
Routing Engine 0		BUILTIN	BUILTIN	RE X10 LT
vtbd0 17408 MB				Virtio Block Disk
vtbd1 57344 MB				Virtio Block Disk
vtbd2 12288 MB				Virtio Block Disk
ada0 128 MB QEMU			QM00002	Virtio Block Disk
usb0 (addr 0.1) XHCI root HUB 0			0x8086	uhub0
Routing Engine 1		BUILTIN	BUILTIN	RE X10
vtbd0 17408 MB				Virtio Block Disk
vtbd1 57344 MB				Virtio Block Disk
vtbd2 12288 MB				Virtio Block Disk
ada0 128 MB QEMU			QM00002	Virtio Block Disk
usb0 (addr 0.1) XHCI root HUB 0			0x8086	uhub0
CB 0	REV 02	750-079563	CAFF4580	Control Board
CB 1	REV 04	750-079563	CAGL8034	Control Board
FPC 0	REV 12	750-073174	CAJK0253	JNP10K-LC2102
CPU	REV 04	750-073391	CAKJ0761	LC 2101 PMB
PIC 0		BUILTIN	BUILTIN	4xQSFP28 MACSEC
Xcvr 0	REV 01	740-054053	QF4807XH	QSFP+-4X10G-SR
Xcvr 1	REV 01	740-046565	QF121734	QSFP+-40G-SR4
Xcvr 3	REV 01	740-067443	XWS027R	QSFP+-40G-SR4
PIC 1		BUILTIN	BUILTIN	4xQSFP28 MACSEC
Xcvr 0	REV 01	740-045627	QH080366	40GBASE eSR4

Xcvr 1	REV 01	740-054053	XYJ0A4P	QSFP+-4X10G-SR
PIC 2		BUILTIN	BUILTIN	4xQSFP28 MACSEC
Xcvr 0	REV 01	740-058734	1ACQ113404E	QSFP-100GBASE-SR4
PIC 3		BUILTIN	BUILTIN	4xQSFP28 MACSEC
Xcvr 0	REV 01	740-058734	1ACQ1041018	QSFP-100GBASE-SR4
Xcvr 1	REV 01	740-067443	XWS08JK	QSFP+-40G-SR4
Xcvr 2	REV 01	740-032986	QF340C63	QSFP+-40G-SR4
Xcvr 3	REV 01	740-067443	XWS08JL	QSFP+-40G-SR4
PIC 4		BUILTIN	BUILTIN	4xQSFP28 MACSEC
Xcvr 0		NON-JNPR	37700171YY0083	QSFP-100GBASE-LR4
PIC 5		BUILTIN	BUILTIN	4xQSFP28 MACSEC
Xcvr 0	REV 01	740-032986	QE201294	QSFP+-40G-SR4
Xcvr 1	REV 01	740-046565	QH0603VK	QSFP+-40G-SR4
Xcvr 2	REV 01	740-046565	QD510321	QSFP+-40G-SR4
Xcvr 3	REV 01	740-054053	QF3208KP	QSFP+-4X10G-SR
FPC 2	REV 03	750-073174	CAJB6004	JNP10K-LC2102
CPU	REV 01	750-073391	CAHM7956	LC 2101 PMB
PIC 0		BUILTIN	BUILTIN	4xQSFP28 MACSEC
Xcvr 0	REV 01	740-061405	1ACQ12110JK	QSFP-100GBASE-SR4
PIC 1		BUILTIN	BUILTIN	4xQSFP28 MACSEC
Xcvr 0	REV 01	740-046565	XYH0P6F	QSFP+-40G-SR4
PIC 2		BUILTIN	BUILTIN	4xQSFP28 MACSEC
Xcvr 0	REV 01	740-067442	XX401TT	QSFP+-40G-SR4
Xcvr 1	REV 01	740-067443	XV3002D	QSFP+-40G-SR4
Xcvr 2	REV 01	740-067442	XX401SL	QSFP+-40G-SR4
Xcvr 3	REV 01	740-067443	XV30A78	QSFP+-40G-SR4
PIC 3		BUILTIN	BUILTIN	4xQSFP28 MACSEC
Xcvr 0	REV 01	740-067442	XX401T2	QSFP+-40G-SR4
Xcvr 1	REV 01	740-067442	XX401SZ	QSFP+-40G-SR4
PIC 4		BUILTIN	BUILTIN	4xQSFP28 MACSEC
Xcvr 0	REV 01	740-061405	1ACQ12110JS	QSFP-100GBASE-SR4
Xcvr 1	REV 01	740-061405	1ACQ12110JP	QSFP-100GBASE-SR4
Xcvr 2	REV 01	740-061405	1ACQ12110JQ	QSFP-100GBASE-SR4
Xcvr 3	REV 01	740-061405	1ACQ121109R	QSFP-100GBASE-SR4
PIC 5		BUILTIN	BUILTIN	4xQSFP28 MACSEC
Xcvr 0	REV 01	740-061405	1ACQ121109P	QSFP-100GBASE-SR4
Xcvr 1	REV 01	740-061405	1ACQ12110JC	QSFP-100GBASE-SR4
FPC 3	REV 04	750-084779	CAKR7019	JNP10K-LC2101
CPU	REV 05	750-073391	CAKJ2854	LC 2101 PMB
PIC 0		BUILTIN	BUILTIN	4xQSFP28 SYNCE
Xcvr 0	REV 01	740-058734	1ACQ104300K	QSFP-100GBASE-SR4
PIC 1		BUILTIN	BUILTIN	4xQSFP28 SYNCE
Xcvr 0	REV 01	740-061405	1ACQ12110AN	QSFP-100GBASE-SR4
PIC 2		BUILTIN	BUILTIN	4xQSFP28 SYNCE
Xcvr 0	REV 01	740-046565	QG1105B2	QSFP+-40G-SR4
PIC 3		BUILTIN	BUILTIN	4xQSFP28 SYNCE
Xcvr 0	REV 01	740-045627	QH08036X	40GBASE eSR4
PIC 4		BUILTIN	BUILTIN	4xQSFP28 SYNCE
Xcvr 0	REV 01	740-067443	XWRORY7	QSFP+-40G-SR4
Xcvr 1	REV 01	740-067443	XWRORYH	QSFP+-40G-SR4
Xcvr 2	REV 01	740-067443	XWRORYP	QSFP+-40G-SR4
Xcvr 3	REV 01	740-067443	XWS028S	QSFP+-40G-SR4
PIC 5		BUILTIN	BUILTIN	4xQSFP28 SYNCE
Xcvr 3	REV 01	740-058734	1ACQ113406C	QSFP-100GBASE-SR4
FPD Board	REV 07	711-054687	ACPC7142	Front Panel Display
PEM 0	REV 02	740-049388	1EDL62102N9	Power Supply AC
PEM 1	REV 02	740-049388	1EDL60300KX	Power Supply AC
PEM 2	REV 02	740-049388	1EDL60300DL	Power Supply AC
PEM 3	REV 02	740-049388	1EDL61701BT	Power Supply AC
PEM 4	REV 02	740-049388	1EDL62102P7	Power Supply AC

PEM 5	REV 02	740-049388	1EDL62102PP	Power Supply AC
FTC 0	REV 14	750-050108	ACPE4038	Fan Controller 8
FTC 1	REV 14	750-050108	ACPE4032	Fan Controller 8
Fan Tray 0	REV 09	760-054372	ACPD6799	Fan Tray 8
Fan Tray 1	REV 09	760-054372	ACNZ3584	Fan Tray 8
SFB 0	REV 24	750-050058	ACPD4587	Switch Fabric (SIB) 8
SFB 1	REV 24	750-050058	ACNZ0635	Switch Fabric (SIB) 8
SFB 2	REV 24	750-050058	ACPD4908	Switch Fabric (SIB) 8
SFB 3	REV 24	750-050058	ACNZ0617	Switch Fabric (SIB) 8
SFB 4	REV 24	750-050058	ACNZ0527	Switch Fabric (SIB) 8
SFB 5	REV 23	750-050058	ACNX6980	Switch Fabric (SIB) 8

### show chassis hardware extensive(MX10008 Router)

```
user@host> show chassis hardware extensive
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			DE487	JNP10008 [MX10008]

Jedec Code:	0x7fb0	EEPROM Version:	0x02
		S/N:	DE487
Assembly ID:	0x0566	Assembly Version:	01.27
Date:	08-08-2016	Assembly Flags:	0x00
		CLEI Code:	CMMUM00ARA
ID: JNP10008		FRU Model Number:	QFX10008-CHAS

Board Information Record:

Address 0x00: ad 01 08 00 30 b6 4f e9 74 c4 ff ff ff ff ff ff

I2C Hex Data:

Address 0x00: 7f b0 02 ff 05 66 01 1b 00 45 56 20 32 37 00 00  
 Address 0x10: 00 00 00 00 00 35 30 2d 30 35 34 30 39 37 00 00  
 Address 0x20: 44 45 34 38 37 00 00 00 00 00 00 00 00 08 08 07  
 Address 0x30: e0 ff ff ff ad 01 08 00 30 b6 4f e9 74 c4 ff ff  
 Address 0x40: ff ff ff ff 01 43 4d 4d 55 4d 30 30 41 52 41 51  
 Address 0x50: 46 58 31 30 30 30 38 2d 43 48 41 53 00 00 00 00  
 Address 0x60: 00 00 00 00 00 00 00 41 44 00 ff ff ff ff ff ff  
 Address 0x70: ff ff ff 63 44 45 34 38 37 00 00 00 00 00 00 00

Midplane	REV 27	750-054097	ACPD4307	Midplane 8
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Jedec Code:	0x7fb0	EEPROM Version:	0x02
P/N:	750-054097	S/N:	ACPD4307
Assembly ID:	0x0be3	Assembly Version:	01.27
Date:	08-08-2016	Assembly Flags:	0x00
Version:	REV 27	CLEI Code:	CMMUM00ARA
ID: Midplane 8		FRU Model Number:	QFX10008-CHAS

Board Information Record:

Address 0x00: ad 01 08 00 30 b6 4f e9 74 c4 ff ff ff ff ff ff

I2C Hex Data:

Address 0x00: 7f b0 02 ff 0b e3 01 1b 52 45 56 20 32 37 00 00  
 Address 0x10: 00 00 00 00 37 35 30 2d 30 35 34 30 39 37 00 00  
 Address 0x20: 53 2f 4e 20 41 43 50 44 34 33 30 37 00 08 08 07  
 Address 0x30: e0 ff ff ff ad 01 08 00 30 b6 4f e9 74 c4 ff ff  
 Address 0x40: ff ff ff ff 01 43 4d 4d 55 4d 30 30 41 52 41 51  
 Address 0x50: 46 58 31 30 30 30 38 2d 43 48 41 53 00 00 00 00  
 Address 0x60: 00 00 00 00 00 00 00 41 44 00 ff ff ff ff ff ff  
 Address 0x70: ff ff ff 63 44 45 34 38 37 00 00 00 00 00 00 00

Routing Engine 0	BUILTIN	BUILTIN	RE X10 LT
vtbd0 17408 MB			Virtio Block Disk
vtbd1 57344 MB			Virtio Block Disk
vtbd2 12288 MB			Virtio Block Disk
ada0 128 MB QEMU		QM00002	Virtio Block Disk
usb0 (addr 0.1) XHCI root HUB 0		0x8086	uhub0

```

Routing Engine 1          BUILTIN          BUILTIN          RE X10
vtbd0 17408 MB            Virtio Block Disk
vtbd1 57344 MB            Virtio Block Disk
vtbd2 12288 MB            Virtio Block Disk
ada0 128 MB QEMU          QM00002          Virtio Block Disk
usb0 (addr 0.1) XHCI root HUB 0 0x8086      uhub0
CB 0          REV 02 750-079563 CAFF4580      Control Board
Jedec Code: 0x7fb0          EEPROM Version: 0x01
P/N: 750-079563          S/N: CAFF4580
Assembly ID: 0x0ca3          Assembly Version: 01.02
Date: 06-06-2016          Assembly Flags: 0x00
Version: REV 02
ID: Control Board
Board Information Record:
Address 0x00: ad 01 00 40 4c 16 fc 91 7c 85 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 fe 0c a3 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 37 39 35 36 33 00 00
Address 0x20: 53 2f 4e 20 43 41 46 46 34 35 38 30 00 06 06 07
Address 0x30: e0 fe ff ff ad 01 00 40 4c 16 fc 91 7c 85 ff ff
Address 0x40: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
CB 1          REV 04 750-079563 CAGL8034      Control Board
Jedec Code: 0x7fb0          EEPROM Version: 0x01
P/N: 750-079563          S/N: CAGL8034
Assembly ID: 0x0ca3          Assembly Version: 01.04
Date: 06-28-2018          Assembly Flags: 0x00
Version: REV 04
ID: Control Board
Board Information Record:
Address 0x00: ad 01 00 40 4c 16 fc 91 7c c5 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 fe 0c a3 01 04 52 45 56 20 30 34 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 37 39 35 36 33 00 00
Address 0x20: 53 2f 4e 20 43 41 47 4c 38 30 33 34 00 1c 06 07
Address 0x30: e2 fc ff ff ad 01 00 40 4c 16 fc 91 7c c5 ff ff
Address 0x40: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPC 0          REV 12 750-073174 CAJK0253      JNP10K-LC2102
Jedec Code: 0x7fb0          EEPROM Version: 0x02
P/N: 750-073174          S/N: CAJK0253
Assembly ID: 0x0ca5          Assembly Version: 01.12
Date: 09-28-2017          Assembly Flags: 0x00
Version: REV 12          CLEI Code: PROTOXCLEI
ID: JNP10K-LC2102          FRU Model Number: PROTO-ASSEMBLY
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0c a5 01 0c 52 45 56 20 31 32 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 37 33 31 37 34 00 00
Address 0x20: 53 2f 4e 20 43 41 4a 4b 30 32 35 33 00 1c 09 07
Address 0x30: e1 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff

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CPU          REV 04   750-073391   CAKJ0761           LC 2101 PMB
Jedec Code:  0x7fb0           EEPROM Version:  0x02
P/N:         750-073391       S/N:           CAKJ0761
Assembly ID: 0x0cda          Assembly Version: 01.04
Date:        01-22-2018      Assembly Flags: 0x00
Version:     REV 04
ID: LC 2101 PMB
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0c da 01 04 52 45 56 20 30 34 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 37 33 33 39 31 00 00
Address 0x20: 53 2f 4e 20 43 41 4b 4a 30 37 36 31 00 16 01 07
Address 0x30: e2 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 00 00 00 00 00 00 00 00 00 00 00 00
PIC 0          BUILTIN      BUILTIN      4xQSFP28 MACSEC
Jedec Code:    0x0000           EEPROM Version:  0x00
P/N:           BUILTIN          S/N:           BUILTIN
Assembly ID:   0x0af1          Assembly Version: 00.00
Date:          00-00-0000      Assembly Flags:  0x00
ID: 4x QSFP28 10/40/100GE MACSec PIC
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a f1 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 83 00 d1 f1 00 00 00 00 0a f1 00 00
Xcvr 0        REV 01   740-054053   QF4807XH           QSFP+-4X10G-SR
Xcvr 1        REV 01   740-046565   QF121734           QSFP+-40G-SR4
Xcvr 3        REV 01   740-067443   XWS027R            QSFP+-40G-SR4
PIC 1          BUILTIN      BUILTIN      4xQSFP28 MACSEC
Jedec Code:    0x0000           EEPROM Version:  0x00
P/N:           BUILTIN          S/N:           BUILTIN
Assembly ID:   0x0af1          Assembly Version: 00.00
Date:          00-00-0000      Assembly Flags:  0x00
ID: 4x QSFP28 10/40/100GE MACSec PIC
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a f1 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 83 80 b1 f3 00 00 00 00 0a f1 00 00
Xcvr 0        REV 01   740-045627   QH080366           40GBASE eSR4
Xcvr 1        REV 01   740-054053   XYJ0A4P            QSFP+-4X10G-SR
PIC 2          BUILTIN      BUILTIN      4xQSFP28 MACSEC
Jedec Code:    0x0000           EEPROM Version:  0x00
P/N:           BUILTIN          S/N:           BUILTIN

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Assembly ID: 0x0af1          Assembly Version: 00.00
Date: 00-00-0000          Assembly Flags: 0x00
ID: 4x QSFP28 10/40/100GE MACSec PIC
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a f1 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 83 80 73 e8 00 00 00 00 00 00 00 00
Xcvr 0          REV 01      740-058734      1ACQ113404E      QSFP-100GBASE-SR4
PIC 3          BUILTIN      BUILTIN      4xQSFP28 MACSEC
Jedec Code: 0x0000          EEPROM Version: 0x00
P/N: BUILTIN          S/N: BUILTIN
Assembly ID: 0x0af1          Assembly Version: 00.00
Date: 00-00-0000          Assembly Flags: 0x00
ID: 4x QSFP28 10/40/100GE MACSec PIC
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a f1 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 83 80 51 ea 00 00 00 00 0a f1 00 00
Xcvr 0          REV 01      740-058734      1ACQ1041018      QSFP-100GBASE-SR4
Xcvr 1          REV 01      740-067443      XWS08JK          QSFP+-40G-SR4
Xcvr 2          REV 01      740-032986      QF340C63        QSFP+-40G-SR4
Xcvr 3          REV 01      740-067443      XWS08JL          QSFP+-40G-SR4
PIC 4          BUILTIN      BUILTIN      4xQSFP28 MACSEC
Jedec Code: 0x0000          EEPROM Version: 0x00
P/N: BUILTIN          S/N: BUILTIN
Assembly ID: 0x0af1          Assembly Version: 00.00
Date: 00-00-0000          Assembly Flags: 0x00
ID: 4x QSFP28 10/40/100GE MACSec PIC
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a f1 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 83 80 31 ec 00 00 00 00 0a f1 00 00
Xcvr 0          NON-JNPR    37700171YY0083    QSFP-100GBASE-LR4
PIC 5          BUILTIN      BUILTIN      4xQSFP28 MACSEC
Jedec Code: 0x0000          EEPROM Version: 0x00
P/N: BUILTIN          S/N: BUILTIN
Assembly ID: 0x0af1          Assembly Version: 00.00
Date: 00-00-0000          Assembly Flags: 0x00
ID: 4x QSFP28 10/40/100GE MACSec PIC

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Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a f1 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 83 80 11 ee 00 00 00 00 0a f1 00 00
Xcvr 0      REV 01  740-032986  QE201294      QSFP+-40G-SR4
Xcvr 1      REV 01  740-046565  QH0603VK      QSFP+-40G-SR4
Xcvr 2      REV 01  740-046565  QD510321      QSFP+-40G-SR4
Xcvr 3      REV 01  740-054053  QF3208KP      QSFP+-4X10G-SR
FPC 2      REV 03  750-073174  CAJB6004      JNP10K-LC2102
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N:        750-073174  S/N:          CAJB6004
Assembly ID: 0x0ca5     Assembly Version: 01.03
Date:       06-20-2017  Assembly Flags: 0x00
Version:    REV 03     CLEI Code:    PROTOXCLEI
ID: JNP10K-LC2102     FRU Model Number: PROTO-ASSEMBLY

Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0c a5 01 03 52 45 56 20 30 33 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 37 33 31 37 34 00 00
Address 0x20: 53 2f 4e 20 43 41 4a 42 36 30 30 34 00 14 06 07
Address 0x30: e1 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff
CPU      REV 01  750-073391  CAHM7956      LC 2101 PMB
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N:        750-073391  S/N:          CAHM7956
Assembly ID: 0x0cda     Assembly Version: 01.01
Date:       05-08-2017  Assembly Flags: 0x00
Version:    REV 01
ID: LC 2101 PMB

Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0c da 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 37 33 33 39 31 00 00
Address 0x20: 53 2f 4e 20 43 41 48 4d 37 39 35 36 00 08 05 07
Address 0x30: e1 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 00 00 00 00 00 00 00 00 00 00 00 00
PIC 0      BUILTIN      BUILTIN      4xQSFP28 MACSEC
Jedec Code: 0x0000      EEPROM Version: 0x00
P/N:        BUILTIN     S/N:          BUILTIN
Assembly ID: 0x0af1     Assembly Version: 00.00
Date:       00-00-0000  Assembly Flags: 0x00
ID: 4x QSFP28 10/40/100GE MACSec PIC

Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:

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Address 0x00: 00 00 00 00 0a f1 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 83 00 d1 f1 00 00 00 00 0a f1 00 00
Xcvr 0      REV 01    740-061405    1ACQ12110JK    QSFP-100GBASE-SR4
PIC 1      BUILTIN    BUILTIN    4xQSFP28 MACSEC
Jedec Code: 0x0000    EEPROM Version: 0x00
P/N:        BUILTIN    S/N:        BUILTIN
Assembly ID: 0x0af1    Assembly Version: 00.00
Date:       00-00-0000    Assembly Flags: 0x00
ID: 4x QSFP28 10/40/100GE MACSec PIC
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a f1 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 83 80 b1 f3 00 00 00 00 0a f1 00 00
Xcvr 0      REV 01    740-046565    XYH0P6F    QSFP+-40G-SR4
PIC 2      BUILTIN    BUILTIN    4xQSFP28 MACSEC
Jedec Code: 0x0000    EEPROM Version: 0x00
P/N:        BUILTIN    S/N:        BUILTIN
Assembly ID: 0x0af1    Assembly Version: 00.00
Date:       00-00-0000    Assembly Flags: 0x00
ID: 4x QSFP28 10/40/100GE MACSec PIC
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a f1 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 83 80 73 e8 00 00 00 00 00 00 00 00
Xcvr 0      REV 01    740-067442    XX401TT    QSFP+-40G-SR4
Xcvr 1      REV 01    740-067443    XV3002D    QSFP+-40G-SR4
Xcvr 2      REV 01    740-067442    XX401SL    QSFP+-40G-SR4
Xcvr 3      REV 01    740-067443    XV30A78    QSFP+-40G-SR4
PIC 3      BUILTIN    BUILTIN    4xQSFP28 MACSEC
Jedec Code: 0x0000    EEPROM Version: 0x00
P/N:        BUILTIN    S/N:        BUILTIN
Assembly ID: 0x0af1    Assembly Version: 00.00
Date:       00-00-0000    Assembly Flags: 0x00
ID: 4x QSFP28 10/40/100GE MACSec PIC
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a f1 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00

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Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 83 80 51 ea 00 00 00 00 0a f1 00 00
  Xcvr 0      REV 01  740-067442  XX401T2      QSFP+-40G-SR4
  Xcvr 1      REV 01  740-067442  XX401SZ      QSFP+-40G-SR4
PIC 4        BUILTIN  BUILTIN      4xQSFP28 MACSEC
Jedec Code:  0x0000      EEPROM Version:  0x00
P/N:         BUILTIN      S/N:         BUILTIN
Assembly ID: 0x0af1      Assembly Version: 00.00
Date:        00-00-0000   Assembly Flags: 0x00
ID: 4x QSFP28 10/40/100GE MACSec PIC
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a f1 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 83 80 31 ec 00 00 00 00 0a f1 00 00
  Xcvr 0      REV 01  740-061405  1ACQ12110JS   QSFP-100GBASE-SR4
  Xcvr 1      REV 01  740-061405  1ACQ12110JP   QSFP-100GBASE-SR4
  Xcvr 2      REV 01  740-061405  1ACQ12110JQ   QSFP-100GBASE-SR4
  Xcvr 3      REV 01  740-061405  1ACQ121109R   QSFP-100GBASE-SR4
PIC 5        BUILTIN  BUILTIN      4xQSFP28 MACSEC
Jedec Code:  0x0000      EEPROM Version:  0x00
P/N:         BUILTIN      S/N:         BUILTIN
Assembly ID: 0x0af1      Assembly Version: 00.00
Date:        00-00-0000   Assembly Flags: 0x00
ID: 4x QSFP28 10/40/100GE MACSec PIC
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a f1 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 83 80 11 ee 00 00 00 00 0a f1 00 00
  Xcvr 0      REV 01  740-061405  1ACQ121109P   QSFP-100GBASE-SR4
  Xcvr 1      REV 01  740-061405  1ACQ12110JC   QSFP-100GBASE-SR4
FPC 3        REV 04  750-084779  CAKR7019      JNP10K-LC2101
Jedec Code:  0x7fb0      EEPROM Version:  0x02
P/N:         750-084779   S/N:         CAKR7019
Assembly ID: 0x0cff      Assembly Version: 01.04
Date:        03-11-2018   Assembly Flags: 0x00
Version:     REV 04      CLEI Code:    PROTOXCLEI
ID: JNP10K-LC2101      FRU Model Number: PROTO-ASSEMBLY
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0c ff 01 04 52 45 56 20 30 34 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 38 34 37 37 39 00 00
Address 0x20: 53 2f 4e 20 43 41 4b 52 37 30 31 39 00 0b 03 07

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Address 0x30: e2 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff
CPU          REV 05    750-073391    CAKJ2854          LC 2101 PMB
Jedec Code:  0x7fb0          EEPROM Version:  0x01
P/N:         750-073391      S/N:       CAKJ2854
Assembly ID: 0x0cda          Assembly Version: 01.05
Date:        03-12-2018      Assembly Flags: 0x00
Version:     REV 05
ID: LC 2101 PMB
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 0c da 01 05 52 45 56 20 30 35 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 37 33 33 39 31 00 00
Address 0x20: 53 2f 4e 20 43 41 4b 4a 32 38 35 34 00 0c 03 07
Address 0x30: e2 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
PIC 0          BUILTIN    BUILTIN          4xQSFP28 SYNCE
Jedec Code:  0x0000          EEPROM Version:  0x00
P/N:         BUILTIN        S/N:       BUILTIN
Assembly ID: 0x0af3          Assembly Version: 00.00
Date:        00-00-0000      Assembly Flags: 0x00
ID: 4x QSFP28 10/40/100GE SYNCE PIC
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a f3 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 83 00 b1 f3 00 00 00 00 0a f3 00 00
Xcvr 0        REV 01    740-058734    1ACQ104300K      QSFP-100GBASE-SR4
PIC 1          BUILTIN    BUILTIN          4xQSFP28 SYNCE
Jedec Code:  0x0000          EEPROM Version:  0x00
P/N:         BUILTIN        S/N:       BUILTIN
Assembly ID: 0x0af3          Assembly Version: 00.00
Date:        00-00-0000      Assembly Flags: 0x00
ID: 4x QSFP28 10/40/100GE SYNCE PIC
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a f3 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Xcvr 0        REV 01    740-061405    1ACQ12110AN      QSFP-100GBASE-SR4
PIC 2          BUILTIN    BUILTIN          4xQSFP28 SYNCE

```

```

Jedec Code: 0x0000      EEPROM Version: 0x00
P/N:         BUILTIN    S/N:         BUILTIN
Assembly ID: 0x0af3     Assembly Version: 00.00
Date:        00-00-0000 Assembly Flags: 0x00
ID: 4x QSFP28 10/40/100GE SYNCE PIC
Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
  Address 0x00: 00 00 00 00 0a f3 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
  Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
  Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 83 80 b1 8a b5 cf 0b 5f 08 00 73 6d
  Xcvr 0      REV 01    740-046565    QG1105B2      QSFP+-40G-SR4
  PIC 3       BUILTIN   BUILTIN       4xQSFP28 SYNCE
Jedec Code: 0x0000      EEPROM Version: 0x00
P/N:         BUILTIN    S/N:         BUILTIN
Assembly ID: 0x0af3     Assembly Version: 00.00
Date:        00-00-0000 Assembly Flags: 0x00
ID: 4x QSFP28 10/40/100GE SYNCE PIC
Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
  Address 0x00: 00 00 00 00 0a f3 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
  Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
  Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 83 80 11 94 b5 cf 0b 5f 0c 00 73 6d
  Xcvr 0      REV 01    740-045627    QH08036X      40GBASE eSR4
  PIC 4       BUILTIN   BUILTIN       4xQSFP28 SYNCE
Jedec Code: 0x0000      EEPROM Version: 0x00
P/N:         BUILTIN    S/N:         BUILTIN
Assembly ID: 0x0af3     Assembly Version: 00.00
Date:        00-00-0000 Assembly Flags: 0x00
ID: 4x QSFP28 10/40/100GE SYNCE PIC
Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
  Address 0x00: 00 00 00 00 0a f3 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
  Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
  Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 83 80 71 9d b5 cf 0b 5f 10 00 73 6d
  Xcvr 0      REV 01    740-067443    XWRORY7      QSFP+-40G-SR4
  Xcvr 1      REV 01    740-067443    XWRORYH      QSFP+-40G-SR4
  Xcvr 2      REV 01    740-067443    XWRORYP      QSFP+-40G-SR4
  Xcvr 3      REV 01    740-067443    XWS028S      QSFP+-40G-SR4
  PIC 5       BUILTIN   BUILTIN       4xQSFP28 SYNCE
Jedec Code: 0x0000      EEPROM Version: 0x00
P/N:         BUILTIN    S/N:         BUILTIN
Assembly ID: 0x0af3     Assembly Version: 00.00

```

```

Date:          00-00-0000      Assembly Flags:    0x00
ID: 4x QSFP28 10/40/100GE SYNCE PIC
Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
  Address 0x00: 00 00 00 00 0a f3 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 25 73 3a 20
  Address 0x20: 42 55 49 4c 54 49 4e 00 25 73 3a 20 00 00 00 00
  Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 83 80 d1 a6 b5 cf 0b 5f 14 00 73 6d
Xcvr 3          REV 01    740-058734    1ACQ113406C    QSFP-100GBASE-SR4
FPD Board       REV 07    711-054687    ACPC7142        Front Panel Display
Jedec Code:     0x7fb0      EEPROM Version:    0x01
P/N:           711-054687    S/N:              ACPC7142
Assembly ID:    0x0bf2      Assembly Version:  01.07
Date:          07-22-2016    Assembly Flags:    0x00
Version:       REV 07
ID: Front Panel Display
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 01 ff 0b f2 01 07 52 45 56 20 30 37 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 35 34 36 38 37 00 00
  Address 0x20: 53 2f 4e 20 41 43 50 43 37 31 34 32 00 16 07 07
  Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
PEM 0           REV 02    740-049388    1EDL62102N9    Power Supply AC
Jedec Code:     0x7fb0      EEPROM Version:    0x02
P/N:           740-049388    S/N:              1EDL62102N9
Assembly ID:    0x0483      Assembly Version:  01.02
Date:          05-25-2016    Assembly Flags:    0x00
Version:       REV 02      CLEI Code:        CMUPADNBAA
ID: Power Supply AC      FRU Model Number: QFX10000-PWR-AC
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 83 01 02 52 45 56 20 30 32 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 39 33 38 38 00 00
  Address 0x20: 31 45 44 4c 36 32 31 30 32 4e 39 00 00 19 05 07
  Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 43 4d 55 50 41 44 4e 42 41 41 51
  Address 0x50: 46 58 31 30 30 30 30 2d 50 57 52 2d 41 43 00 00
  Address 0x60: 00 00 00 00 00 00 01 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff dc ff ff ff ff ff ff ff ff ff ff ff ff
PEM 1           REV 02    740-049388    1EDL60300KX    Power Supply AC
Jedec Code:     0x00b0      EEPROM Version:    0x02
P/N:           740-049388    S/N:              1EDL60300KX
Assembly ID:    0x0483      Assembly Version:  01.02
Date:          01-20-2016    Assembly Flags:    0x00
Version:       REV 02      CLEI Code:        CMUPADNBAA
ID: Power Supply AC      FRU Model Number: QFX10000-PWR-AC
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:

```



```

Address 0x00: 00 b0 02 ff 04 83 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 34 39 33 38 38 00 00
Address 0x20: 31 45 44 4c 36 30 33 30 30 4b 58 00 00 14 01 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 50 41 44 4e 42 41 41 51
Address 0x50: 46 58 31 30 30 30 30 2d 50 57 52 2d 41 43 00 00
Address 0x60: 00 00 00 00 00 00 01 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff dc ff ff ff ff ff ff ff ff ff ff ff ff
PEM 2          REV 02  740-049388  1EDL60300DL  Power Supply AC
Jedec Code:    0x7fb0          EEPROM Version: 0x02
P/N:           740-049388      S/N:           1EDL60300DL
Assembly ID:   0x0483          Assembly Version: 01.02
Date:          01-20-2016      Assembly Flags: 0x00
Version:       REV 02          CLEI Code:      CMUPADNBAA
ID: Power Supply AC          FRU Model Number: QFX10000-PWR-AC
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 83 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 34 39 33 38 38 00 00
Address 0x20: 31 45 44 4c 36 30 33 30 30 44 4c 00 00 14 01 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 50 41 44 4e 42 41 41 51
Address 0x50: 46 58 31 30 30 30 30 2d 50 57 52 2d 41 43 00 00
Address 0x60: 00 00 00 00 00 00 01 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff dc ff ff ff ff ff ff ff ff ff ff ff ff
PEM 3          REV 02  740-049388  1EDL61701BT  Power Supply AC
Jedec Code:    0x7fb0          EEPROM Version: 0x02
P/N:           740-049388      S/N:           1EDL61701BT
Assembly ID:   0x0483          Assembly Version: 01.02
Date:          05-01-2016      Assembly Flags: 0x00
Version:       REV 02          CLEI Code:      CMUPADNBAA
ID: Power Supply AC          FRU Model Number: QFX10000-PWR-AC
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 83 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 34 39 33 38 38 00 00
Address 0x20: 31 45 44 4c 36 31 37 30 31 42 54 00 00 01 05 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 50 41 44 4e 42 41 41 51
Address 0x50: 46 58 31 30 30 30 30 2d 50 57 52 2d 41 43 00 00
Address 0x60: 00 00 00 00 00 00 01 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff dc ff ff ff ff ff ff ff ff ff ff ff ff
PEM 4          REV 02  740-049388  1EDL62102P7  Power Supply AC
Jedec Code:    0x7fb0          EEPROM Version: 0x02
P/N:           740-049388      S/N:           1EDL62102P7
Assembly ID:   0x0483          Assembly Version: 01.02
Date:          05-25-2016      Assembly Flags: 0x00
Version:       REV 02          CLEI Code:      CMUPADNBAA
ID: Power Supply AC          FRU Model Number: QFX10000-PWR-AC
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 83 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 34 39 33 38 38 00 00
Address 0x20: 31 45 44 4c 36 32 31 30 32 50 37 00 00 19 05 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 50 41 44 4e 42 41 41 51
Address 0x50: 46 58 31 30 30 30 30 2d 50 57 52 2d 41 43 00 00

```

```

Address 0x60: 00 00 00 00 00 00 01 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff dc ff ff ff ff ff ff ff ff ff ff ff
PEM 5          REV 02    740-049388    1EDL62102PP    Power Supply AC
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           740-049388      S/N:             1EDL62102PP
Assembly ID:   0x0483          Assembly Version: 01.02
Date:          05-25-2016      Assembly Flags:   0x00
Version:       REV 02          CLEI Code:        CMUPADNBAA
ID: Power Supply AC          FRU Model Number: QFX10000-PWR-AC
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 83 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 34 39 33 38 38 00 00
Address 0x20: 31 45 44 4c 36 32 31 30 32 50 50 00 00 19 05 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 50 41 44 4e 42 41 41 51
Address 0x50: 46 58 31 30 30 30 30 2d 50 57 52 2d 41 43 00 00
Address 0x60: 00 00 00 00 00 00 01 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff dc ff ff ff ff ff ff ff ff ff ff ff
FTC 0          REV 14    750-050108    ACPE4038    Fan Controller 8
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-050108      S/N:             ACPE4038
Assembly ID:   0x0bee          Assembly Version: 01.14
Date:          09-27-2016      Assembly Flags:   0x00
Version:       REV 14          CLEI Code:        CMUCAHZCAA
ID: Fan Controller 8          FRU Model Number: QFX10008-FAN-CTRL
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b ee 01 0e 52 45 56 20 31 34 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 30 31 30 38 00 00
Address 0x20: 53 2f 4e 20 41 43 50 45 34 30 33 38 00 1b 09 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 5a 43 41 41 51
Address 0x50: 46 58 31 30 30 30 38 2d 46 41 4e 2d 43 54 52 4c
Address 0x60: 00 00 00 00 00 00 41 44 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 98 ff ff ff ff ff ff ff ff ff ff ff ff
FTC 1          REV 14    750-050108    ACPE4032    Fan Controller 8
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-050108      S/N:             ACPE4032
Assembly ID:   0x0bee          Assembly Version: 01.14
Date:          09-27-2016      Assembly Flags:   0x00
Version:       REV 14          CLEI Code:        CMUCAHZCAA
ID: Fan Controller 8          FRU Model Number: QFX10008-FAN-CTRL
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b ee 01 0e 52 45 56 20 31 34 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 30 31 30 38 00 00
Address 0x20: 53 2f 4e 20 41 43 50 45 34 30 33 32 00 1b 09 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 5a 43 41 41 51
Address 0x50: 46 58 31 30 30 30 38 2d 46 41 4e 2d 43 54 52 4c
Address 0x60: 00 00 00 00 00 00 41 44 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 98 ff ff ff ff ff ff ff ff ff ff ff ff
Fan Tray 0     REV 09    760-054372    ACPD6799    Fan Tray 8
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           760-054372      S/N:             ACPD6799
Assembly ID:   0x0bf0          Assembly Version: 01.09

```

```

Date:          09-28-2016      Assembly Flags:  0x00
Version:       REV 09         CLEI Code:       CMUCAHYCAA
ID: Fan Tray 8                FRU Model Number: QFX10008-FAN
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b f0 01 09 52 45 56 20 30 39 00 00
  Address 0x10: 00 00 00 00 37 36 30 2d 30 35 34 33 37 32 00 00
  Address 0x20: 53 2f 4e 20 41 43 50 44 36 37 39 39 00 1c 09 07
  Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 59 43 41 41 51
  Address 0x50: 46 58 31 30 30 30 38 2d 46 41 4e 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff f1 ff ff ff ff ff ff ff ff ff ff ff ff

Fan Tray 1          REV 09    760-054372    ACNZ3584          Fan Tray 8
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N:       760-054372    S/N:         ACNZ3584
Assembly ID: 0x0bf0     Assembly Version: 01.09
Date:      08-30-2016    Assembly Flags: 0x00
Version:   REV 09       CLEI Code:    CMUCAHYCAA
ID: Fan Tray 8          FRU Model Number: QFX10008-FAN
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b f0 01 09 52 45 56 20 30 39 00 00
  Address 0x10: 00 00 00 00 37 36 30 2d 30 35 34 33 37 32 00 00
  Address 0x20: 53 2f 4e 20 41 43 4e 5a 33 35 38 34 00 1e 08 07
  Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 59 43 41 41 51
  Address 0x50: 46 58 31 30 30 30 38 2d 46 41 4e 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff f1 ff ff ff ff ff ff ff ff ff ff ff ff

SFB 0              REV 24    750-050058    ACPD4587          Switch Fabric (SIB) 8
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N:       750-050058    S/N:         ACPD4587
Assembly ID: 0x0bec     Assembly Version: 01.24
Date:      06-19-2016    Assembly Flags: 0x00
Version:   REV 24       CLEI Code:    CMUCAHOCAA
ID: Switch Fabric (SIB) 8 FRU Model Number: QFX10008-SF
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b ec 01 18 52 45 56 20 32 34 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 35 30 30 35 38 00 00
  Address 0x20: 53 2f 4e 20 41 43 50 44 34 35 38 37 00 13 06 07
  Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 30 43 41 41 51
  Address 0x50: 46 58 31 30 30 30 38 2d 53 46 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 45 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff d1 00 00 00 00 00 00 00 00 00 00 00 00

SFB 1              REV 24    750-050058    ACNZ0635          Switch Fabric (SIB) 8
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N:       750-050058    S/N:         ACNZ0635
Assembly ID: 0x0bec     Assembly Version: 01.24
Date:      06-06-2016    Assembly Flags: 0x00
Version:   REV 24       CLEI Code:    CMUCAHOCAA
ID: Switch Fabric (SIB) 8 FRU Model Number: QFX10008-SF
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:

```

```

Address 0x00: 7f b0 02 ff 0b ec 01 18 52 45 56 20 32 34 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 30 30 35 38 00 00
Address 0x20: 53 2f 4e 20 41 43 4e 5a 30 36 33 35 00 06 06 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 30 43 41 41 51
Address 0x50: 46 58 31 30 30 30 38 2d 53 46 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 41 45 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff d1 00 00 00 00 00 00 00 00 00 00 00 00
SFB 2          REV 24    750-050058    ACPD4908          Switch Fabric (SIB) 8
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-050058      S/N:             ACPD4908
Assembly ID:   0x0bec          Assembly Version: 01.24
Date:          07-12-2016      Assembly Flags:   0x00
Version:       REV 24          CLEI Code:        CMUCAH0CAA
ID: Switch Fabric (SIB) 8      FRU Model Number: QFX10008-SF
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b ec 01 18 52 45 56 20 32 34 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 30 30 35 38 00 00
Address 0x20: 53 2f 4e 20 41 43 50 44 34 39 30 38 00 0c 07 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 30 43 41 41 51
Address 0x50: 46 58 31 30 30 30 38 2d 53 46 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 41 45 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff d1 00 00 00 00 00 00 00 00 00 00 00 00
SFB 3          REV 24    750-050058    ACNZ0617          Switch Fabric (SIB) 8
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-050058      S/N:             ACNZ0617
Assembly ID:   0x0bec          Assembly Version: 01.24
Date:          06-07-2016      Assembly Flags:   0x00
Version:       REV 24          CLEI Code:        CMUCAH0CAA
ID: Switch Fabric (SIB) 8      FRU Model Number: QFX10008-SF
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b ec 01 18 52 45 56 20 32 34 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 30 30 35 38 00 00
Address 0x20: 53 2f 4e 20 41 43 4e 5a 30 36 31 37 00 07 06 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 30 43 41 41 51
Address 0x50: 46 58 31 30 30 30 38 2d 53 46 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 41 45 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff d1 00 00 00 00 00 00 00 00 00 00 00 00
SFB 4          REV 24    750-050058    ACNZ0527          Switch Fabric (SIB) 8
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-050058      S/N:             ACNZ0527
Assembly ID:   0x0bec          Assembly Version: 01.24
Date:          06-06-2016      Assembly Flags:   0x00
Version:       REV 24          CLEI Code:        CMUCAH0CAA
ID: Switch Fabric (SIB) 8      FRU Model Number: QFX10008-SF
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b ec 01 18 52 45 56 20 32 34 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 30 30 35 38 00 00
Address 0x20: 53 2f 4e 20 41 43 4e 5a 30 35 32 37 00 06 06 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 30 43 41 41 51
Address 0x50: 46 58 31 30 30 30 38 2d 53 46 00 00 00 00 00 00

```

```

Address 0x60: 00 00 00 00 00 00 41 45 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff d1 00 00 00 00 00 00 00 00 00 00 00 00
SFB 5          REV 23    750-050058    ACNX6980          Switch Fabric (SIB) 8
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-050058      S/N:              ACNX6980
Assembly ID:   0x0bec          Assembly Version:  01.23
Date:          05-16-2016      Assembly Flags:    0x00
Version:       REV 23          CLEI Code:         CMUCAH0CAA
ID: Switch Fabric (SIB) 8      FRU Model Number:  QFX10008-SF
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b ec 01 17 52 45 56 20 32 33 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 30 30 35 38 00 00
Address 0x20: 53 2f 4e 20 41 43 4e 58 36 39 38 30 00 10 05 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4d 55 43 41 48 30 43 41 41 51
Address 0x50: 46 58 31 30 30 30 38 2d 53 46 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 41 42 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff ce 00 00 00 00 00 00 00 00 00 00 00 00

```

#### show chassis hardware models(MX10008 Router)

```
user@host> show chassis hardware models
```

Item	Version	Part number	Serial number	FRU model number
Midplane	REV 27	750-054097	ACPD4307	QFX10008-CHAS
CB 0	REV 02	750-079563	CAFF4580	
CB 1	REV 04	750-079563	CAGL8034	
FPC 0	REV 12	750-073174	CAJK0253	PROTO-ASSEMBLY
FPC 2	REV 03	750-073174	CAJB6004	PROTO-ASSEMBLY
FPC 3	REV 04	750-084779	CAKR7019	PROTO-ASSEMBLY
FPD Board	REV 07	711-054687	ACPC7142	
PEM 0	REV 02	740-049388	1EDL62102N9	QFX10000-PWR-AC
PEM 1	REV 02	740-049388	1EDL60300KX	QFX10000-PWR-AC
PEM 2	REV 02	740-049388	1EDL60300DL	QFX10000-PWR-AC
PEM 3	REV 02	740-049388	1EDL61701BT	QFX10000-PWR-AC
PEM 4	REV 02	740-049388	1EDL62102P7	QFX10000-PWR-AC
PEM 5	REV 02	740-049388	1EDL62102PP	QFX10000-PWR-AC
FTC 0	REV 14	750-050108	ACPE4038	QFX10008-FAN-CTRL
FTC 1	REV 14	750-050108	ACPE4032	QFX10008-FAN-CTRL
Fan Tray 0	REV 09	760-054372	ACPD6799	QFX10008-FAN
Fan Tray 1	REV 09	760-054372	ACNZ3584	QFX10008-FAN
SFB 0	REV 24	750-050058	ACPD4587	QFX10008-SF
SFB 1	REV 24	750-050058	ACNZ0635	QFX10008-SF
SFB 2	REV 24	750-050058	ACPD4908	QFX10008-SF
SFB 3	REV 24	750-050058	ACNZ0617	QFX10008-SF
SFB 4	REV 24	750-050058	ACNZ0527	QFX10008-SF
SFB 5	REV 23	750-050058	ACNX6980	QFX10008-SF

#### show chassis hardware (PTX3000 Router with 5-port 100-Gigabit DWDM OTN PIC)

```
user@host> show chassis hardware
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN123AC42AJC	PTX3000
Midplane	REV 22	750-044645	ACLP6640	Backplane
FPM	REV 07	760-044663	ACMX2146	Front Panel Display

PSM 1	REV 02	740-044980	1EDD3080169	DC 12V Power Supply
PSM 2	REV 06	740-044981	1EDK5040563	AC 12V Power Supply
PSM 3	REV 06	740-044981	1EDK5040313	AC 12V Power Supply
PSM 4	REV 04	740-044980	1EDJ3330088	DC 12V Power Supply
Routing Engine 0	REV 12	740-026942	P737A-006029	RE-DUO-2600
CB 0	REV 18	750-044656	ACMZ3179	Control Board
FPC 2	REV 06	750-057064	ACAM6098	FPC3-SFF-PTX-1X
CPU		BUILTIN	BUILTIN	SMPC PMB
PIC 0	REV 17	750-059747	ACNW3510	5X100GE DWDM CFP2-ACO
Xcvr 0	REV 01	740-062357	1DJBZ040003	OTN-100G-LH
Xcvr 2	REV 01	740-062357	1DJBZ044004	OTN-100G-LH
Xcvr 3	REV 01	740-062357	1DJBZ03500P	OTN-100G-LH
Xcvr 4	REV 01	740-062357	1DJBZ03700C	OTN-100G-LH
FPC 4	REV 12	750-057064	ACAM7153	FPC3-SFF-PTX-1X
CPU		BUILTIN	BUILTIN	SMPC PMB
PIC 0	REV 17	750-059747	ACNW3511	5X100GE DWDM CFP2-ACO
Xcvr 0	REV 01	740-061663	47	OTN-100G-LH
Xcvr 1	REV 01	740-061663	39	OTN-100G-LH
Xcvr 2	REV 01	740-062357	1DJBZ044002	OTN-100G-LH
Xcvr 3	REV 01	740-062357	1DJBZ03700G	OTN-100G-LH
Xcvr 4	REV 01	740-062357	1DJBZ041001	OTN-100G-LH
FPC 8	REV 11	750-057064	ACAM6808	FPC3-SFF-PTX-1X
CPU		BUILTIN	BUILTIN	SMPC PMB
PIC 0	REV 17	750-059747	ACNW3508	5X100GE DWDM CFP2-ACO
Xcvr 0	REV 01	740-061663	194	OTN-100G-LH
Xcvr 1	REV 01	740-061663	168	OTN-100G-LH
Xcvr 2	REV 01	740-061663	52	OTN-100G-LH
Xcvr 3	REV 01	740-061663	85	OTN-100G-LH
Xcvr 4	REV 01	740-061663	218	OTN-100G-LH
SIB 0	REV 03	750-057067	ACAM8513	SIB3-SFF-PTX
SIB 1	REV 01	750-057067	ACAM5918	SIB3-SFF-PTX
SIB 2	REV 01	711-057066	ACAM4325	SIB3-SFF-PTX
SIB 3	REV 01	711-057066	ACAM4328	SIB3-SFF-PTX
SIB 4	REV 01	711-057066	ACAM4349	SIB3-SFF-PTX
SIB 5	REV 01	711-057066	ACAM4323	SIB3-SFF-PTX
SIB 6	REV 01	711-057066	ACAM4344	SIB3-SFF-PTX
SIB 7	REV 01	750-057067	ACAM4346	SIB3-SFF-PTX
SIB 8	REV 01	750-057067	ACAM5911	SIB3-SFF-PTX
Fan Tray 0	REV 13	760-044659	ACMP6395	Fan Tray (Exhaust)
Fan Tray 1	REV 13	760-044659	ACMZ6957	Fan Tray (Exhaust)

### show chassis hardware clei-models (PTX3000 Router with 5-port 100-Gigabit DWDM OTN PIC)

```
user@host> show chassis hardware clei-models
```

#### Hardware inventory:

Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 22	750-044645	IPMVN10FRA	CHAS-MP-PTX3000-S
FPM	REV 07	760-044663	IPUCBE5CAA	FPD-SFF-PTX-S
PSM 1	REV 02	740-044980	PROTOPWRDC	PSM-SFF-PTX-DC-2200-S
PSM 2	REV 06	740-044981	IPUPAK0KAB	PSM-SFF-PTX-AC-S
PSM 3	REV 06	740-044981	IPUPAK0KAB	PSM-SFF-PTX-AC-S
PSM 4	REV 04	740-044980	IPUPAK1KAA	PSM-SFF-PTX-DC-S
Routing Engine 0	REV 12	740-026942		RE-DUO-C2600-16G-S
CB 0	REV 18	750-044656	IPUCBE6CAB	CB-SFF-PTX-S
FPC 2	REV 06	750-057064	PROTOXCLEI	PROTO-ASSEMBLY
PIC 0	REV 17	750-059747	IPU3BC5HAA	PTX-5-100G-WDM
FPC 4	REV 12	750-057064		
PIC 0	REV 17	750-059747	IPU3BC5HAA	PTX-5-100G-WDM
FPC 8	REV 11	750-057064		

PIC 0	REV 17	750-059747	IPU3BC5HAA	PTX-5-100G-WDM
SIB 0	REV 03	750-057067	PROTOXCLEI	PROTO-ASSEMBLY
SIB 1	REV 01	750-057067	PROTOXCLEI	PROTO-ASSEMBLY
SIB 2	REV 01	711-057066	PROTOXCLEI	PROTO-ASSEMBLY
SIB 3	REV 01	711-057066	PROTOXCLEI	PROTO-ASSEMBLY
SIB 4	REV 01	711-057066	PROTOXCLEI	PROTO-ASSEMBLY
SIB 5	REV 01	711-057066	PROTOXCLEI	PROTO-ASSEMBLY
SIB 6	REV 01	711-057066	PROTOXCLEI	PROTO-ASSEMBLY
SIB 7	REV 01	750-057067	PROTOXCLEI	PROTO-ASSEMBLY
SIB 8	REV 01	750-057067	PROTOXCLEI	PROTO-ASSEMBLY
Fan Tray 0	REV 13	760-044659	IPUCBE8CAA	FAN-SFF-PTX-S
Fan Tray 1	REV 13	760-044659	IPUCBE8CAA	FAN-SFF-PTX-S

### show chassis hardware (MX2010 Router)

```
user@host > show chassis hardware
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN11E3217AFK	MX2010
Midplane				Lower Backplane
Midplane 1	REV 01	750-044636	ABAB8506	Upper Backplane
PMP	REV 03	711-032426	ACA11388	Power Midplane
FPM Board	REV 06	711-032349	ZX8744	Front Panel Display
PSM 4	REV 0C	740-033727	VK00254	DC 52V Power Supply
Module				
PSM 5	REV 0B	740-033727	VG00015	DC 52V Power Supply
Module				
PSM 6	REV 0B	740-033727	VH00097	DC 52V Power Supply
Module				
PSM 7	REV 0C	740-033727	VJ00151	DC 52V Power Supply
Module				
PSM 8	REV 0C	740-033727	VJ00149	DC 52V Power Supply
Module				
PDM 0	REV 0B	740-038109	WA00008	DC Power Dist Module
PDM 1	REV 0B	740-038109	WA00014	DC Power Dist Module
Routing Engine 0	REV 02	740-041821	9009094134	RE-S-1800x4
Routing Engine 1	REV 02	740-041821	9009094141	RE-S-1800x4
CB 0	REV 08	750-040257	CAAB3491	Control Board
CB 1	REV 08	750-040257	CAAB3489	Control Board
SPMB 0	REV 02	711-041855	CAA6135	PMB Board
SPMB 1	REV 02	711-041855	CAA6137	PMB Board
SFB 0	REV 06	711-032385	ZV1828	Switch Fabric Board
SFB 1	REV 07	711-032385	ZZ2568	Switch Fabric Board
SFB 2	REV 07	711-032385	ZZ2563	Switch Fabric Board
SFB 3	REV 07	711-032385	ZZ2564	Switch Fabric Board
SFB 4	REV 07	711-032385	ZZ2580	Switch Fabric Board
SFB 5	REV 07	711-032385	ZZ2579	Switch Fabric Board
SFB 6	REV 07	711-032385	CAAB4882	Switch Fabric Board
SFB 7	REV 07	711-032385	CAAB4898	Switch Fabric Board
FPC 0	REV 33	750-028467	CAAB1919	MPC 3D 16x 10GE
CPU	REV 11	711-029089	CAAB7174	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	AMH02RE	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AMH038C	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AMH0390	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AMG0SUA	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	AMH0579	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AMG0SGP	SFP+-10G-SR

Xcvr 2	REV 01	740-021308	AMH04SV	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AMH04X3	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	AMH0135	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AMH02NC	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AMH02XB	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AMH02PN	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	AMH057Y	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AMG0JHE	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AMH02HT	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AMH04V4	SFP+-10G-SR
FPC 1	REV 21	750-033205	ZG5027	MPC Type 3
CPU	REV 04	711-035209	YT4780	HMPC PMB 2G
MIC 0	REV 03	750-033307	ZV6299	10X10GE SFPP
PIC 0		BUILTIN	BUILTIN	10X10GE SFPP
Xcvr 0	REV 01	740-031980	083363A00410	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	083363A00334	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	113363A00125	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	083363A00953	SFP+-10G-SR
Xcvr 4	REV 01	740-031980	AHR013D	SFP+-10G-SR
Xcvr 5	REV 01	740-031980	AJ40JUR	SFP+-10G-SR
Xcvr 6	REV 01	740-031980	AJ40JKL	SFP+-10G-SR
Xcvr 7	REV 01	740-031980	AJ30ECK	SFP+-10G-SR
Xcvr 8	REV 01	740-021308	19T511100864	SFP+-10G-SR
Xcvr 9	REV 01	740-021308	19T511100868	SFP+-10G-SR
MIC 1	REV 03	750-033307	ZV6268	10X10GE SFPP
PIC 2		BUILTIN	BUILTIN	10X10GE SFPP
Xcvr 0	REV 01	740-031980	AJCOJML	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AJ403PC	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AJ10N25	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AJ40JF4	SFP+-10G-SR
Xcvr 4	REV 01	740-031980	AJ40JSJ	SFP+-10G-SR
Xcvr 5	REV 01	740-031980	AJ403V7	SFP+-10G-SR
Xcvr 6	REV 01	740-031980	AJ40JN3	SFP+-10G-SR
Xcvr 7	REV 01	740-031980	AJ40JSU	SFP+-10G-SR
Xcvr 8	REV 01	740-021308	19T511100468	SFP+-10G-SR
Xcvr 9	REV 01	740-021308	19T511101363	SFP+-10G-SR
FPC 8	REV 22	750-031089	ZT9746	MPC Type 2 3D
CPU	REV 06	711-030884	ZS1271	MPC PMB 2G
MIC 0	REV 26	750-028392	ABBS1150	3D 20x 1GE(LAN) SFP
PIC 0		BUILTIN	BUILTIN	10x 1GE(LAN) SFP
Xcvr 0	REV 01	740-031851	PLG023C	SFP-SX
Xcvr 1	REV 01	740-031851	PLG09C6	SFP-SX
Xcvr 2	REV 02	740-011613	AM0950SF9L7	SFP-SX
Xcvr 3	REV 02	740-011613	AM1001SFN1H	SFP-SX
Xcvr 4	REV 02	740-011613	AM1001SFM9D	SFP-SX
Xcvr 5	REV 02	740-011613	AM1001SFLTJ	SFP-SX
Xcvr 6	REV 01	740-031851	AC1108S03L9	SFP-SX
Xcvr 7	REV 01	740-031851	AC1102S00NC	SFP-SX
Xcvr 8	REV 01	740-031851	AC1102S00MX	SFP-SX
Xcvr 9	REV 01	740-031851	AC1102S0085	SFP-SX
PIC 1		BUILTIN	BUILTIN	10x 1GE(LAN) SFP
Xcvr 0	REV 01	740-031851	AC1102S00KU	SFP-SX
Xcvr 1	REV 01	740-031851	AC1102S00NG	SFP-SX
Xcvr 2	REV 01	740-031851	AC1102S00K3	SFP-SX
Xcvr 3	REV 01	740-031851	AC1102S008R	SFP-SX
Xcvr 4	REV 01	740-031851	AM1107SUFVJ	SFP-SX
Xcvr 5	REV 01	740-031851	AC1108S03LG	SFP-SX
MIC 1	REV 26	750-028387	ABBR9582	3D 4x 10GE XFP



PIC 2		BUILTIN	BUILTIN	2x 10GE XFP
Xcvr 0		NON-JNPR	T10A91703	XFP-10G-SR
Xcvr 1		NON-JNPR	T09L42604	XFP-10G-SR
PIC 3		BUILTIN	BUILTIN	2x 10GE XFP
FPC 9	REV 11	750-036284	ZL3591	MPC 3D 16x 10GE EM
CPU	REV 10	711-029089	ZL0513	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	1YT517101825	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	1YT517101821	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	1YT517101682	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	ALQ13R6	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	1YT517101828	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	1YT517101716	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	1YT517101732	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	ALPOTR1	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	1YT517101741	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	1YT517101829	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	1YT517101669	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	ALQ14E3	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	1YT517101826	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	1YT517101817	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	1YT517101735	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	ALQ159A	SFP+-10G-SR
ADC 0	REV 05	750-043596	CAAC2073	Adapter Card
ADC 1	REV 01	750-043596	ZV4117	Adapter Card
ADC 8	REV 01	750-043596	ZV4107	Adapter Card
ADC 9	REV 02	750-043596	ZW1555	Adapter Card
Fan Tray 0	REV 2A	760-046960	ACAY0015	172mm FanTray - 6 Fans
Fan Tray 1	REV 2A	760-046960	ACAY0019	172mm FanTray - 6 Fans
Fan Tray 2	REV 2A	760-046960	ACAY0020	172mm FanTray - 6 Fans
Fan Tray 3	REV 2A	760-046960	ACAY0021	172mm FanTray - 6 Fans

### show chassis hardware detail (MX2010 Router)

```
user@host > show chassis hardware detail
```

Hardware inventory:				
Item	Version	Part number	Serial number	Description
Chassis			JN11E233DAFK	MX2010
Midplane	REV 26	750-044636	ABAB9357	Lower Backplane
Midplane 1	REV 01	711-044557	ABAB8643	Upper Backplane
PMP	REV 04	711-032426	ACAJ1677	Power Midplane
FPM Board	REV 08	760-044634	ABBV9726	Front Panel Display
PSM 0	REV 01	740-045050	1E02224000P	DC 52V Power Supply
Module				
PSM 1	REV 01	740-045050	1E02224000M	DC 52V Power Supply
Module				
PSM 2	REV 01	740-045050	1E022240010	DC 52V Power Supply
Module				
PSM 3	REV 01	740-045050	1E02224000G	DC 52V Power Supply
Module				
PSM 4	REV 01	740-045050	1E022240013	DC 52V Power Supply
Module				
PSM 5	REV 01	740-045050	1E022240007	DC 52V Power Supply
Module				
PSM 6	REV 01	740-045050	1E02224001C	DC 52V Power Supply
Module				

PSM 7 Module	REV 01	740-045050	1E02224001D	DC 52V Power Supply
PSM 8 Module	REV 01	740-045050	1E02224001B	DC 52V Power Supply
PDM 0	REV 01	740-045234	1E262250067	DC Power Dist Module
Routing Engine 0	REV 02	740-041821	9009099704	RE-S-1800x4
ad0 3831 MB		UGB30SFA4000T1	SFA4000T1 00000651	Compact Flash
ad1 30533 MB		UGB94BPH32H0S1-KCI	11000019592	Disk 1
usb0 (addr 1)		EHCI root hub 0	Intel	uhub0
usb0 (addr 2)		product 0x0020 32	vendor 0x8087	uhub1
DIMM 0		SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54	MFR ID-ce80	
DIMM 1		SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54	MFR ID-ce80	
DIMM 2		SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54	MFR ID-ce80	
DIMM 3		SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54	MFR ID-ce80	
Routing Engine 1	REV 02	740-041821	9009099706	RE-S-1800x4
ad0 3998 MB		Virtium - TuffDrive	VCF P1T0200262860208 114	Compact Flash
ad1 30533 MB		UGB94ARF32H0S3-KC	UNIGEN-499551-000404	Disk 1
CB 0	REV 13	750-040257	CAAF8436	Control Board
CB 1	REV 13	750-040257	CAAF8434	Control Board
SPMB 0	REV 02	711-041855	ABBV3825	PMB Board
SPMB 1	REV 02	711-041855	ABBV3833	PMB Board
SFB 0	REV 05	711-044466	ABBX5682	Switch Fabric Board
SFB 1	REV 05	711-044466	ABBX5676	Switch Fabric Board
SFB 2	REV 05	711-044466	ABBX5665	Switch Fabric Board
SFB 3	REV 05	711-044466	ABBX5699	Switch Fabric Board
SFB 4	REV 05	711-044466	ABBX5603	Switch Fabric Board
SFB 5	REV 05	711-044466	ABBX5587	Switch Fabric Board
SFB 6	REV 05	711-044466	ABBX5607	Switch Fabric Board
SFB 7	REV 05	711-044466	ABBX5669	Switch Fabric Board
FPC 0	REV 09	750-037355	CAAF0924	MPC Type 4-2
CPU	REV 08	711-035209	CAAB9842	HMPC PMB 2G
PIC 0		BUILTIN	BUILTIN	4x10GE SFPP
Xcvr 0	REV 01	740-021308	19T511101656	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AMA04RU	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	193363A00558	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B10M00202	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	1X100GE CFP
Xcvr 0		NON-JNPR	X12J00328	CFP-100G-SR10
PIC 2		BUILTIN	BUILTIN	4x10GE SFPP
Xcvr 0	REV 01	740-031980	AMA088W	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B10L04211	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	19T511101602	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B10L04151	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	1X100GE CFP
Xcvr 0		NON-JNPR	X12J00332	CFP-100G-SR10
FPC 1	REV 18	750-033205	ZE0128	MPC Type 3
CPU	REV 06	711-035209	ZG5431	HMPC PMB 2G
MIC 0	REV 15	750-033199	ZP6435	1X100GE CFP
PIC 0		BUILTIN	BUILTIN	1X100GE CFP
Xcvr 0	REV 01	740-032210	J11E46118	CFP-100G-LR4
MIC 1	REV 15	750-033199	ZP6442	1X100GE CFP
PIC 2		BUILTIN	BUILTIN	1X100GE CFP
Xcvr 0	REV 01	740-032210	UMN03T4	CFP-100G-LR4
FPC 2	REV 16	750-037358	CAAL1001	MPC Type 4-1
CPU	REV 08	711-035209	CAAK7927	HMPC PMB 2G
PIC 0		BUILTIN	BUILTIN	8X10GE SFPP
Xcvr 0	REV 01	740-031980	193363A00589	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	973152A00028	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	193363A00376	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	973152A00016	SFP+-10G-SR

Xcvr 4	REV 01	740-031980	193363A00499	SFP+-10G-SR
Xcvr 5	REV 01	740-021308	973152A00039	SFP+-10G-SR
Xcvr 6	REV 01	740-031980	B11E01239	SFP+-10G-SR
Xcvr 7	REV 01	740-021308	973152A00058	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	8X10GE SFP
Xcvr 0	REV 01	740-031980	B10M00075	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	973152A00014	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AMA0638	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	973152A00063	SFP+-10G-SR
Xcvr 4	REV 01	740-031980	AMA0629	SFP+-10G-SR
Xcvr 5	REV 01	740-021308	973152A00053	SFP+-10G-SR
Xcvr 6	REV 01	740-031980	193363A00344	SFP+-10G-SR
Xcvr 7	REV 01	740-021308	973152A00046	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	8X10GE SFP
Xcvr 0	REV 01	740-031980	AMA062M	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	973152A00080	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	193363A00580	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	973152A00064	SFP+-10G-SR
Xcvr 4	REV 01	740-031980	093363A01494	SFP+-10G-SR
Xcvr 5	REV 01	740-021308	973152A00020	SFP+-10G-SR
Xcvr 6	REV 01	740-031980	123363A00047	SFP+-10G-SR
Xcvr 7	REV 01	740-021308	973152A00072	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	8X10GE SFP
Xcvr 0	REV 01	740-021308	03DZ06A01033	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	973152A00022	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	03DZ06A01026	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	973152A00013	SFP+-10G-SR
Xcvr 4	REV 01	740-021308	03DZ06A01028	SFP+-10G-SR
Xcvr 5	REV 01	740-021308	973152A00079	SFP+-10G-SR
Xcvr 6	REV 01	740-021308	03DZ06A01018	SFP+-10G-SR
Xcvr 7	REV 01	740-021308	973152A00025	SFP+-10G-SR
FPC 3	REV 33	750-028467	CAAF5400	MPC 3D 16x 10GE
CPU	REV 11	711-029089	CAAH7626	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	973152A00066	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	973152A00021	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	973152A00062	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	973152A00027	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	973152A00065	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	973152A00069	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	973152A00026	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	973152A00003	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	973152A00035	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	973152A00004	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	973152A00049	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	973152A00055	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	973152A00010	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	973152A00001	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	973152A00073	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	973152A00012	SFP+-10G-SR
FPC 4	REV 21	750-033205	ZG5028	MPC Type 3
CPU	REV 05	711-035209	YX3911	HMPC PMB 2G
MIC 0	REV 03	750-036233	ZL2036	2X40GE QSFP
PIC 0		BUILTIN	BUILTIN	2X40GE QSFP
Xcvr 0	REV 01	740-032986	QB220708	QSFP+-40G-SR4
Xcvr 1	REV 01	740-032986	QB220735	QSFP+-40G-SR4
MIC 1	REV 03	750-036233	ZL2028	2X40GE QSFP

PIC 2			BUILTIN	BUILTIN	2X40GE QSFP
Xcvr 0	REV 01	740-032986	QB220727	QSFP+-40G-SR4	
Xcvr 1	REV 01	740-032986	QB220715	QSFP+-40G-SR4	
FPC 5	REV 11	750-037358	CAAE2196	MPC Type 4-1	
CPU	REV 08	711-035209	CAAD9074	HMPC PMB 2G	
PIC 0		BUILTIN	BUILTIN	8X10GE SFPP	
Xcvr 0	REV 01	740-031980	AMA062S	SFP+-10G-SR	
Xcvr 1	REV 01	740-031980	AMA062P	SFP+-10G-SR	
Xcvr 2	REV 01	740-031980	AMA052R	SFP+-10G-SR	
Xcvr 3	REV 01	740-031980	AMA0632	SFP+-10G-SR	
Xcvr 4	REV 01	740-031980	193363A00564	SFP+-10G-SR	
Xcvr 5	REV 01	740-031980	193363A00229	SFP+-10G-SR	
Xcvr 6	REV 01	740-031980	193363A00363	SFP+-10G-SR	
Xcvr 7	REV 01	740-031980	193363A00278	SFP+-10G-SR	
PIC 1		BUILTIN	BUILTIN	8X10GE SFPP	
Xcvr 0	REV 01	740-031980	AMA04CC	SFP+-10G-SR	
Xcvr 1	REV 01	740-021308	AD0927A001W	SFP+-10G-SR	
Xcvr 2	REV 01	740-031980	AMA04N2	SFP+-10G-SR	
Xcvr 3	REV 01	740-031980	AMA062U	SFP+-10G-SR	
Xcvr 4	REV 01	740-031980	193363A00491	SFP+-10G-SR	
Xcvr 5	REV 01	740-031980	183363A01511	SFP+-10G-SR	
Xcvr 6	REV 01	740-031980	193363A00565	SFP+-10G-SR	
Xcvr 7	REV 01	740-031980	193363A00405	SFP+-10G-SR	
PIC 2		BUILTIN	BUILTIN	8X10GE SFPP	
Xcvr 0	REV 01	740-031980	AMA07QX	SFP+-10G-SR	
Xcvr 1	REV 01	740-031980	AMA06MS	SFP+-10G-SR	
Xcvr 2	REV 01	740-031980	193363A00318	SFP+-10G-SR	
Xcvr 3	REV 01	740-031980	193363A00402	SFP+-10G-SR	
Xcvr 4	REV 01	740-031980	193363A00174	SFP+-10G-SR	
Xcvr 5	REV 01	740-031980	193363A00388	SFP+-10G-SR	
Xcvr 6	REV 01	740-031980	193363A00377	SFP+-10G-SR	
Xcvr 7	REV 01	740-031980	193363A00234	SFP+-10G-SR	
PIC 3		BUILTIN	BUILTIN	8X10GE SFPP	
Xcvr 0	REV 01	740-031980	AMA062T	SFP+-10G-SR	
Xcvr 1	REV 01	740-031980	193363A00550	SFP+-10G-SR	
Xcvr 2	REV 01	740-031980	193363A00364	SFP+-10G-SR	
Xcvr 3	REV 01	740-031980	AMA0630	SFP+-10G-SR	
Xcvr 4	REV 01	740-031980	193363A00509	SFP+-10G-SR	
Xcvr 5	REV 01	740-031980	193363A00459	SFP+-10G-SR	
Xcvr 6	REV 01	740-031980	113363A00191	SFP+-10G-SR	
Xcvr 7	REV 01	740-031980	193363A00352	SFP+-10G-SR	
FPC 6	REV 33	750-028467	CAAF5552	MPC 3D 16x 10GE	
CPU	REV 11	711-029089	CAAH7601	AMPC PMB	
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+	
Xcvr 0	REV 01	740-021308	AD0927A0036	SFP+-10G-SR	
Xcvr 1	REV 01	740-021308	AD0927A003M	SFP+-10G-SR	
Xcvr 2	REV 01	740-021308	AD0927A003G	SFP+-10G-SR	
Xcvr 3	REV 01	740-021308	AD0927A0031	SFP+-10G-SR	
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+	
Xcvr 0	REV 01	740-031980	193363A00331	SFP+-10G-SR	
Xcvr 1	REV 01	740-031980	193363A00325	SFP+-10G-SR	
Xcvr 2	REV 01	740-031980	193363A00417	SFP+-10G-SR	
Xcvr 3	REV 01	740-031980	183363A02509	SFP+-10G-SR	
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+	
Xcvr 0	REV 01	740-021308	T09K75140	SFP+-10G-SR	
Xcvr 1	REV 01	740-031980	B11A04356	SFP+-10G-SR	
Xcvr 2	REV 01	740-031980	B11K01952	SFP+-10G-SR	
Xcvr 3	REV 01	740-031980	B11K01914	SFP+-10G-SR	
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+	
Xcvr 0	REV 01	740-021308	T09K75157	SFP+-10G-SR	

Xcvr 1	REV 01	740-021308	T09K75194	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B11K01926	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B11K01936	SFP+-10G-SR
FPC 7	REV 16	750-037358	CAAL1012	MPC Type 4-1
CPU	REV 08	711-035209	CAAJ3851	HMPC PMB 2G
PIC 0		BUILTIN	BUILTIN	8X10GE SFPP
Xcvr 0	REV 01	740-031980	AMA04NK	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11F00260	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B11E02192	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AMA04CP	SFP+-10G-SR
Xcvr 4	REV 01	740-031980	AJ40JJK	SFP+-10G-SR
Xcvr 5	REV 01	740-031980	B11F00238	SFP+-10G-SR
Xcvr 6	REV 01	740-031980	B10M00275	SFP+-10G-SR
Xcvr 7	REV 01	740-031980	193363A00211	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	8X10GE SFPP
Xcvr 0	REV 01	740-031980	B11D05577	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11G00586	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AMA08B7	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AMA04Q0	SFP+-10G-SR
Xcvr 4	REV 01	740-031980	B11D05840	SFP+-10G-SR
Xcvr 5	REV 01	740-031980	B11E00467	SFP+-10G-SR
Xcvr 6	REV 01	740-031980	B11E00029	SFP+-10G-SR
Xcvr 7	REV 01	740-021308	19T511101712	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	8X10GE SFPP
Xcvr 0	REV 01	740-031980	193363A00568	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B10M00166	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B10M00212	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B11D05823	SFP+-10G-SR
Xcvr 4	REV 01	740-021308	03DZ06A01005	SFP+-10G-SR
Xcvr 5	REV 01	740-021308	03DZ06A01003	SFP+-10G-SR
Xcvr 6	REV 01	740-021308	03DZ06A01009	SFP+-10G-SR
Xcvr 7	REV 01	740-021308	03DZ06A01004	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	8X10GE SFPP
Xcvr 0	REV 01	740-021308	03DZ06A01017	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	03DZ06A01016	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	03DZ06A01024	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	03DZ06A01008	SFP+-10G-SR
Xcvr 4	REV 01	740-030658	AD0946A02UH	SFP+-10G-USR
Xcvr 5	REV 01	740-021308	T09J67913	SFP+-10G-SR
Xcvr 6	REV 01	740-021308	AD0837ES09G	SFP+-10G-SR
Xcvr 7	REV 01	740-021308	03DZ06A01015	SFP+-10G-SR
FPC 8	REV 03	750-045372	CAAD3111	MPC Type 3
CPU	REV 08	711-035209	CAAD8033	HMPC PMB 2G
MIC 0	REV 03	750-036233	ZL2032	2X40GE QSFP
PIC 0		BUILTIN	BUILTIN	2X40GE QSFP
Xcvr 0	REV 01	740-032986	QB230273	QSFP+-40G-SR4
Xcvr 1	REV 01	740-032986	QB230254	QSFP+-40G-SR4
MIC 1	REV 03	750-036233	ZL2021	2X40GE QSFP
PIC 2		BUILTIN	BUILTIN	2X40GE QSFP
Xcvr 0	REV 01	740-032986	QB390962	QSFP+-40G-SR4
Xcvr 1	REV 01	740-032986	QB390960	QSFP+-40G-SR4
FPC 9	REV 09	750-037355	CAAF1531	MPC Type 4-2
CPU	REV 08	711-035209	CAAB9927	HMPC PMB 2G
PIC 0		BUILTIN	BUILTIN	4x10GE SFPP
Xcvr 0	REV 01	740-031980	193363A00525	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	193363A00504	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	193363A00368	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AJ40JSS	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	1X100GE CFP
PIC 2		BUILTIN	BUILTIN	4x10GE SFPP

Xcvr 0	REV 01	740-031980	123363A00042	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B10M00023	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AJ802EM	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B11E02348	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	1X100GE CFP
ADC 0	REV 13	750-043596	ABBX5532	Adapter Card
ADC 1	REV 13	750-043596	ABBX5550	Adapter Card
ADC 2	REV 13	750-043596	ABBX5571	Adapter Card
ADC 3	REV 13	750-043596	ABBX5568	Adapter Card
ADC 4	REV 13	750-043596	ABBX5556	Adapter Card
ADC 5	REV 13	750-043596	ABBX5553	Adapter Card
ADC 6	REV 13	750-043596	ABBX5541	Adapter Card
ADC 7	REV 13	750-043596	ABBX5578	Adapter Card
ADC 8	REV 13	750-043596	ABBX5560	Adapter Card
ADC 9	REV 07	750-043596	ABBV7188	Adapter Card
Fan Tray 0	REV 03	760-046960	ACAY0127	172mm FanTray - 6 Fans
Fan Tray 1	REV 2A	760-046960	ACAY0068	172mm FanTray - 6 Fans
Fan Tray 2	REV 2A	760-046960	ACAY0072	172mm FanTray - 6 Fans
Fan Tray 3	REV 2A	760-046960	ACAY0070	172mm FanTray - 6 Fans

### show chassis hardware extensive (MX2010 Router)

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user@host > show chassis hardware extensive
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#### Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN11E233DAFK	MX2010
Jedec Code:	0x7fb0	EEPROM Version:	0x02	
		S/N:	JN11E233DAFK	
Assembly ID:	0x0557	Assembly Version:	00.00	
Date:	00-00-0000	Assembly Flags:	0x00	
ID:	MX2010			
Board Information Record:				
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00				
I2C Hex Data:				
Address 0x00: 7f b0 02 ff 05 57 00 00 00 00 00 00 00 00 00 00				
Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00				
Address 0x20: 4a 4e 31 31 45 32 33 33 44 41 46 4b 00 00 00 00				
Address 0x30: 00 00 00 ff 00 00 00 00 00 00 00 00 00 00 00 00				
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00				
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00				
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00				
Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00				
Midplane	REV 26	750-044636	ABAB9357	Lower Backplane
Jedec Code:	0x7fb0	EEPROM Version:	0x02	
P/N:	750-044636	S/N:	ABAB9357	
Assembly ID:	0x0b66	Assembly Version:	01.26	
Date:	08-28-2012	Assembly Flags:	0x00	
Version:	REV 26	CLEI Code:	PROTOXCLEI	
ID:	Lower Backplane	FRU Model Number:	PROTO-ASSEMBLY	
Board Information Record:				
Address 0x00: ad 01 08 00 2c 21 72 70 a0 00 ff ff ff ff ff ff				
I2C Hex Data:				
Address 0x00: 7f b0 02 ff 0b 66 01 1a 52 45 56 20 32 36 00 00				
Address 0x10: 00 00 00 00 37 35 30 2d 30 34 34 36 33 36 00 00				
Address 0x20: 53 2f 4e 20 41 42 41 42 39 33 35 37 00 1c 08 07				
Address 0x30: dc ff ff ff ad 01 08 00 2c 21 72 70 a0 00 ff ff				
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50				
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00				
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff				

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Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff
Midplane 1      REV 01    711-044557    ABAB8643    Upper Backplane
Jedec Code:    0x7fb0      EEPROM Version:    0x01
P/N:          711-044557    S/N:              ABAB8643
Assembly ID:  0x0b65      Assembly Version:  01.01
Date:         07-27-2012    Assembly Flags:    0x00
Version:      REV 01
ID: Upper Backplane
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 0b 65 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 34 34 35 35 37 00 00
Address 0x20: 53 2f 4e 20 41 42 41 42 38 36 34 33 00 1b 07 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
PMP            REV 04    711-032426    ACAJ1677    Power Midplane
Jedec Code:    0x7fb0      EEPROM Version:    0x01
P/N:          711-032426    S/N:              ACAJ1677
Assembly ID:  0x045d      Assembly Version:  01.04
Date:         07-20-2012    Assembly Flags:    0x00
Version:      REV 04
ID: Power Midplane
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 04 5d 01 04 52 45 56 20 30 34 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 33 32 34 32 36 00 00
Address 0x20: 53 2f 4e 20 41 43 41 4a 31 36 37 37 00 14 07 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM Board      REV 08    760-044634    ABBV9726    Front Panel Display
Jedec Code:    0x7fb0      EEPROM Version:    0x02
P/N:          760-044634    S/N:              ABBV9726
Assembly ID:  0x0b64      Assembly Version:  01.08
Date:         09-10-2012    Assembly Flags:    0x00
Version:      REV 08      CLEI Code:        IPMYA4EJRA
ID: Front Panel Display    FRU Model Number:  MX2010-CRAFT-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 64 01 08 52 45 56 20 30 38 00 00
Address 0x10: 00 00 00 00 37 36 30 2d 30 34 34 36 33 34 00 00
Address 0x20: 53 2f 4e 20 41 42 42 56 39 37 32 36 00 0a 09 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 4d 59 41 34 45 4a 52 41 4d
Address 0x50: 58 32 30 31 30 2d 43 52 41 46 54 2d 53 00 00 00
Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 93 ff ff ff ff ff ff ff ff ff ff ff ff
PSM 0          REV 01    740-045050    1E02224000P    DC 52V Power Supply
Module
Jedec Code:    0x7fb0      EEPROM Version:    0x02
P/N:          740-045050    S/N:              1E02224000P
Assembly ID:  0x0478      Assembly Version:  01.01

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Date:          12-06-2012      Assembly Flags:  0x00
Version:       REV 01          CLEI Code:         XXXXXXXXXX
ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-HC-DC-S-A
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 30 35 30 00 00
  Address 0x20: 31 45 30 32 32 32 34 30 30 30 50 00 00 06 0c 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 58 58 58 58 58 58 58 58 58 58 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 48 43 2d 44 43 2d
  Address 0x60: 53 2d 41 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 4a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 1          REV 01    740-045050    1E02224000M    DC 52V Power Supply
Module
Jedec Code:    0x7fb0          EEPROM Version:  0x02
P/N:           740-045050      S/N:             1E02224000M
Assembly ID:   0x0478          Assembly Version: 01.01
Date:          12-06-2012      Assembly Flags:  0x00
Version:       REV 01          CLEI Code:         XXXXXXXXXX
ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-HC-DC-S-A
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 30 35 30 00 00
  Address 0x20: 31 45 30 32 32 32 34 30 30 30 4d 00 00 06 0c 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 58 58 58 58 58 58 58 58 58 58 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 48 43 2d 44 43 2d
  Address 0x60: 53 2d 41 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 4a 00 00 00 00 00 00 00 00 00 00 00 00
...
PDM 0          REV 01    740-045234    1E262250067    DC Power Dist Module
Jedec Code:    0x7fb0          EEPROM Version:  0x02
P/N:           740-045234      S/N:             1E262250067
Assembly ID:   0x047b          Assembly Version: 01.01
Date:          06-28-2012      Assembly Flags:  0x00
Version:       REV 01          CLEI Code:         IPUPAJSKAA
ID: DC Power Dist Module      FRU Model Number:  MX2000-PDM-DC-S-A
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 7b 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 32 33 34 00 00
  Address 0x20: 31 45 32 36 32 32 35 30 30 36 37 00 00 1c 06 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4a 53 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 44 4d 2d 44 43 2d 53 2d 41
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 89 00 00 00 00 00 00 00 00 00 00 00 00
Routing Engine 0 REV 02    740-041821    9009099704    RE-S-1800x4
Jedec Code:    0x7fb0          EEPROM Version:  0x02
P/N:           740-041821      S/N:             9009099704
Assembly ID:   0x09c0          Assembly Version: 01.02
Date:          03-15-2012      Assembly Flags:  0x00
Version:       REV 02
ID: RE-S-1800x4                FRU Model Number:  RE-S-1800X4-16G-S
Board Information Record:

```



```

Address 0x00: 54 32 30 32 37 44 41 2d 34 34 47 42 23 41 23 00
I2C Hex Data:
Address 0x00: 7f b0 02 ff 09 c0 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 34 31 38 32 31 00 00
Address 0x20: 39 30 30 39 30 39 39 37 30 34 00 00 00 0f 03 07
Address 0x30: dc ff ff ff 54 32 30 32 37 44 41 2d 34 34 47 42
Address 0x40: 23 41 23 00 01 00 00 00 00 00 00 00 00 00 52
Address 0x50: 45 2d 53 2d 31 38 30 30 58 34 2d 31 36 47 2d 53
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 8c ff ff ff ff ff ff ff ff ff ff ff ff
ad0 3831 MB UGB30SFA4000T1 SFA4000T1 00000651 Compact Flash
ad1 30533 MB UGB94BPH32H0S1-KCI 11000019592 Disk 1
usb0 (addr 1) EHCI root hub 0 Intel uhub0
usb0 (addr 2) product 0x0020 32 vendor 0x8087 uhub1
DIMM 0 SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
DIMM 1 SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
DIMM 2 SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
DIMM 3 SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
Routing Engine 1 REV 02 740-041821 9009099706 RE-S-1800x4
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 740-041821 S/N: 9009099706
Assembly ID: 0x09c0 Assembly Version: 01.02
Date: 02-23-2012 Assembly Flags: 0x00
Version: REV 02
ID: RE-S-1800x4 FRU Model Number: RE-S-1800X4-16G-S
Board Information Record:
Address 0x00: 54 32 30 32 37 44 41 2d 34 34 47 42 23 41 23 00
I2C Hex Data:
Address 0x00: 7f b0 02 ff 09 c0 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 34 31 38 32 31 00 00
Address 0x20: 39 30 30 39 30 39 39 37 30 36 00 00 00 17 02 07
Address 0x30: dc ff ff ff 54 32 30 32 37 44 41 2d 34 34 47 42
Address 0x40: 23 41 23 00 01 00 00 00 00 00 00 00 00 00 52
Address 0x50: 45 2d 53 2d 31 38 30 30 58 34 2d 31 36 47 2d 53
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 8c ff ff ff ff ff ff ff ff ff ff ff ff
ad0 3998 MB Virtium - TuffDrive VCF P1T0200262860208 114 Compact Flash
ad1 30533 MB UGB94ARF32H0S3-KC UNIGEN-499551-000404 Disk 1
CB 0 REV 13 750-040257 CAAF8436 Control Board
Jedec Code: 0x7fb0 EEPROM Version: 0x02
P/N: 750-040257 S/N: CAAF8436
Assembly ID: 0x0b26 Assembly Version: 01.13
Date: 08-29-2012 Assembly Flags: 0x00
Version: REV 13 CLEI Code: PROTOXCLEI
ID: Control Board FRU Model Number: PROTO-ASSEMBLY
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 26 01 0d 52 45 56 20 31 33 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 34 30 32 35 37 00 00
Address 0x20: 53 2f 4e 20 43 41 41 46 38 34 33 36 00 1d 08 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff
...
SPMB 0 REV 02 711-041855 ABBV3825 PMB Board
Jedec Code: 0x7fb0 EEPROM Version: 0x01
P/N: 711-041855 S/N: ABBV3825

```

```

Assembly ID: 0x0b29      Assembly Version: 01.02
Date: 08-14-2012      Assembly Flags: 0x00
Version: REV 02
ID: PMB Board
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 0b 29 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 34 31 38 35 35 00 00
Address 0x20: 53 2f 4e 20 41 42 42 56 33 38 32 35 00 0e 08 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff
Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
...
SFB 0      REV 05      711-044466      ABBX5682      Switch Fabric Board
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N: 711-044466      S/N: ABBX5682
Assembly ID: 0x0b25      Assembly Version: 01.05
Date: 09-07-2012      Assembly Flags: 0x00
Version: REV 05      CLEI Code: PROTOXCLEI
ID: Switch Fabric Board      FRU Model Number: PROTO-ASSEMBLY
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 25 01 05 52 45 56 20 30 35 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 34 34 34 36 36 00 00
Address 0x20: 53 2f 4e 20 41 42 42 58 35 36 38 32 00 07 09 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff
Address 0x70: ff ff ff c2 00 00 00 01 00 00 00 00 00 00 48 00
...
FPC 0      REV 09      750-037355      CAAF0924      MPC Type 4-2
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N: 750-037355      S/N: CAAF0924
Assembly ID: 0x0b4e      Assembly Version: 01.09
Date: 05-21-2012      Assembly Flags: 0x00
Version: REV 09      CLEI Code: PROTOXCLEI
ID: MPC Type 4-2      FRU Model Number: MPC4E-2CGE-8XGE
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 4e 01 09 52 45 56 20 30 39 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 33 37 33 35 35 00 00
Address 0x20: 53 2f 4e 20 43 41 41 46 30 39 32 34 00 15 05 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 4d
Address 0x50: 50 43 34 45 2d 32 43 47 45 2d 38 58 47 45 00 00
Address 0x60: 00 00 00 00 00 00 30 39 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c6 ff ff ff ff ff ff ff ff ff ff ff ff
CPU      REV 08      711-035209      CAAB9842      HMPC PMB 2G
Jedec Code: 0x7fb0      EEPROM Version: 0x01
P/N: 711-035209      S/N: CAAB9842
Assembly ID: 0x0b04      Assembly Version: 01.08
Date: 05-17-2012      Assembly Flags: 0x00
Version: REV 08
ID: HMPC PMB 2G

```

```

Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 0b 04 01 08 52 45 56 20 30 38 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 33 35 32 30 39 00 00
Address 0x20: 53 2f 4e 20 43 41 41 42 39 38 34 32 00 11 05 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff
Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
PIC 0          BUILTIN          BUILTIN          4x10GE SFPP
Jedec Code:    0x0000          EEPROM Version: 0x00
P/N:          BUILTIN          S/N:          BUILTIN
Assembly ID:   0x0a53          Assembly Version: 00.00
Date:          00-00-0000      Assembly Flags: 0x00
ID: 4x10GE SFPP
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a 53 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 4d 58 43 00
Address 0x20: 42 55 49 4c 54 49 4e 00 4d 58 43 00 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 c0 02 ae 64 00 00 00 00 0a 52 00 00
Xcvr 0      REV 01    740-021308    19T511101656    SFP+-10G-SR
Xcvr 1      REV 01    740-031980    AMA04RU         SFP+-10G-SR
Xcvr 2      REV 01    740-031980    193363A00558    SFP+-10G-SR
Xcvr 3      REV 01    740-031980    B10M00202       SFP+-10G-SR
...
ADC 0      REV 13    750-043596    ABBX5532        Adapter Card
Jedec Code: 0x7fb0          EEPROM Version: 0x02
P/N:        750-043596      S/N:          ABBX5532
Assembly ID: 0x0b3d          Assembly Version: 01.13
Date:       09-12-2012      Assembly Flags: 0x00
Version:    REV 13          CLEI Code:    IPUCBA8CAA
ID: Adapter Card            FRU Model Number: MX2000-LC-ADAPTER
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 3d 01 0d 52 45 56 20 31 33 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 34 33 35 39 36 00 00
Address 0x20: 53 2f 4e 20 41 42 42 58 35 35 33 32 00 0c 09 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 43 42 41 38 43 41 41 4d
Address 0x50: 58 32 30 30 30 2d 4c 43 2d 41 44 41 50 54 45 52
Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 3a 00 00 00 00 00 00 00 00 00 00 00 00
...

```

### show chassis hardware models (MX2010 Router)

```
user@host > show chassis hardware models
```

```
Hardware inventory:
```

Item	Version	Part number	Serial number	FRU model number
FPM Board	REV 06	711-032349	ZX8744	711-032349

PSM 4	REV 0C	740-033727	VK00254	000000000000000000000000
PSM 5	REV 0B	740-033727	VG00015	000000000000000000000000
PSM 6	REV 0B	740-033727	VH00097	000000000000000000000000
PSM 7	REV 0C	740-033727	VJ00151	000000000000000000000000
PSM 8	REV 0C	740-033727	VJ00149	000000000000000000000000
PDM 0	REV 0B	740-038109	WA00008	
PDM 1	REV 0B	740-038109	WA00014	
Routing Engine 0	REV 02	740-041821	9009094134	RE-S-1800X4-16G-S
Routing Engine 1	REV 02	740-041821	9009094141	RE-S-1800X4-16G-S
CB 0	REV 08	750-040257	CAAB3491	750-040257
CB 1	REV 08	750-040257	CAAB3489	750-040257
SFB 0	REV 06	711-032385	ZV1828	711-032385
SFB 1	REV 07	711-032385	ZZ2568	711-032385
SFB 2	REV 07	711-032385	ZZ2563	711-032385
SFB 3	REV 07	711-032385	ZZ2564	711-032385
SFB 4	REV 07	711-032385	ZZ2580	711-032385
SFB 5	REV 07	711-032385	ZZ2579	711-0323856
SFB 6	REV 07	711-032385	CAAB4882	711-044170
SFB 7	REV 07	711-032385	CAAB4898	711-044170
FPC 0	REV 33	750-028467	CAAB1919	MPC-3D-16XGE-SFPP
FPC 1	REV 21	750-033205	ZG5027	MX-MPC3-3D
MIC 0	REV 03	750-033307	ZV6299	MIC3-3D-10XGE-SFPP
MIC 1	REV 03	750-033307	ZV6268	MIC3-3D-10XGE-SFPP
FPC 8	REV 22	750-031089	ZT9746	MX-MPC2-3D
MIC 0	REV 26	750-028392	ABBS1150	MIC-3D-20GE-SFP
MIC 1	REV 26	750-028387	ABBR9582	MIC-3D-4XGE-XFP
FPC 9	REV 11	750-036284	ZL3591	MPCE-3D-16XGE-SFPP
ADC 0	REV 05	750-043596	CAAC2073	750-043596
ADC 1	REV 01	750-043596	ZV4117	750-043596
ADC 8	REV 01	750-043596	ZV4107	750-043596
ADC 9	REV 02	750-043596	ZW1555	750-043596
Fan Tray 0	REV 2A	760-046960	ACAY0015	
Fan Tray 1	REV 2A	760-046960	ACAY0019	
Fan Tray 2	REV 2A	760-046960	ACAY0020	
Fan Tray 3	REV 2A	760-046960	ACAY0021	

## show chassis hardware clei-models (MX2010 Routers)

user@host &gt; show chassis hardware clei-models

Hardware inventory:

Item	Version	Part number	CLEI code	FRU model number
FPM Board	REV 06	711-032349	PROTOXCLEI	711-032349
PSM 4	REV 0C	740-033727	0000000000	000000000000000000000000
PSM 5	REV 0B	740-033727	0000000000	000000000000000000000000
PSM 6	REV 0B	740-033727	0000000000	000000000000000000000000
PSM 7	REV 0C	740-033727	0000000000	000000000000000000000000
PSM 8	REV 0C	740-033727	0000000000	000000000000000000000000
PDM 0	REV 0B	740-038109		
PDM 1	REV 0B	740-038109		
Routing Engine 0	REV 02	740-041821		RE-S-1800X4-16G-S
Routing Engine 1	REV 02	740-041821		RE-S-1800X4-16G-S
CB 0	REV 08	750-040257	PROTOXCLEI	750-040257
CB 1	REV 08	750-040257	PROTOXCLEI	750-040257
SFB 0	REV 06	711-032385	PROTOXCLEI	711-032385
SFB 1	REV 07	711-032385	PROTOXCLEI	711-032385
SFB 2	REV 07	711-032385	PROTOXCLEI	711-032385
SFB 3	REV 07	711-032385	PROTOXCLEI	711-032385
SFB 4	REV 07	711-032385	PROTOXCLEI	711-032385
SFB 5	REV 07	711-032385	PROTOXCLEI	711-0323856

SFB 6	REV 07	711-032385	PROTOXCLEI	711-044170
SFB 7	REV 07	711-032385	PROTOXCLEI	711-044170
FPC 0	REV 33	750-028467		MPC-3D-16XGE-SFPP
FPC 1	REV 21	750-033205		MX-MPC3-3D
MIC 0	REV 03	750-033307	PROTOXCLEI	MIC3-3D-10XGE-SFPP
MIC 1	REV 03	750-033307	PROTOXCLEI	MIC3-3D-10XGE-SFPP
FPC 8	REV 22	750-031089	COUIBAYBAA	MX-MPC2-3D
MIC 0	REV 26	750-028392	COUIA15BAA	MIC-3D-20GE-SFP
MIC 1	REV 26	750-028387	COUIA16BAA	MIC-3D-4XGE-XFP
FPC 9	REV 11	750-036284	CMUIACGBAA	MPCE-3D-16XGE-SFPP
ADC 0	REV 05	750-043596	PROTOXCLEI	750-043596
ADC 1	REV 01	750-043596	PROTOXCLEI	750-043596
ADC 8	REV 01	750-043596	PROTOXCLEI	750-043596
ADC 9	REV 02	750-043596	PROTOXCLEI	750-043596
Fan Tray 0	REV 2A	760-046960		
Fan Tray 1	REV 2A	760-046960		
Fan Tray 2	REV 2A	760-046960		
Fan Tray 3	REV 2A	760-046960		

### show chassis hardware (MX2010 Routers with MPC6E and OTN MIC)

user@host> show chassis hardware

Hardware inventory:				
Item	Version	Part number	Serial number	Description
Chassis			JN11C9AFEAFK	MX2010
Midplane	REV 35	750-044636	ABAB9188	Lower Backplane
Midplane 1	REV 02	711-044557	ABAB8729	Upper Backplane
PMP	REV 04	711-032426	ACAJ2432	Power Midplane
FPM Board	REV 09	760-044634	ABCA4314	Front Panel Display
PSM 0	REV 01	740-050037	1EDB321015C	DC 52V Power Supply
Module				
PSM 1	REV 01	740-050037	1EDB321015J	DC 52V Power Supply
Module				
PSM 2	REV 01	740-050037	1EDB32000K8	DC 52V Power Supply
Module				
PSM 3	REV 01	740-050037	1EDB32101JW	DC 52V Power Supply
Module				
PSM 4	REV 01	740-050037	1EDB321015G	DC 52V Power Supply
Module				
PSM 5	REV 01	740-050037	1EDB32101HH	DC 52V Power Supply
Module				
PSM 6	REV 01	740-050037	1EDB32101HD	DC 52V Power Supply
Module				
PSM 7	REV 01	740-050037	1EDB321015F	DC 52V Power Supply
Module				
PSM 8	REV 01	740-050037	1EDB321015B	DC 52V Power Supply
Module				
PDM 0	REV 03	740-045234	1EFA3220433	DC Power Dist Module
PDM 1	REV 03	740-045234	1EFA3220425	DC Power Dist Module
Routing Engine 0	REV 02	740-041821	9009115685	RE-S-1800x4
Routing Engine 1	REV 02	740-041821	9009099711	RE-S-1800x4
CB 0	REV 23	750-040257	CABE8395	Control Board
CB 1	REV 12	750-040257	CAAD9499	Control Board
SPMB 0	REV 02	711-041855	ABCG8426	PMB Board
SPMB 1	REV 02	711-041855	ABBS1481	PMB Board
SFB 0	REV 06	711-044466	ABCD5013	Switch Fabric Board
SFB 1	REV 06	711-044466	ABCD5160	Switch Fabric Board
SFB 2	REV 06	711-044466	ABCD5175	Switch Fabric Board
SFB 3	REV 06	711-044466	ABCD4938	Switch Fabric Board

SFB 4	REV 06	711-044466	ABCD4944	Switch Fabric Board
SFB 5	REV 06	711-044466	ABCD4968	Switch Fabric Board
SFB 6	REV 06	711-044466	ABCD5267	Switch Fabric Board
SFB 7	REV 06	711-044466	ABCD4997	Switch Fabric Board
FPC 0	REV 59	750-044130	ABCT7676	MPC6E 3D
CPU	REV 10	711-045719	ABCK8527	RMPC PMB
XLM 0	REV 13	711-046638	ABCT7810	MPC6E XL
XLM 1	REV 13	711-046638	ABCT7811	MPC6E XL
FPC 2	REV 27	750-033205	ZL6014	MPCE Type 3 3D
CPU	REV 07	711-035209	ZK9068	HMPC PMB 2G
MIC 0	REV 14	750-033196	CAAW9214	1X100GE CXP
PIC 0		BUILTIN	BUILTIN	1X100GE CXP
Xcvr 0	REV 01	740-046563	XC49FC030	CFP2-100G-SR10
MIC 1	REV 18	750-033199	CAAC3231	1X100GE CFP
PIC 2		BUILTIN	BUILTIN	1X100GE CFP
FPC 3	REV 59	750-044130	ABCT7682	MPC6E 3D
CPU	REV 10	711-045719	ABCK8531	RMPC PMB
XLM 0	REV 13	711-046638	ABCT7818	MPC6E XL
XLM 1	REV 13	711-046638	ABCT7819	MPC6E XL
FPC 4	REV 33	750-044130	ABBY9278	MPC6E 3D
CPU	REV 09	711-045719	ABBY8677	RMPC PMB
XLM 0	REV 06.2.00	711-046638	ABBY8844	MPC6E XL
XLM 1	REV 06.2.00	711-046638	ABBY8830	MPC6E XL
FPC 5	REV 59	750-044130	ABCT7675	MPC6E 3D
CPU	REV 10	711-045719	ABCK8526	RMPC PMB
XLM 0	REV 13	711-046638	ABCT7808	MPC6E XL
XLM 1	REV 13	711-046638	ABCT7809	MPC6E XL
FPC 6	REV 30	750-028467	ZM4986	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ZP6541	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	AQ43GAC	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	ALMOA6D	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AQFORB3	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	153363A00333	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AN10KYE	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	APK04YM	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AQFOH44	SFP+-10G-SR
FPC 8	REV 38	750-031090	CABF7313	MPC Type 2 3D EQ
CPU	REV 08	711-030884	CABE6727	MPC PMB 2G
MIC 0	REV 18	750-028380	YK8253	3D 2x 10GE XFP
PIC 0		BUILTIN	BUILTIN	1x 10GE XFP
Xcvr 0	REV 03	740-014289	AD1148M00TP	XFP-10G-SR
PIC 1		BUILTIN	BUILTIN	1x 10GE XFP
QXM 0	REV 06	711-028408	CABC5614	MPC QXM
QXM 1	REV 06	711-028408	CABC5550	MPC QXM
FPC 9	REV 39	750-044130	ABCK1652	MPC6E 3D
CPU	REV 09	711-045719	ABCK1655	RMPC PMB
MIC 0	REV 09	750-049457	ABCP1230	2X100GE CFP2 OTN
PIC 0		BUILTIN	BUILTIN	2X100GE CFP2 OTN
Xcvr 0		NON-JNPR	37300222WP0002	CFP2-100G-LR4-D
Xcvr 1		NON-JNPR	FD46F001Y	CFP2-100G-SR10
MIC 1	REV 07	750-049457	ABCV6662	2X100GE CFP2 OTN
PIC 1		BUILTIN	BUILTIN	2X100GE CFP2 OTN
Xcvr 0		NON-JNPR	UQD0014	CFP2-100G-LR4-D
Xcvr 1		NON-JNPR	J13J68335	CFP2-100G-LR4-D
XLM 0	REV 07.2.00	711-046638	ABCK5491	MPC6E XL
XLM 1	REV 07.2.00	711-046638	ABCK5475	MPC6E XL

ADC 1	REV 17	750-043596	ABCG9023	Adapter Card
ADC 2	REV 01	750-043596	ZV4079	Adapter Card
ADC 6	REV 17	750-043596	ABCG8866	Adapter Card
ADC 8	REV 17	750-043596	ABCA8993	Adapter Card
Fan Tray 0	REV 06	760-046960	ACAY0354	172mm FanTray - 6 Fans
Fan Tray 1	REV 06	760-046960	ACAY0831	172mm FanTray - 6 Fans
Fan Tray 2	REV 06	760-046960	ACAY0892	172mm FanTray - 6 Fans
Fan Tray 3	REV 06	760-046960	ACAY0839	172mm FanTray - 6 Fans

### show chassis hardware detail (MX2010 Routers with MPC6E and OTN MIC)

```
user@host> show chassis hardware detail
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN11C9AFEAFK	MX2010
Midplane	REV 35	750-044636	ABAB9188	Lower Backplane
Midplane 1	REV 02	711-044557	ABAB8729	Upper Backplane
PMP	REV 04	711-032426	ACAJ2432	Power Midplane
FPM Board	REV 09	760-044634	ABCA4314	Front Panel Display
PSM 0	REV 01	740-050037	1EDB321015C	DC 52V Power Supply
Module				
PSM 1	REV 01	740-050037	1EDB321015J	DC 52V Power Supply
Module				
PSM 2	REV 01	740-050037	1EDB32000K8	DC 52V Power Supply
Module				
PSM 3	REV 01	740-050037	1EDB32101JW	DC 52V Power Supply
Module				
PSM 4	REV 01	740-050037	1EDB321015G	DC 52V Power Supply
Module				
PSM 5	REV 01	740-050037	1EDB32101HH	DC 52V Power Supply
Module				
PSM 6	REV 01	740-050037	1EDB32101HD	DC 52V Power Supply
Module				
PSM 7	REV 01	740-050037	1EDB321015F	DC 52V Power Supply
Module				
PSM 8	REV 01	740-050037	1EDB321015B	DC 52V Power Supply
Module				
PDM 0	REV 03	740-045234	1EFA3220433	DC Power Dist Module
PDM 1	REV 03	740-045234	1EFA3220425	DC Power Dist Module
Routing Engine 0	REV 02	740-041821	9009115685	RE-S-1800x4
ad0 3998 MB	Virtium - TuffDrive	VCF P1T0200274310822	191	Compact Flash
ad1 30533 MB	UGB94BPH32H0S1-KCI	11000043190		Disk 1
usb0 (addr 1)	EHCI root hub 0	Intel		uhub0
usb0 (addr 2)	product 0x0020 32	vendor 0x8087		uhub1
DIMM 0	VL31B5263F-F8SD DIE	REV-0 PCB REV-0		MFR ID-ce80
DIMM 1	VL31B5263F-F8SD DIE	REV-0 PCB REV-0		MFR ID-ce80
DIMM 2	VL31B5263F-F8SD DIE	REV-0 PCB REV-0		MFR ID-ce80
DIMM 3	VL31B5263F-F8SD DIE	REV-0 PCB REV-0		MFR ID-ce80
Routing Engine 1	REV 02	740-041821	9009099711	RE-S-1800x4
ad0 3998 MB	Virtium - TuffDrive	VCF P1T0200262860208	30	Compact Flash
ad1 30533 MB	UGB94ARF32H0S3-KC	UNIGEN-499551-000146		Disk 1
CB 0	REV 23	750-040257	CABE8395	Control Board
CB 1	REV 12	750-040257	CAAD9499	Control Board
SPMB 0	REV 02	711-041855	ABCG8426	PMB Board
SPMB 1	REV 02	711-041855	ABBS1481	PMB Board
SFB 0	REV 06	711-044466	ABCD5013	Switch Fabric Board
SFB 1	REV 06	711-044466	ABCD5160	Switch Fabric Board
SFB 2	REV 06	711-044466	ABCD5175	Switch Fabric Board
SFB 3	REV 06	711-044466	ABCD4938	Switch Fabric Board

SFB 4	REV 06	711-044466	ABCD4944	Switch Fabric Board
SFB 5	REV 06	711-044466	ABCD4968	Switch Fabric Board
SFB 6	REV 06	711-044466	ABCD5267	Switch Fabric Board
SFB 7	REV 06	711-044466	ABCD4997	Switch Fabric Board
FPC 0	REV 59	750-044130	ABCT7676	MPC6E 3D
CPU	REV 10	711-045719	ABCK8527	RMPK PMB
XLM 0	REV 13	711-046638	ABCT7810	MPC6E XL
XLM 1	REV 13	711-046638	ABCT7811	MPC6E XL
FPC 2	REV 27	750-033205	ZL6014	MPCE Type 3 3D
CPU	REV 07	711-035209	ZK9068	HMPK PMB 2G
MIC 0	REV 14	750-033196	CAAW9214	1X100GE CXP
PIC 0		BUILTIN	BUILTIN	1X100GE CXP
Xcvr 0	REV 01	740-046563	XC49FC030	CFP2-100G-SR10
MIC 1	REV 18	750-033199	CAAC3231	1X100GE CFP
PIC 2		BUILTIN	BUILTIN	1X100GE CFP
FPC 3	REV 59	750-044130	ABCT7682	MPC6E 3D
CPU	REV 10	711-045719	ABCK8531	RMPK PMB
XLM 0	REV 13	711-046638	ABCT7818	MPC6E XL
XLM 1	REV 13	711-046638	ABCT7819	MPC6E XL
FPC 4	REV 33	750-044130	ABBY9278	MPC6E 3D
CPU	REV 09	711-045719	ABBY8677	RMPK PMB
XLM 0	REV 06.2.00	711-046638	ABBY8844	MPC6E XL
XLM 1	REV 06.2.00	711-046638	ABBY8830	MPC6E XL
FPC 5	REV 59	750-044130	ABCT7675	MPC6E 3D
CPU	REV 10	711-045719	ABCK8526	RMPK PMB
XLM 0	REV 13	711-046638	ABCT7808	MPC6E XL
XLM 1	REV 13	711-046638	ABCT7809	MPC6E XL
FPC 6	REV 30	750-028467	ZM4986	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ZP6541	AMPK PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	AQ43GAC	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	ALMOA6D	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AQFORB3	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	153363A00333	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AN10KYE	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	APK04YM	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AQFOH44	SFP+-10G-SR
FPC 8	REV 38	750-031090	CABF7313	MPC Type 2 3D EQ
CPU	REV 08	711-030884	CABE6727	MPC PMB 2G
MIC 0	REV 18	750-028380	YK8253	3D 2x 10GE XFP
PIC 0		BUILTIN	BUILTIN	1x 10GE XFP
Xcvr 0	REV 03	740-014289	AD1148M00TP	XFP-10G-SR
PIC 1		BUILTIN	BUILTIN	1x 10GE XFP
QXM 0	REV 06	711-028408	CABC5614	MPC QXM
QXM 1	REV 06	711-028408	CABC5550	MPC QXM
FPC 9	REV 39	750-044130	ABCK1652	MPC6E 3D
CPU	REV 09	711-045719	ABCK1655	RMPK PMB
MIC 0	REV 09	750-049457	ABCP1230	2X100GE CFP2 OTN
PIC 0		BUILTIN	BUILTIN	2X100GE CFP2 OTN
Xcvr 0		NON-JNPR	37300222WP0002	CFP2-100G-LR4-D
Xcvr 1		NON-JNPR	FD46F001Y	CFP2-100G-SR10
MIC 1	REV 07	750-049457	ABCV6662	2X100GE CFP2 OTN
PIC 1		BUILTIN	BUILTIN	2X100GE CFP2 OTN
Xcvr 0		NON-JNPR	UQD0014	CFP2-100G-LR4-D
Xcvr 1		NON-JNPR	J13J68335	CFP2-100G-LR4-D
XLM 0	REV 07.2.00	711-046638	ABCK5491	MPC6E XL
XLM 1	REV 07.2.00	711-046638	ABCK5475	MPC6E XL



ADC 1	REV 17	750-043596	ABCG9023	Adapter Card
ADC 2	REV 01	750-043596	ZV4079	Adapter Card
ADC 6	REV 17	750-043596	ABCG8866	Adapter Card
ADC 8	REV 17	750-043596	ABCA8993	Adapter Card
Fan Tray 0	REV 06	760-046960	ACAY0354	172mm FanTray - 6 Fans
Fan Tray 1	REV 06	760-046960	ACAY0831	172mm FanTray - 6 Fans
Fan Tray 2	REV 06	760-046960	ACAY0892	172mm FanTray - 6 Fans
Fan Tray 3	REV 06	760-046960	ACAY0839	172mm FanTray - 6 Fans

### show chassis hardware extensive (MX2010 Routers with MPC6E and OTN MIC)

```
user@host> show chassis hardware extensive
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN11C9AFEAFK	MX2010
Jedec Code:	0x7fb0		EEPROM Version:	0x02
			S/N:	JN11C9AFEAFK
Assembly ID:	0x0557		Assembly Version:	00.00
Date:	00-00-0000		Assembly Flags:	0x00

ID: MX2010

Board Information Record:

Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

I2C Hex Data:

Address 0x00: 7f b0 02 ff 05 57 00 00 00 00 00 00 00 00 00 00

Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Address 0x20: 4a 4e 31 31 43 39 41 46 45 41 46 4b 00 00 00 00

Address 0x30: 00 00 00 ff 00 00 00 00 00 00 00 00 00 00 00 00

Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Midplane	REV 35	750-044636	ABAB9188	Lower Backplane
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Jedec Code:	0x7fb0	EEPROM Version:	0x02
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P/N:	750-044636	S/N:	ABAB9188
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Assembly ID:	0x0b66	Assembly Version:	01.35
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Date:	06-21-2013	Assembly Flags:	0x00
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Version:	REV 35	CLEI Code:	IPMU810ARA
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ID: Lower Backplane	FRU Model Number:	CHAS-BP-MX2010-S
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Board Information Record:

Address 0x00: ad 01 08 00 3c 8a b0 38 68 00 ff ff ff ff ff ff

I2C Hex Data:

Address 0x00: 7f b0 02 ff 0b 66 01 23 52 45 56 20 33 35 00 00

Address 0x10: 00 00 00 00 37 35 30 2d 30 34 34 36 33 36 00 00

Address 0x20: 53 2f 4e 20 41 42 41 42 39 31 38 38 00 15 06 07

Address 0x30: dd ff ff ff ad 01 08 00 3c 8a b0 38 68 00 ff ff

Address 0x40: ff ff ff ff 01 49 50 4d 55 38 31 30 41 52 41 43

Address 0x50: 48 41 53 2d 42 50 2d 4d 58 32 30 31 30 2d 53 00

Address 0x60: 00 00 00 00 00 00 30 36 00 ff ff ff ff ff ff ff

Address 0x70: ff ff ff f8 ff ff ff ff ff ff ff ff ff ff ff ff

Midplane 1	REV 02	711-044557	ABAB8729	Upper Backplane
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Jedec Code:	0x7fb0	EEPROM Version:	0x01
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P/N:	711-044557	S/N:	ABAB8729
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Assembly ID:	0x0b65	Assembly Version:	01.02
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Date:	03-21-2013	Assembly Flags:	0x00
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Version:	REV 02
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ID: Upper Backplane

Board Information Record:

Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff

I2C Hex Data:

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Address 0x00: 7f b0 01 ff 0b 65 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 34 34 35 35 37 00 00
Address 0x20: 53 2f 4e 20 41 42 41 42 38 37 32 39 00 15 03 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
PMP                REV 04    711-032426    ACAJ2432                Power Midplane
Jedec Code:    0x7fb0                EEPROM Version:    0x01
P/N:          711-032426                S/N:              ACAJ2432
Assembly ID:  0x045d                Assembly Version:  01.04
Date:         03-28-2013                Assembly Flags:    0x00
Version:      REV 04
ID: Power Midplane
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 04 5d 01 04 52 45 56 20 30 34 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 33 32 34 32 36 00 00
Address 0x20: 53 2f 4e 20 41 43 41 4a 32 34 33 32 00 1c 03 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM Board          REV 09    760-044634    ABCA4314                Front Panel Display
Jedec Code:    0x7fb0                EEPROM Version:    0x02
P/N:          760-044634                S/N:              ABCA4314
Assembly ID:  0x0b64                Assembly Version:  01.09
Date:         03-28-2013                Assembly Flags:    0x00
Version:      REV 09                CLEI Code:        IPMYA4EJRA
ID: Front Panel Display                FRU Model Number: MX2010-CRAFT-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 64 01 09 52 45 56 20 30 39 00 00
Address 0x10: 00 00 00 00 37 36 30 2d 30 34 34 36 33 34 00 00
Address 0x20: 53 2f 4e 20 41 42 43 41 34 33 31 34 00 1c 03 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 4d 59 41 34 45 4a 52 41 4d
Address 0x50: 58 32 30 31 30 2d 43 52 41 46 54 2d 53 00 00 00
Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 93 ff ff ff ff ff ff ff ff ff ff ff ff
PSM 0              REV 01    740-050037    1EDB321015C            DC 52V Power Supply
Module
Jedec Code:    0x7fb0                EEPROM Version:    0x02
P/N:          740-050037                S/N:              1EDB321015C
Assembly ID:  0x0478                Assembly Version:  01.01
Date:         05-28-2013                Assembly Flags:    0x00
Version:      REV 01                CLEI Code:        IPUPAKRKAA
ID: DC 52V Power Supply Module        FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 32 31 30 31 35 43 00 00 1c 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d

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Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 1          REV 01  740-050037  1EDB321015J  DC 52V Power Supply
Module
Jedec Code:    0x7fb0          EEPROM Version:  0x02
P/N:           740-050037      S/N:             1EDB321015J
Assembly ID:   0x0478          Assembly Version: 01.01
Date:          05-28-2013      Assembly Flags:   0x00
Version:       REV 01          CLEI Code:        IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 32 31 30 31 35 4a 00 00 1c 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 2          REV 01  740-050037  1EDB32000K8  DC 52V Power Supply
Module
Jedec Code:    0x7fb0          EEPROM Version:  0x02
P/N:           740-050037      S/N:             1EDB32000K8
Assembly ID:   0x0478          Assembly Version: 01.01
Date:          05-23-2013      Assembly Flags:   0x00
Version:       REV 01          CLEI Code:        IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 32 30 30 30 4b 38 00 00 17 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 3          REV 01  740-050037  1EDB32101JW  DC 52V Power Supply
Module
Jedec Code:    0x7fb0          EEPROM Version:  0x02
P/N:           740-050037      S/N:             1EDB32101JW
Assembly ID:   0x0478          Assembly Version: 01.01
Date:          05-30-2013      Assembly Flags:   0x00
Version:       REV 01          CLEI Code:        IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 32 31 30 31 4a 57 00 00 1e 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00

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PSM 4          REV 01  740-050037  1EDB321015G  DC 52V Power Supply
Module
Jedec Code:    0x7fb0          EEPROM Version:  0x02
P/N:           740-050037      S/N:            1EDB321015G
Assembly ID:   0x0478          Assembly Version: 01.01
Date:          05-28-2013      Assembly Flags:  0x00
Version:       REV 01          CLEI Code:       IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 32 31 30 31 35 47 00 00 1c 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00

PSM 5          REV 01  740-050037  1EDB32101HH  DC 52V Power Supply
Module
Jedec Code:    0x7fb0          EEPROM Version:  0x02
P/N:           740-050037      S/N:            1EDB32101HH
Assembly ID:   0x0478          Assembly Version: 01.01
Date:          05-30-2013      Assembly Flags:  0x00
Version:       REV 01          CLEI Code:       IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 32 31 30 31 48 48 00 00 1e 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00

PSM 6          REV 01  740-050037  1EDB32101HD  DC 52V Power Supply
Module
Jedec Code:    0x7fb0          EEPROM Version:  0x02
P/N:           740-050037      S/N:            1EDB32101HD
Assembly ID:   0x0478          Assembly Version: 01.01
Date:          05-30-2013      Assembly Flags:  0x00
Version:       REV 01          CLEI Code:       IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 32 31 30 31 48 44 00 00 1e 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00

PSM 7          REV 01  740-050037  1EDB321015F  DC 52V Power Supply
Module
Jedec Code:    0x7fb0          EEPROM Version:  0x02

```

```

P/N:          740-050037      S/N:          1EDB321015F
Assembly ID:  0x0478         Assembly Version: 01.01
Date:         05-28-2013     Assembly Flags:  0x00
Version:      REV 01         CLEI Code:       IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 31 30 31 35 46 00 00 1c 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 8          REV 01      740-050037      1EDB321015B      DC 52V Power Supply
Module
Jedec Code:    0x7fb0        EEPROM Version: 0x02
P/N:          740-050037      S/N:          1EDB321015B
Assembly ID:   0x0478         Assembly Version: 01.01
Date:         05-28-2013     Assembly Flags:  0x00
Version:      REV 01         CLEI Code:       IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 31 30 31 35 42 00 00 1c 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PDM 0          REV 03      740-045234      1EFA3220433      DC Power Dist Module
Jedec Code:    0x7fb0        EEPROM Version: 0x02
P/N:          740-045234      S/N:          1EFA3220433
Assembly ID:   0x047b         Assembly Version: 01.03
Date:         05-30-2013     Assembly Flags:  0x00
Version:      REV 03         CLEI Code:       IPUPAJSKAA
ID: DC Power Dist Module     FRU Model Number: MX2000-PDM-DC-S
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 7b 01 03 52 45 56 20 30 33 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 32 33 34 00 00
  Address 0x20: 31 45 46 41 33 32 32 30 34 33 33 00 00 1e 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4a 53 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 44 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 33 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 1d 00 00 00 00 00 00 00 00 00 00 00 00
PDM 1          REV 03      740-045234      1EFA3220425      DC Power Dist Module
Jedec Code:    0x7fb0        EEPROM Version: 0x02
P/N:          740-045234      S/N:          1EFA3220425
Assembly ID:   0x047b         Assembly Version: 01.03
Date:         05-30-2013     Assembly Flags:  0x00
Version:      REV 03         CLEI Code:       IPUPAJSKAA
ID: DC Power Dist Module     FRU Model Number: MX2000-PDM-DC-S

```

```

Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
..

```

### show chassis hardware (MX2020 Router)

```
user@host > show chassis hardware
```

```
Hardware inventory:
```

Item	Version	Part number	Serial number	Description
Chassis			JN11E2227AFJ	MX2020
Midplane	REV 27	750-040240	ABAB9384	Lower Power Midplane
Midplane 1	REV 04	711-032386	ABAB9386	Upper Backplane
PMP 1	REV 05	711-032428	ACAJ1579	Upper Power Midplane
PMP 0	REV 04	711-032426	ACAJ1524	Lower Power Midplane
FPM Board	REV 06	760-040242	ABBT8837	Front Panel Display
PSM 0	REV 01	740-045050	1E022240056	DC 52V Power Supply
Module				
PSM 1	REV 01	740-045050	1E022240054	DC 52V Power Supply
Module				
PSM 2	REV 01	740-045050	1E02224005H	DC 52V Power Supply
Module				
PSM 3	REV 01	740-045050	1E022240053	DC 52V Power Supply
Module				
PSM 4	REV 01	740-045050	1E02224004K	DC 52V Power Supply
Module				
PSM 7	REV 01	740-045050	1E02224006W	DC 52V Power Supply
Module				
PSM 8	REV 01	740-045050	1E022240062	DC 52V Power Supply
Module				
PSM 9	REV 01	740-045050	1E02224005B	DC 52V Power Supply
Module				
PSM 10	REV 01	740-045050	1E02224005A	DC 52V Power Supply
Module				
PSM 11	REV 01	740-045050	1E022240052	DC 52V Power Supply
Module				
PSM 12	REV 01	740-045050	1E022240051	DC 52V Power Supply
Module				
PSM 13	REV 01	740-045050	1E022240058	DC 52V Power Supply
Module				
PSM 14	REV 01	740-045050	1E02224004L	DC 52V Power Supply
Module				
PSM 15	REV 01	740-045050	1E02224005M	DC 52V Power Supply
Module				
PSM 16	REV 01	740-045050	1E02224006S	DC 52V Power Supply
Module				
PSM 17	REV 01	740-045050	1E02224005Z	DC 52V Power Supply
Module				
PDM 0	REV 01	740-045234	1E012150033	DC Power Dist Module
PDM 1	REV 01	740-045234	1E012150027	DC Power Dist Module
PDM 2	REV 01	740-045234	1E012150028	DC Power Dist Module
PDM 3	REV 01	740-045234	1E012150045	DC Power Dist Module
Routing Engine 0	REV 02	740-041821	9009089704	RE-S-1800x4
Routing Engine 1	REV 02	740-041821	9009094138	RE-S-1800x4
CB 0	REV 14	750-040257	CAAF8430	Control Board
CB 1	REV 08	750-040257	CAAB3482	Control Board
SPMB 0	REV 01	711-041855	ZS2290	PMB Board
SPMB 1	REV 02	711-041855	CAAA6141	PMB Board
SFB 0	REV 03	711-044466	ABBV6789	Switch Fabric Board
SFB 1	REV 05	711-044466	ABBX5666	Switch Fabric Board

SFB 2	REV 05	711-044466	ABBX5678	Switch Fabric Board
SFB 3	REV 05	711-044466	ABBX5687	Switch Fabric Board
SFB 4	REV 05	711-044466	ABBX5609	Switch Fabric Board
SFB 5	REV 05	711-044466	ABBX5675	Switch Fabric Board
SFB 6	REV 03	711-044466	ABBV6805	Switch Fabric Board
SFB 7	REV 05	711-044466	ABBX5701	Switch Fabric Board
FPC 0	REV 30	750-028467	ABBN0284	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBN0507	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E00990	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E04357	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11F01327	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E04375	SFP+-10G-USR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E02760	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E02904	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E03963	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E00756	SFP+-10G-USR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E04418	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E01077	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E01128	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11F01253	SFP+-10G-USR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E01140	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11F01626	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E01075	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E01177	SFP+-10G-USR
FPC 1	REV 30	750-028467	ABBN0208	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABB11084	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E04745	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11F01570	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E04388	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11F01439	SFP+-10G-USR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E04739	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11F01869	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11F01675	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11F01901	SFP+-10G-USR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11F01346	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11F01288	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11F01824	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E04312	SFP+-10G-USR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E02811	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E03847	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11F01495	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11F01265	SFP+-10G-USR
FPC 2	REV 30	750-028467	ZM5111	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ZP6607	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80LJA	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80MFZ	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80NKL	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80KF4	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80FBJ	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80MM2	SFP+-10G-SR

Xcvr 2	REV 01	740-031980	AK80LJV	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80NXV	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80N1H	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80NLS	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80FL5	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80NL9	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80NG2	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80KDU	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80MG1	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80MM0	SFP+-10G-SR
FPC 3	REV 30	750-028467	ABBN0302	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBN0495	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11F01581	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E01176	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11F01251	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E02752	SFP+-10G-USR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E00786	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E01020	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E01023	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E02819	SFP+-10G-USR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E02812	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11D04437	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11F01279	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11F01333	SFP+-10G-USR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E00978	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E01018	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11F01784	SFP+-10G-USR
Xcvr 3	REV 01	740-031980	AK80NKP	SFP+-10G-SR
FPC 4	REV 30	750-028467	ABBN0308	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBJ1095	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E04305	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E01147	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E01195	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11F01743	SFP+-10G-USR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11F01892	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E02880	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E00725	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E01057	SFP+-10G-USR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E02816	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11C04501	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E02764	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E00789	SFP+-10G-USR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11F01250	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E02847	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E00787	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E03803	SFP+-10G-USR
FPC 5	REV 30	750-028467	ABBN0316	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBJ1082	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	B11K00523	SFP+-10G-SR



Xcvr 1	REV 01	740-031980	B11K01848	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B11K01865	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B11K00540	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	B11K00422	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11K00428	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B11K00423	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B11K01855	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	B11K01847	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11K00526	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B11K00529	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B11K00525	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	B11K00425	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11K00530	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B11K01851	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B11K00528	SFP+-10G-SR
FPC 6	REV 32	750-028467	ABBN6832	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBK6534	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80MB4	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80FQ6	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80N1F	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80NLQ	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80KDR	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80FGJ	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80N5G	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80KD8	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80LET	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80N1X	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80NRF	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80NL2	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80N3D	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80MRB	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80LEQ	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80LER	SFP+-10G-SR
FPC 7	REV 32	750-028467	ABBN6811	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBN7288	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80NK8	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80LJC	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80LBU	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80N21	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80LEU	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80NLM	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80NL6	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80LES	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80LEN	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80ME0	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80LMG	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80MM1	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80MG7	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80KF9	SFP+-10G-SR

Xcvr 2	REV 01	740-031980	AK80NRQ	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80NLE	SFP+-10G-SR
FPC 8	REV 23	750-028467	YN2977	MPC 3D 16x 10GE
CPU	REV 10	711-029089	YP1856	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	183363A00875	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	183363A00851	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	183363A00772	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	183363A00882	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	183363A00735	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	183363A00169	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	183363A00726	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	183363A00077	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	183363A00168	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	183363A00676	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	183363A00732	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	183363A00091	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	183363A00725	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	183363A00642	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	183363A00871	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	183363A00853	SFP+-10G-SR
FPC 9	REV 32	750-028467	ABBN6798	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBK6556	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	9ZD206A00055	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	183363A00239	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AD0915E003K	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AD0915E003A	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80MRC	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80NLS	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80NKN	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80N3U	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80N1T	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AJ808DJ	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80NG4	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80FND	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80FKQ	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80NLT	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80NKR	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80LKM	SFP+-10G-SR
FPC 10	REV 32	750-028467	ABBN6813	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBK6542	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80NA3	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80NLF	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80MRH	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80KE4	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	973152A00030	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80L9H	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80ME8	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80NLR	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80NG1	SFP+-10G-SR

Xcvr 1	REV 01	740-031980	AK80MCA	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80LFC	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80LEM	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80N9X	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80LAC	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80LF2	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80N8T	SFP+-10G-SR
FPC 11	REV 30	750-028467	ABBN0281	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBN0526	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11F01326	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E03973	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E00950	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E00674	SFP+-10G-USR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E00775	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E04461	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E01074	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E02821	SFP+-10G-USR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E04501	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E00757	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11F01623	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E01022	SFP+-10G-USR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E04359	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E02751	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E02736	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E01178	SFP+-10G-USR
FPC 12	REV 32	750-028467	ABBN6796	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBN7259	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	B11K01856	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11K01853	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B11K01863	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	163363A02863	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A02668	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	163363A02881	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	163363A01671	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	163363A02627	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A02725	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	163363A02692	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	163363A02730	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	163363A03081	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A02736	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	163363A02568	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	163363A02747	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	163363A02579	SFP+-10G-SR
FPC 13	REV 30	750-028467	ABBN0270	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABB30966	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80NL1	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80NXW	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80KD2	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80FMD	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+

Xcvr 0	REV 01	740-031980	AK80NKQ	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80MGH	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80N38	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80NL7	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80LEL	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80NKD	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80KCY	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80LHK	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80M5J	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80MBE	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80NLG	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80LFH	SFP+-10G-SR
FPC 14	REV 32	750-028467	ABBN6790	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBK6515	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80LZM	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80MCC	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80KCM	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80KE0	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021310	C10F99155	SFP+-10G-LRM
Xcvr 1	REV 01	740-021310	C10F99049	SFP+-10G-LRM
Xcvr 2	REV 01	740-021310	C10F99128	SFP+-10G-LRM
Xcvr 3	REV 01	740-021310	C10F99169	SFP+-10G-LRM
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80LF3	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	163363A02597	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	163363A03060	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	163363A03057	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80LEX	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80FEU	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80FNM	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AJQQ05G	SFP+-10G-SR
FPC 15	REV 32	750-028467	ABBN6791	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBN7289	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	B11K00424	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11K01849	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B11K01862	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B11K01852	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	B11K00427	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11K00430	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B11K01854	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B11K00426	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	B11K00429	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11K01864	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B11K01850	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B11K00522	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E01144	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E00985	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E00796	SFP+-10G-USR
Xcvr 3	REV 01	740-031980	B11K01866	SFP+-10G-SR
FPC 16	REV 30	750-028467	ABBM4592	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBN0465	AMPC PMB

PIC 0			BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11F01435	SFP+-10G-USR	
Xcvr 1	REV 01	740-030658	B11E01052	SFP+-10G-USR	
Xcvr 2	REV 01	740-030658	B11F01328	SFP+-10G-USR	
Xcvr 3	REV 01	740-030658	B11F01254	SFP+-10G-USR	
PIC 1			BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E02738	SFP+-10G-USR	
Xcvr 1	REV 01	740-030658	B11E02881	SFP+-10G-USR	
Xcvr 2	REV 01	740-030658	B11F01624	SFP+-10G-USR	
Xcvr 3	REV 01	740-030658	B11E00889	SFP+-10G-USR	
PIC 2			BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E02883	SFP+-10G-USR	
Xcvr 1	REV 01	740-030658	B11E00681	SFP+-10G-USR	
Xcvr 2	REV 01	740-030658	B11E04306	SFP+-10G-USR	
Xcvr 3	REV 01	740-030658	B11E02813	SFP+-10G-USR	
PIC 3			BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11F01801	SFP+-10G-USR	
Xcvr 1	REV 01	740-030658	B11E02753	SFP+-10G-USR	
Xcvr 2	REV 01	740-030658	B11E01156	SFP+-10G-USR	
Xcvr 3	REV 01	740-030658	B11E04324	SFP+-10G-USR	
FPC 17	REV 32	750-028467	ABBN6810	MPC 3D 16x 10GE	
CPU	REV 10	711-029089	ABBN7237	AMPC PMB	
PIC 0			BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A02638	SFP+-10G-SR	
Xcvr 1	REV 01	740-031980	163363A02082	SFP+-10G-SR	
Xcvr 2	REV 01	740-031980	163363A01674	SFP+-10G-SR	
Xcvr 3	REV 01	740-031980	163363A03058	SFP+-10G-SR	
PIC 1			BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A03048	SFP+-10G-SR	
Xcvr 1	REV 01	740-031980	163363A02729	SFP+-10G-SR	
Xcvr 2	REV 01	740-031980	163363A02566	SFP+-10G-SR	
Xcvr 3	REV 01	740-031980	163363A02567	SFP+-10G-SR	
PIC 2			BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A02878	SFP+-10G-SR	
Xcvr 1	REV 01	740-031980	163363A02739	SFP+-10G-SR	
Xcvr 2	REV 01	740-031980	163363A01959	SFP+-10G-SR	
Xcvr 3	REV 01	740-031980	163363A02660	SFP+-10G-SR	
PIC 3			BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A02731	SFP+-10G-SR	
Xcvr 1	REV 01	740-031980	163363A02588	SFP+-10G-SR	
Xcvr 2	REV 01	740-031980	163363A02673	SFP+-10G-SR	
Xcvr 3	REV 01	740-031980	163363A02654	SFP+-10G-SR	
FPC 18	REV 30	750-028467	ABBM4739	MPC 3D 16x 10GE	
CPU	REV 10	711-029089	ABBN0487	AMPC PMB	
PIC 0			BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A02569	SFP+-10G-SR	
Xcvr 1	REV 01	740-031980	163363A02886	SFP+-10G-SR	
Xcvr 2	REV 01	740-031980	163363A03082	SFP+-10G-SR	
Xcvr 3	REV 01	740-031980	133363A00297	SFP+-10G-SR	
PIC 1			BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A02726	SFP+-10G-SR	
Xcvr 1	REV 01	740-031980	163363A03050	SFP+-10G-SR	
Xcvr 2	REV 01	740-031980	163363A02884	SFP+-10G-SR	
Xcvr 3	REV 01	740-031980	163363A03076	SFP+-10G-SR	
PIC 2			BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A02581	SFP+-10G-SR	
Xcvr 1	REV 01	740-031980	163363A02873	SFP+-10G-SR	
Xcvr 2	REV 01	740-031980	163363A02582	SFP+-10G-SR	
Xcvr 3	REV 01	740-031980	163363A03083	SFP+-10G-SR	
PIC 3			BUILTIN	BUILTIN	4x 10GE(LAN) SFP+

Xcvr 0	REV 01	740-031981	UL70BU6	SFP+-10G-LR
Xcvr 1	REV 01	740-031981	UL50QC6	SFP+-10G-LR
Xcvr 2	REV 01	740-031981	UL708N6	SFP+-10G-LR
Xcvr 3	REV 01	740-031981	UL603KK	SFP+-10G-LR
FPC 19	REV 32	750-028467	ABBN6827	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBK6508	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A01688	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	163363A01724	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	163363A01773	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	163363A02593	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A03061	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	163363A03056	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	163363A02669	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	163363A03070	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A02572	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	163363A02697	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	163363A02585	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	163363A03052	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A02591	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	163363A02649	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	163363A02577	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	163363A02698	SFP+-10G-SR
ADC 0	REV 13	750-043596	ABBX5561	Adapter Card
ADC 1	REV 13	750-043596	ABBX5546	Adapter Card
ADC 2	REV 13	750-043596	ABBX5535	Adapter Card
ADC 3	REV 13	750-043596	ABBX5552	Adapter Card
ADC 4	REV 13	750-043596	ABBX5581	Adapter Card
ADC 5	REV 13	750-043596	ABBX5545	Adapter Card
ADC 6	REV 13	750-043596	ABBX5554	Adapter Card
ADC 7	REV 07	750-043596	ABBV7194	Adapter Card
ADC 8	REV 07	750-043596	ABBV7251	Adapter Card
ADC 9	REV 07	750-043596	ABBV7202	Adapter Card
ADC 10	REV 13	750-043596	ABBX5538	Adapter Card
ADC 11	REV 13	750-043596	ABBX5566	Adapter Card
ADC 12	REV 13	750-043596	ABBX5542	Adapter Card
ADC 13	REV 13	750-043596	ABBX5539	Adapter Card
ADC 14	REV 13	750-043596	ABBX5555	Adapter Card
ADC 15	REV 13	750-043596	ABBX5557	Adapter Card
ADC 16	REV 13	750-043596	ABBX5536	Adapter Card
ADC 17	REV 13	750-043596	ABBX5559	Adapter Card
ADC 18	REV 13	750-043596	ABBX5537	Adapter Card
ADC 19	REV 11	750-043596	ABBW5685	Adapter Card
Fan Tray 0	REV 2A	760-046960	ACAY0030	172mm FanTray - 6 Fans
Fan Tray 1	REV 2A	760-046960	ACAY0039	172mm FanTray - 6 Fans
Fan Tray 2	REV 2A	760-046960	ACAY0033	172mm FanTray - 6 Fans
Fan Tray 3	REV 2A	760-046960	ACAY0062	172mm FanTray - 6 Fans

### show chassis hardware detail (MX2020 Router)

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user@host> show chassis hardware detail
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Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN11E2227AFJ	MX2020
Midplane	REV 27	750-040240	ABAB9384	Lower Power Midplane
Midplane 1	REV 04	711-032386	ABAB9386	Upper Backplane

PMP 1	REV 05	711-032428	ACAJ1821	Upper Power Midplane
PMP 0	REV 04	711-032426	ACAJ1524	Lower Power Midplane
FPM Board	REV 06	760-040242	ABBT8837	Front Panel Display
PSM 0	REV 01	740-045050	1E02224006G	DC 52V Power Supply
Module				
PSM 1	REV 01	740-045050	1E022240053	DC 52V Power Supply
Module				
PSM 2	REV 01	740-045050	1E02224004K	DC 52V Power Supply
Module				
PSM 3	REV 01	740-045050	1E022240056	DC 52V Power Supply
Module				
PSM 4	REV 01	740-045050	1E022240054	DC 52V Power Supply
Module				
PSM 5	REV 01	740-045050	1E02224005H	DC 52V Power Supply
Module				
PSM 6	REV 01	740-045050	1E02224006S	DC 52V Power Supply
Module				
PSM 7	REV 01	740-045050	1E02224005M	DC 52V Power Supply
Module				
PSM 8	REV 01	740-045050	1E022240062	DC 52V Power Supply
Module				
PSM 9	REV 03	740-045050	1EDB2350095	DC 52V Power Supply
Module				
PSM 10	REV 03	740-045050	1EDB235009L	DC 52V Power Supply
Module				
PSM 11	REV 03	740-045050	1EDB2350092	DC 52V Power Supply
Module				
PSM 12	REV 03	740-045050	1EDB23500AT	DC 52V Power Supply
Module				
PSM 13	REV 03	740-045050	1EDB2350094	DC 52V Power Supply
Module				
PSM 15	REV 03	740-045050	1EDB235008X	DC 52V Power Supply
Module				
PDM 0	REV 01	740-045234	1E012150033	DC Power Dist Module
PDM 1	REV 01	740-045234	1E012150027	DC Power Dist Module
PDM 2	REV 01	740-045234	1E262250072	DC Power Dist Module
Routing Engine 0	REV 02	740-041821	9009094138	RE-S-1800x4
ad0 3998 MB		Virtium - TuffDisk	VCF3 20110825A021D0000064	Compact Flash
ad1 30533 MB		UGB94ARF32H0S3-KC	UNIGEN-499551-000347	Disk 1
usb0 (addr 1)		EHCI root hub 0	Intel	uhub0
usb0 (addr 2)		product 0x0020 32	vendor 0x8087	uhub1
DIMM 0		SGU04G72H1BD2SA-BB	DIE REV-52 PCB REV-54	MFR ID-ce80
DIMM 1		SGU04G72H1BD2SA-BB	DIE REV-52 PCB REV-54	MFR ID-ce80
DIMM 2		SGU04G72H1BD2SA-BB	DIE REV-52 PCB REV-54	MFR ID-ce80
DIMM 3		SGU04G72H1BD2SA-BB	DIE REV-52 PCB REV-54	MFR ID-ce80
Routing Engine 1	REV 02	740-041821	9009089709	RE-S-1800x4
ad0 3831 MB		UGB30SFA4000T1	SFA4000T1 00000113	Compact Flash
ad1 30533 MB		UGB94ARF32H0S3-KC	UNIGEN-478612-001044	Disk 1
CB 0	REV 08	750-040257	CAAB3482	Control Board
CB 1	REV 04	750-040257	ZT2864	Control Board
SPMB 0	REV 02	711-041855	CAA6141	PMB Board
SPMB 1	REV 01	711-041855	ZS2275	PMB Board
SFB 0	REV 05	711-044466	ABBT2161	Switch Fabric Board
SFB 1	REV 05	711-044466	ABBT2159	Switch Fabric Board
SFB 2	REV 05	711-044466	ABBX3718	Switch Fabric Board
SFB 3	REV 05	711-044466	ABBT2152	Switch Fabric Board
SFB 4	REV 05	711-044466	ABBT2160	Switch Fabric Board
SFB 5	REV 05	711-044466	ABBT2145	Switch Fabric Board
SFB 6	REV 05	711-044466	ABBT2150	Switch Fabric Board
SFB 7	REV 05	711-044466	ABBT2163	Switch Fabric Board

FPC 0	REV 30	750-028467	ABBN0284	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBN0507	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E00990	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E04357	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11F01327	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E04375	SFP+-10G-USR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E02760	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E02904	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E03963	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E00756	SFP+-10G-USR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E04418	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E01077	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E01128	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11F01253	SFP+-10G-USR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E01140	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11F01626	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E01075	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E01177	SFP+-10G-USR
FPC 1	REV 30	750-028467	ABBN0308	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBN1095	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E04305	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E01147	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E01195	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11F01743	SFP+-10G-USR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11F01892	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E02880	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E00725	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E01057	SFP+-10G-USR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E02816	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11C04501	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E02764	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E00789	SFP+-10G-USR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11F01250	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E02847	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E00787	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E03803	SFP+-10G-USR
FPC 2	REV 30	750-028467	ABBN0316	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBN1082	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	B11K00523	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11K01848	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B11K01865	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B11K00540	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	B11K00422	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11K00428	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B11K00423	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B11K01855	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	B11K01847	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11K00526	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B11K00529	SFP+-10G-SR



Xcvr 3	REV 01	740-031980	B11K00525	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	B11K00425	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11K00530	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B11K01851	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B11K00528	SFP+-10G-SR
FPC 3	REV 32	750-028467	ABBN6832	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBK6534	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80MB4	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80FQ6	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80N1F	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80NLQ	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80KDR	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80FGJ	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80N5G	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80KD8	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80LET	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80N1X	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80NRF	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80NL2	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80N3D	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80MRB	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80LEQ	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80LER	SFP+-10G-SR
FPC 4	REV 32	750-028467	ABBN6811	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBN7288	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80NK8	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80LJC	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80LBU	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80N21	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80LEU	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80NLM	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80NL6	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80LES	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80LEN	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80ME0	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80LMG	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80MM1	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80MG7	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80KF9	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80NRQ	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80NLE	SFP+-10G-SR
FPC 5	REV 32	750-028467	ABBN6791	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBN7289	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	B11K00424	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11K01849	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B11K01862	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B11K01852	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP
Xcvr 0	REV 01	740-031980	B11K00427	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11K00430	SFP+-10G-SR

Xcvr 2	REV 01	740-031980	B11K01854	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B11K00426	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	B11K00429	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11K01864	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B11K01850	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B11K00522	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E01144	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E00985	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E00796	SFP+-10G-USR
Xcvr 3	REV 01	740-031980	B11K01866	SFP+-10G-SR
FPC 6	REV 30	750-028467	ABBM4592	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBN0465	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11F01435	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E01052	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11F01328	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11F01254	SFP+-10G-USR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E02738	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E02881	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11F01624	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E00889	SFP+-10G-USR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E02883	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E00681	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E04306	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E02813	SFP+-10G-USR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11F01801	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E02753	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E01156	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E04324	SFP+-10G-USR
FPC 7	REV 32	750-028467	ABBN6810	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBN7237	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A03058	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	163363A02082	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	163363A01674	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	163363A02638	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A03048	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	163363A02729	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	163363A02566	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	163363A02567	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A02878	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	163363A02739	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	163363A01959	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	163363A02660	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A02731	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	163363A02588	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	163363A02673	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	163363A02654	SFP+-10G-SR
FPC 8	REV 30	750-028467	ABBM4739	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBN0487	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A02569	SFP+-10G-SR

Xcvr 1	REV 01	740-031980	163363A02886	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	163363A03082	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	133363A00297	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A02726	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	163363A03050	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	163363A02884	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	163363A03076	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A02581	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	163363A02873	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	163363A02582	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	163363A03083	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031981	UL70BU6	SFP+-10G-LR
Xcvr 1	REV 01	740-031981	UL50QC6	SFP+-10G-LR
Xcvr 2	REV 01	740-031981	UL708N6	SFP+-10G-LR
Xcvr 3	REV 01	740-031981	UL603KK	SFP+-10G-LR
FPC 9	REV 32	750-028467	ABBN6827	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBN6508	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A01688	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	163363A01724	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	163363A01773	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	163363A02593	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A03061	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	163363A03056	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	163363A02669	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	163363A03070	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A02572	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	163363A02697	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	163363A02585	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	163363A03052	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A02591	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	163363A02649	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	163363A02577	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	163363A02698	SFP+-10G-SR
FPC 10	REV 30	750-028467	ABBN0302	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBN0495	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11F01581	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E01176	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11F01251	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E02752	SFP+-10G-USR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E00786	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E01020	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E01023	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E02819	SFP+-10G-USR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E02812	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11D04437	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11F01279	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11F01333	SFP+-10G-USR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E00978	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E01018	SFP+-10G-USR

Xcvr 2	REV 01	740-030658	B11F01784	SFP+-10G-USR
Xcvr 3	REV 01	740-031980	AK80NKP	SFP+-10G-SR
FPC 11	REV 32	750-028467	ABBN6790	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBK6515	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80LZM	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80MCC	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80KCM	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80KE0	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021310	C10F99155	SFP+-10G-LRM
Xcvr 1	REV 01	740-021310	C10F99049	SFP+-10G-LRM
Xcvr 2	REV 01	740-021310	C10F99128	SFP+-10G-LRM
Xcvr 3	REV 01	740-021310	C10F99169	SFP+-10G-LRM
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80LF3	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	163363A02597	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	163363A03060	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	163363A03057	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80LEX	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80FEU	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80FNM	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AJQ0Q5G	SFP+-10G-SR
FPC 12	REV 30	750-028467	ZM5111	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ZP6607	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80LJA	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80MFZ	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80NKL	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80KF4	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80FBJ	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80MM2	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80LJV	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80NXV	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80N1H	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80NLS	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80FL5	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80NL9	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80NG2	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80KDU	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80MG1	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80MM0	SFP+-10G-SR
FPC 13	REV 30	750-028467	ABBN0208	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABB11084	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E04745	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11F01570	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E04388	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11F01439	SFP+-10G-USR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E04739	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11F01869	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11F01675	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11F01901	SFP+-10G-USR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11F01346	SFP+-10G-USR

Xcvr 1	REV 01	740-030658	B11F01288	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11F01824	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E04312	SFP+-10G-USR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E02811	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E03847	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11F01495	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11F01265	SFP+-10G-USR
FPC 14	REV 23	750-028467	YN2977	MPC 3D 16x 10GE
CPU	REV 10	711-029089	YP1856	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	183363A00875	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	183363A00851	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	183363A00772	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	183363A00882	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	183363A00735	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	183363A00169	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	183363A00726	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	183363A00077	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	183363A00168	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	183363A00676	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	183363A00732	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	183363A00091	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	183363A00725	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	183363A00642	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	183363A00871	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	183363A00853	SFP+-10G-SR
FPC 15	REV 32	750-028467	ABBN6798	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBK6556	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	9ZDZ06A00055	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	183363A00239	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AD0915E003K	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AD0915E003A	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80MRC	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80NL5	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80NKN	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80N3U	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80N1T	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AJ808DJ	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80NG4	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80FND	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80FKQ	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80NLT	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80NKR	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80LKM	SFP+-10G-SR
FPC 16	REV 30	750-028467	ABBN0270	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABB30966	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80NL1	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80NXW	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80KD2	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80FMD	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+

Xcvr 0	REV 01	740-031980	AK80NKQ	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80MGH	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80N38	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80NL7	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80M5J	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80NKD	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80KCY	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80LHK	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80LEL	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80MBE	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80NLG	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80LFH	SFP+-10G-SR
FPC 17	REV 32	750-028467	ABBN6796	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBN7259	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	B11K01856	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11K01853	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B11K01863	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	163363A02863	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A02668	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	163363A02881	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	163363A01671	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	163363A02627	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A02725	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	163363A02692	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	163363A02730	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	163363A03081	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	163363A02736	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	163363A02568	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	163363A02747	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	163363A02579	SFP+-10G-SR
FPC 18	REV 30	750-028467	ABBN0281	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBN0526	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11F01326	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E03973	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E00950	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E00674	SFP+-10G-USR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E00775	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E04461	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E01074	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E02821	SFP+-10G-USR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E04501	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E00757	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11F01623	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E01022	SFP+-10G-USR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-030658	B11E04359	SFP+-10G-USR
Xcvr 1	REV 01	740-030658	B11E02751	SFP+-10G-USR
Xcvr 2	REV 01	740-030658	B11E02736	SFP+-10G-USR
Xcvr 3	REV 01	740-030658	B11E01178	SFP+-10G-USR
FPC 19	REV 32	750-028467	ABBN6813	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABBK6542	AMPC PMB

PIC 0			BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80NA3		SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80NLF		SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80MRH		SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80KE4		SFP+-10G-SR
PIC 1			BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	973152A00030		SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80L9H		SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80ME8		SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80NLR		SFP+-10G-SR
PIC 2			BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80NG1		SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80MCA		SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80LFC		SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80LEM		SFP+-10G-SR
PIC 3			BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80N9X		SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AK80LAC		SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80LF2		SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AK80N8T		SFP+-10G-SR
ADC 0	REV 13	750-043596	ABBX5561		Adapter Card
ADC 1	REV 13	750-043596	ABBX5546		Adapter Card
ADC 2	REV 13	750-043596	ABBX5535		Adapter Card
ADC 3	REV 13	750-043596	ABBX5552		Adapter Card
ADC 4	REV 13	750-043596	ABBX5581		Adapter Card
ADC 5	REV 13	750-043596	ABBX5545		Adapter Card
ADC 6	REV 13	750-043596	ABBX5554		Adapter Card
ADC 7	REV 07	750-043596	ABBV7194		Adapter Card
ADC 8	REV 07	750-043596	ABBV7251		Adapter Card
ADC 9	REV 07	750-043596	ABBV7202		Adapter Card
ADC 10	REV 13	750-043596	ABBX5579		Adapter Card
ADC 11	REV 13	750-043596	ABBX5548		Adapter Card
ADC 12	REV 13	750-043596	ABBX5575		Adapter Card
ADC 13	REV 13	750-043596	ABBX5539		Adapter Card
ADC 14	REV 13	750-043596	ABBX5555		Adapter Card
ADC 15	REV 13	750-043596	ABBX5557		Adapter Card
ADC 16	REV 13	750-043596	ABBX5536		Adapter Card
ADC 17	REV 13	750-043596	ABBX5559		Adapter Card
ADC 18	REV 13	750-043596	ABBX5537		Adapter Card
ADC 19	REV 11	750-043596	ABBW5685		Adapter Card
Fan Tray 0	REV 04	760-046960	ACAY0090		172mm FanTray - 6 Fans
Fan Tray 1	REV 04	760-046960	ACAY0088		172mm FanTray - 6 Fans
Fan Tray 2	REV 04	760-046960	ACAY0089		172mm FanTray - 6 Fans
Fan Tray 3	REV 04	760-046960	ACAY0108		172mm FanTray - 6 Fans

### show chassis hardware (MX2020 Router with 240-V high-voltage DC PSMs and PDMs)

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Hardware inventory:					
Item	Version	Part number	Serial number	Description	
Chassis			JN1248551AFJ	MX2020	
Midplane	REV 51	750-040240	ABAD0719	Lower Backplane	
Midplane 1	REV 06	711-032386	ABAD1385	Upper Backplane	
PMP 1	REV 05	711-032428	ACAJ3828	Upper Power Midplane	
PMP 0	REV 04	711-032426	ACAJ3642	Lower Power Midplane	
FPM Board	REV 13	760-040242	ABCX9082	Front Panel Display	
PSM 0	Rev 02	740-078881	1EDX813007L	MX2K 240V HVDC PSM	
PSM 1	Rev 02	740-078881	1EDX81300BB	MX2K 240V HVDC PSM	

PSM 2	Rev 02	740-078881	1EDX81300AD	MX2K 240V HVDC PSM
PSM 3	Rev 02	740-078881	1EDX813007D	MX2K 240V HVDC PSM
PSM 4	Rev 02	740-078881	1EDX81300AY	MX2K 240V HVDC PSM
PSM 5	Rev 02	740-078881	1EDX813009B	MX2K 240V HVDC PSM
PSM 6	Rev 02	740-078881	1EDX81300AB	MX2K 240V HVDC PSM
PSM 7	Rev 02	740-078881	1EDX81300A4	MX2K 240V HVDC PSM
PSM 8	Rev 02	740-078881	1EDX81300A6	MX2K 240V HVDC PSM
PSM 9	Rev 02	740-078881	1EDX81300AE	MX2K 240V HVDC PSM
PSM 10	Rev 02	740-078881	1EDX813007N	MX2K 240V HVDC PSM
PSM 11	Rev 02	740-078881	1EDX813009F	MX2K 240V HVDC PSM
PSM 12	Rev 02	740-078881	1EDX81300B3	MX2K 240V HVDC PSM
PSM 13	Rev 02	740-078881	1EDX813008W	MX2K 240V HVDC PSM
PSM 14	Rev 02	740-078881	1EDX813007M	MX2K 240V HVDC PSM
PSM 15	Rev 02	740-078881	1EDX81300AL	MX2K 240V HVDC PSM
PSM 16	Rev 02	740-078881	1EDX813009E	MX2K 240V HVDC PSM
PSM 17	Rev 02	740-078881	1EDX81300A7	MX2K 240V HVDC PSM
PDM 0	REV 01	740-079470	1EFH8130057	MX2K 240V HVDC PDM
PDM 1	REV 01	740-079470	1EFH8130051	MX2K 240V HVDC PDM
PDM 2	REV 01	740-079470	1EFH8130039	MX2K 240V HVDC PDM
PDM 3	REV 01	740-079470	1EFH8130036	MX2K 240V HVDC PDM
Routing Engine 0	REV 03	740-031114	9009053584	RE-S-1800x2
Routing Engine 1	REV 02	740-041821	9009099699	RE-S-1800x4
CB 0	REV 20	750-040257	CAAJ5213	Control Board
CB 1	REV 12	750-040257	CAAD9490	Control Board
SPMB 0	REV 02	711-041855	ABBX5197	PMB Board
SPMB 1	REV 02	711-041855	ABBS1487	PMB Board
SFB 0	REV 05	711-044466	ABBX5586	Switch Fabric Board
SFB 1	REV 06	711-044466	ABCD9861	Switch Fabric Board
SFB 2	REV 06	711-044466	ABCG3642	Switch Fabric Board
SFB 3	REV 06	711-044466	ABCG3670	Switch Fabric Board
SFB 4	REV 06	711-044466	ABCG3676	Switch Fabric Board
SFB 5	REV 06	711-044466	ABCY1288	Switch Fabric Board
SFB 6	REV 06	711-044466	ABCG3657	Switch Fabric Board
SFB 7	REV 06	711-044466	ABCG3704	Switch Fabric Board
FPC 0	REV 02	750-038060	CAAD2115	Load DPC
FPC 1	REV 02	750-038060	CAAD2121	Load DPC
FPC 2	REV 01	750-038060	ZS4429	Load DPC
FPC 3	REV 02	750-038060	CAAE6456	Load DPC
FPC 4	REV 02	750-038060	CAAD2111	Load DPC
FPC 5	REV 07	750-038060	CAJW7933	Load DPC
FPC 6	REV 07	750-038060	CAJW7983	Load DPC
FPC 7	REV 02	750-038060	CAAD2124	Load DPC
FPC 8	REV 01	750-038060	ZS4443	Load DPC
FPC 9	REV 02	750-038060	CAAD2120	Load DPC
FPC 13	REV 02	750-038060	CAAD2133	Load DPC
FPC 14	REV 02	750-038060	CAAD2116	Load DPC
FPC 15	REV 02	750-038060	CAAE6464	Load DPC
FPC 16	REV 02	750-038060	CAAD2126	Load DPC
FPC 17	REV 02	750-038060	CAAC0099	Load DPC
ADC 0	REV 17	750-043596	ABCA8963	Adapter Card
ADC 1	REV 15	750-043596	ABCA8119	Adapter Card
ADC 2	REV 17	750-043596	ABCG8929	Adapter Card
ADC 3	REV 15	750-043596	ABCA8113	Adapter Card
ADC 4	REV 15	750-043596	ABCA8099	Adapter Card
ADC 5	REV 19	750-043596	ABCG5703	Adapter Card
ADC 6	REV 17	750-043596	ABCG8960	Adapter Card
ADC 7	REV 19	750-043596	ABCD1988	Adapter Card
ADC 8	REV 07	750-043596	ABBV7184	Adapter Card
ADC 9	REV 15	750-043596	ABCA8107	Adapter Card
ADC 12	REV 17	750-043596	ABBZ2297	Adapter Card



ADC 13	REV 17	750-043596	ABCD5500	Adapter Card
ADC 14	REV 17	750-043596	ABCA8981	Adapter Card
ADC 15	REV 19	750-043596	ABBZ4170	Adapter Card
ADC 16	REV 07	750-043596	ABBV7215	Adapter Card
ADC 17	REV 15	750-043596	ABCA8086	Adapter Card
Fan Tray 0	REV 06	760-046960	ACAY0860	172mm FanTray - 6 Fans
Fan Tray 1	REV 06	760-046960	ACAY2638	172mm FanTray - 6 Fans
Fan Tray 2	REV 06	760-046960	ACAY1206	172mm FanTray - 6 Fans
Fan Tray 3	REV 06	760-046960	ACAY2693	172mm FanTray - 6 Fans

### show chassis hardware models (MX2020 Router)

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user@host > show chassis hardware models
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Hardware inventory:

Item	Version	Part number	Serial number	FRU model number
Midplane	REV 27	750-040240	ABAB9384	750-040240
FPM Board	REV 06	760-040242	ABBT8837	760-040242
PSM 0	REV 01	740-045050	1E02224006G	MX2000-PSM-HC-DC-S-A
PSM 1	REV 01	740-045050	1E022240053	MX2000-PSM-HC-DC-S-A
PSM 2	REV 01	740-045050	1E02224004K	MX2000-PSM-HC-DC-S-A
PSM 3	REV 01	740-045050	1E022240056	MX2000-PSM-HC-DC-S-A
PSM 4	REV 01	740-045050	1E022240054	MX2000-PSM-HC-DC-S-A
PSM 5	REV 01	740-045050	1E02224005H	MX2000-PSM-HC-DC-S-A
PSM 6	REV 01	740-045050	1E02224006S	MX2000-PSM-HC-DC-S-A
PSM 7	REV 01	740-045050	1E02224005M	MX2000-PSM-HC-DC-S-A
PSM 8	REV 01	740-045050	1E022240062	MX2000-PSM-HC-DC-S-A
PSM 9	REV 03	740-045050	1EDB2350095	MX2000-PSM-DC-S-A
PSM 10	REV 03	740-045050	1EDB235009L	MX2000-PSM-DC-S-A
PSM 11	REV 03	740-045050	1EDB2350092	MX2000-PSM-DC-S-A
PSM 12	REV 03	740-045050	1EDB23500AT	MX2000-PSM-DC-S-A
PSM 13	REV 03	740-045050	1EDB2350094	MX2000-PSM-DC-S-A
PSM 15	REV 03	740-045050	1EDB235008X	MX2000-PSM-DC-S-A
PDM 0	REV 01	740-045234	1E012150033	
PDM 1	REV 01	740-045234	1E012150027	
PDM 2	REV 01	740-045234	1E262250072	MX2000-PDM-DC-S-A
Routing Engine 0	REV 02	740-041821	9009094138	RE-S-1800X4-16G-S
Routing Engine 1	REV 02	740-041821	9009089709	RE-S-1800X4-16G-S
CB 0	REV 08	750-040257	CAAB3482	750-040257
CB 1	REV 04	750-040257	ZT2864	750-040257
SFB 0	REV 05	711-044466	ABBT2161	MX2000-SFB-S
SFB 1	REV 05	711-044466	ABBT2159	MX2000-SFB-S
SFB 2	REV 05	711-044466	ABBX3718	MX2000-SFB-S
SFB 4	REV 05	711-044466	ABBT2160	MX2000-SFB-S
SFB 5	REV 05	711-044466	ABBT2145	MX2000-SFB-S
SFB 7	REV 05	711-044466	ABBT2163	MX2000-SFB-S
FPC 0	REV 30	750-028467	ABBN0284	MPC-3D-16XGE-SFPP
FPC 1	REV 30	750-028467	ABBN0308	MPC-3D-16XGE-SFPP
FPC 2	REV 30	750-028467	ABBN0316	MPC-3D-16XGE-SFPP
FPC 3	REV 32	750-028467	ABBN6832	MPC-3D-16XGE-SFPP
FPC 4	REV 32	750-028467	ABBN6811	MPC-3D-16XGE-SFPP
FPC 5	REV 32	750-028467	ABBN6791	MPC-3D-16XGE-SFPP
FPC 6	REV 30	750-028467	ABBM4592	MPC-3D-16XGE-SFPP
FPC 7	REV 32	750-028467	ABBN6810	MPC-3D-16XGE-SFPP
FPC 8	REV 30	750-028467	ABBM4739	MPC-3D-16XGE-SFPP
FPC 9	REV 32	750-028467	ABBN6827	MPC-3D-16XGE-SFPP
FPC 10	REV 30	750-028467	ABBN0302	MPC-3D-16XGE-SFPP
FPC 11	REV 32	750-028467	ABBN6790	MPC-3D-16XGE-SFPP
FPC 12	REV 30	750-028467	ZM5111	MPC-3D-16XGE-SFPP
FPC 13	REV 30	750-028467	ABBN0208	MPC-3D-16XGE-SFPP

FPC 14	REV 23	750-028467	YN2977	MPC-3D-16XGE-SFPP
FPC 15	REV 32	750-028467	ABBN6798	MPC-3D-16XGE-SFPP
FPC 16	REV 30	750-028467	ABBN0270	MPC-3D-16XGE-SFPP
FPC 17	REV 32	750-028467	ABBN6796	MPC-3D-16XGE-SFPP
FPC 18	REV 30	750-028467	ABBN0281	MPC-3D-16XGE-SFPP
FPC 19	REV 32	750-028467	ABBN6813	MPC-3D-16XGE-SFPP
ADC 0	REV 13	750-043596	ABBX5561	PROTO-ASSEMBLY
ADC 1	REV 13	750-043596	ABBX5546	PROTO-ASSEMBLY
ADC 2	REV 13	750-043596	ABBX5535	MX2000-LC-ADAPTER
ADC 3	REV 13	750-043596	ABBX5552	MX2000-LC-ADAPTER
ADC 4	REV 13	750-043596	ABBX5581	MX2000-LC-ADAPTER
ADC 5	REV 13	750-043596	ABBX5545	PROTO-ASSEMBLY
ADC 6	REV 13	750-043596	ABBX5554	PROTO-ASSEMBLY
ADC 7	REV 07	750-043596	ABBV7194	MX2000-LC-ADAPTER
ADC 8	REV 07	750-043596	ABBV7251	MX2000-LC-ADAPTER
ADC 9	REV 07	750-043596	ABBV7202	MX2000-LC-ADAPTER
ADC 10	REV 13	750-043596	ABBX5579	MX2000-LC-ADAPTER
ADC 12	REV 13	750-043596	ABBX5575	MX2000-LC-ADAPTER
ADC 13	REV 13	750-043596	ABBX5539	PROTO-ASSEMBLY
ADC 14	REV 13	750-043596	ABBX5555	PROTO-ASSEMBLY
ADC 15	REV 13	750-043596	ABBX5557	MX2000-LC-ADAPTER
ADC 16	REV 13	750-043596	ABBX5536	PROTO-ASSEMBLY
ADC 17	REV 13	750-043596	ABBX5559	PROTO-ASSEMBLY
ADC 18	REV 13	750-043596	ABBX5537	PROTO-ASSEMBLY
ADC 19	REV 11	750-043596	ABBW5685	PROTO-ASSEMBLY
Fan Tray 0	REV 04	760-046960	ACAY0090	
Fan Tray 1	REV 04	760-046960	ACAY0088	
Fan Tray 2	REV 04	760-046960	ACAY0089	
Fan Tray 3	REV 04	760-046960	ACAY0108	

### show chassis hardware clei-models (MX2020 Router)

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user@ host > show chassis hardware clei-models
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Hardware inventory:

Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 27	750-040240	PROTOXCLEI	750-040240
FPM Board	REV 06	760-040242	PROTOXCLEI	760-040242
PSM 0	REV 01	740-045050	IPUPAJMKAA	MX2000-PSM-HC-DC-S-A
PSM 1	REV 01	740-045050	IPUPAJMKAA	MX2000-PSM-HC-DC-S-A
PSM 2	REV 01	740-045050	IPUPAJMKAA	MX2000-PSM-HC-DC-S-A
PSM 3	REV 01	740-045050	IPUPAJMKAA	MX2000-PSM-HC-DC-S-A
PSM 4	REV 01	740-045050	IPUPAJMKAA	MX2000-PSM-HC-DC-S-A
PSM 5	REV 01	740-045050	IPUPAJMKAA	MX2000-PSM-HC-DC-S-A
PSM 6	REV 01	740-045050	IPUPAJMKAA	MX2000-PSM-HC-DC-S-A
PSM 7	REV 01	740-045050	IPUPAJMKAA	MX2000-PSM-HC-DC-S-A
PSM 8	REV 01	740-045050	IPUPAJMKAA	MX2000-PSM-HC-DC-S-A
PSM 9	REV 03	740-045050	IPUPAJMKAA	MX2000-PSM-DC-S-A
PSM 10	REV 03	740-045050	IPUPAJMKAA	MX2000-PSM-DC-S-A
PSM 11	REV 03	740-045050	IPUPAJMKAA	MX2000-PSM-DC-S-A
PSM 12	REV 03	740-045050	IPUPAJMKAA	MX2000-PSM-DC-S-A
PSM 13	REV 03	740-045050	IPUPAJMKAA	MX2000-PSM-DC-S-A
PSM 15	REV 03	740-045050	IPUPAJMKAA	MX2000-PSM-DC-S-A
PDM 0	REV 01	740-045234		
PDM 1	REV 01	740-045234		
PDM 2	REV 01	740-045234	IPUPAJSKAA	MX2000-PDM-DC-S-A
Routing Engine 0	REV 02	740-041821		RE-S-1800X4-16G-S
Routing Engine 1	REV 02	740-041821		RE-S-1800X4-16G-S
CB 0	REV 08	750-040257	PROTOXCLEI	750-040257
CB 1	REV 04	750-040257	PROTOXCLEI	750-040257

SFB 0	REV 05	711-044466	IPUCBA6CAA	MX2000-SFB-S
SFB 1	REV 05	711-044466	IPUCBA6CAA	MX2000-SFB-S
SFB 2	REV 05	711-044466	IPUCBA6CAA	MX2000-SFB-S
SFB 4	REV 05	711-044466	IPUCBA6CAA	MX2000-SFB-S
SFB 5	REV 05	711-044466	IPUCBA6CAA	MX2000-SFB-S
SFB 7	REV 05	711-044466	IPUCBA6CAA	MX2000-SFB-S
FPC 0	REV 30	750-028467		MPC-3D-16XGE-SFPP
FPC 1	REV 30	750-028467		MPC-3D-16XGE-SFPP
FPC 2	REV 30	750-028467		MPC-3D-16XGE-SFPP
FPC 3	REV 32	750-028467		MPC-3D-16XGE-SFPP
FPC 4	REV 32	750-028467		MPC-3D-16XGE-SFPP
FPC 5	REV 32	750-028467		MPC-3D-16XGE-SFPP
FPC 6	REV 30	750-028467		MPC-3D-16XGE-SFPP
FPC 7	REV 32	750-028467		MPC-3D-16XGE-SFPP
FPC 8	REV 30	750-028467		MPC-3D-16XGE-SFPP
FPC 9	REV 32	750-028467		MPC-3D-16XGE-SFPP
FPC 10	REV 30	750-028467		MPC-3D-16XGE-SFPP
FPC 11	REV 32	750-028467		MPC-3D-16XGE-SFPP
FPC 12	REV 30	750-028467		MPC-3D-16XGE-SFPP
FPC 13	REV 30	750-028467		MPC-3D-16XGE-SFPP
FPC 14	REV 23	750-028467		MPC-3D-16XGE-SFPP
FPC 15	REV 32	750-028467		MPC-3D-16XGE-SFPP
FPC 16	REV 30	750-028467		MPC-3D-16XGE-SFPP
FPC 17	REV 32	750-028467		MPC-3D-16XGE-SFPP
FPC 18	REV 30	750-028467		MPC-3D-16XGE-SFPP
FPC 19	REV 32	750-028467		MPC-3D-16XGE-SFPP
ADC 0	REV 13	750-043596	PROTOXCLEI	PROTO-ASSEMBLY
ADC 1	REV 13	750-043596	PROTOXCLEI	PROTO-ASSEMBLY
ADC 2	REV 13	750-043596	IPUCBA8CAA	MX2000-LC-ADAPTER
ADC 3	REV 13	750-043596	IPUCBA8CAA	MX2000-LC-ADAPTER
ADC 4	REV 13	750-043596	IPUCBA8CAA	MX2000-LC-ADAPTER
ADC 5	REV 13	750-043596	PROTOXCLEI	PROTO-ASSEMBLY
ADC 6	REV 13	750-043596	PROTOXCLEI	PROTO-ASSEMBLY
ADC 7	REV 07	750-043596	PROTOXCLEI	MX2000-LC-ADAPTER
ADC 8	REV 07	750-043596	PROTOXCLEI	MX2000-LC-ADAPTER
ADC 9	REV 07	750-043596	PROTOXCLEI	MX2000-LC-ADAPTER
ADC 10	REV 13	750-043596	IPUCBA8CAA	MX2000-LC-ADAPTER
ADC 12	REV 13	750-043596	IPUCBA8CAA	MX2000-LC-ADAPTER
ADC 13	REV 13	750-043596	PROTOXCLEI	PROTO-ASSEMBLY
ADC 14	REV 13	750-043596	PROTOXCLEI	PROTO-ASSEMBLY
ADC 15	REV 13	750-043596	IPUCBA8CAA	MX2000-LC-ADAPTER
ADC 16	REV 13	750-043596	PROTOXCLEI	PROTO-ASSEMBLY
ADC 17	REV 13	750-043596	PROTOXCLEI	PROTO-ASSEMBLY
ADC 18	REV 13	750-043596	PROTOXCLEI	PROTO-ASSEMBLY
ADC 19	REV 11	750-043596	PROTOXCLEI	PROTO-ASSEMBLY
Fan Tray 0	REV 04	760-046960		
Fan Tray 1	REV 04	760-046960		
Fan Tray 2	REV 04	760-046960		
Fan Tray 3	REV 04	760-046960		

### show chassis hardware (MX2020 Router with MPC5EQ and MPC6E)

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user@host> show chassis hardware
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Hardware inventory:
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Item	Version	Part number	Serial number	Description
Chassis			JN120BADBAFJ	MX2020
Midplane	REV 51	750-040240	ABAB9243	Lower Backplane
Midplane 1	REV 04	711-032386	ABAB9399	Upper Backplane
PMP 1	REV 05	711-032428	ACAJ2541	Upper Power Midplane

PMP 0	REV 04	711-032426	ACAJ2194	Lower Power Midplane
FPM Board	REV 13	760-040242	ABCA8835	Front Panel Display
Module	REV 01	740-050037	1EDB32403L5	DC 52V Power Supply
PSM 1	REV 01	740-050037	1EDB32403L3	DC 52V Power Supply
Module				
PSM 2	REV 01	740-050037	1EDB32403KM	DC 52V Power Supply
Module				
PSM 3	REV 01	740-050037	1EDB3130079	DC 52V Power Supply
Module				
PSM 4	REV 01	740-050037	1EDB3130077	DC 52V Power Supply
Module				
PSM 5	REV 01	740-050037	1EDB3130020	DC 52V Power Supply
Module				
PSM 6	REV 01	740-050037	1EDB313009S	DC 52V Power Supply
Module				
PSM 7	REV 01	740-050037	1EDB313008E	DC 52V Power Supply
Module				
PSM 8	REV 01	740-050037	1EDB3130063	DC 52V Power Supply
Module				
PSM 12	REV 01	740-050037	1EDB3130026	DC 52V Power Supply
Module				
PSM 13	REV 01	740-050037	1EDB3130074	DC 52V Power Supply
Module				
PSM 14	REV 01	740-050037	1EDB313009D	DC 52V Power Supply
Module				
PSM 15	REV 01	740-050037	1EDB3130024	DC 52V Power Supply
Module				
PSM 16	REV 01	740-050037	1EDB3130054	DC 52V Power Supply
Module				
PSM 17	REV 01	740-050037	1EDB3130080	DC 52V Power Supply
Module				
PDM 0	REV 03	740-045234	1EGA3170144	DC Power Dist Module
PDM 1	REV 03	740-045234	1EGA3170158	DC Power Dist Module
PDM 2	REV 03	740-045234	1EGA3170182	DC Power Dist Module
PDM 3	REV 03	740-045234	1EGA3170207	DC Power Dist Module
Routing Engine 0	REV 02	740-041821	9009112112	RE-S-1800x4
Routing Engine 1	REV 02	740-041821	9009112087	RE-S-1800x4
CB 0	REV 23	750-040257	CABA2295	Control Board
CB 1	REV 23	750-040257	CABE8379	Control Board
SPMB 0	REV 02	711-041855	ABCE8851	PMB Board
SPMB 1	REV 02	711-041855	ABCE8839	PMB Board
SFB 0	REV 06	711-044466	ABCD5001	Switch Fabric Board
SFB 1	REV 06	711-044466	ABCD5034	Switch Fabric Board
SFB 2	REV 06	711-044466	ABCH3899	Switch Fabric Board
SFB 3	REV 06	711-044466	ABCD5020	Switch Fabric Board
SFB 4	REV 06	711-044466	ABCD4975	Switch Fabric Board
SFB 5	REV 06	711-044466	ABCH3881	Switch Fabric Board
SFB 6	REV 06	711-044466	ABCD5026	Switch Fabric Board
SFB 7	REV 06	711-044466	ABCD5032	Switch Fabric Board
FPC 0	REV 39	750-045715	CACD1902	MPC5E 3D Q 24XGE+6XLGE
CPU	REV 09	711-045719	CACB1933	RMPC PMB
PIC 0		BUILTIN	BUILTIN	12X10GE SFPP OTN
Xcvr 0	REV 01	740-031980	B11F00361	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	19T511101854	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	19T511100377	SFP+-10G-SR
Xcvr 4	REV 01	740-031980	ANT0878	SFP+-10G-SR
Xcvr 5	REV 01	740-021308	19T511100398	SFP+-10G-SR
Xcvr 6	REV 01	740-021308	AQ4363J	SFP+-10G-SR
Xcvr 7	REV 01	740-021308	19T511101377	SFP+-10G-SR

Xcvr 8	REV 01	740-031980	ANT072M	SFP+-10G-SR
Xcvr 9	REV 01	740-021308	AG90C7N	SFP+-10G-SR
Xcvr 10	REV 01	740-031980	AM30M09	SFP+-10G-SR
Xcvr 11	REV 01	740-031980	B10E01016	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	12X10GE SFPP OTN
Xcvr 0	REV 01	740-031980	B10L04151	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	19T511101379	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AQ5036J	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AG90C4M	SFP+-10G-SR
Xcvr 4	REV 01	740-021308	19T511101104	SFP+-10G-SR
Xcvr 5	REV 01	740-021308	AQ502ZM	SFP+-10G-SR
Xcvr 6	REV 01	740-021308	AN10KY2	SFP+-10G-SR
Xcvr 7	REV 01	740-021308	AQ43G41	SFP+-10G-SR
Xcvr 8	REV 01	740-021308	AQ41F04	SFP+-10G-SR
Xcvr 9	REV 01	740-031980	AMS16N3	SFP+-10G-SR
Xcvr 10	REV 01	740-021308	AMH04Y3	SFP+-10G-SR
Xcvr 11	REV 01	740-021308	ANA093E	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	3X40GE QSFPP
PIC 3		BUILTIN	BUILTIN	3X40GE QSFPP
WAN MEZZ	REV 09	750-049136	CABN0410	MPC5E 24XGE OTN Mezz
FPC 1	REV 11	750-045372	CABK8112	MPCE Type 3 3D
CPU	REV 08	711-035209	CABJ6621	HMPC PMB 2G
MIC 0	REV 07	750-033307	CAAZ2897	10X10GE SFPP
PIC 0		BUILTIN	BUILTIN	10X10GE SFPP
Xcvr 0	REV 01	740-021308	AQ501VK	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQ501YC	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AQ43HJF	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQ43H8D	SFP+-10G-SR
Xcvr 4	REV 01	740-021308	19T511100370	SFP+-10G-SR
Xcvr 5	REV 01	740-031980	153363A00763	SFP+-10G-SR
Xcvr 6	REV 01	740-021308	APH2LXB	SFP+-10G-SR
Xcvr 7	REV 01	740-031980	AMCOLVV	SFP+-10G-SR
Xcvr 8	REV 01	740-031980	B11F00230	SFP+-10G-SR
MIC 1	REV 14	750-033196	CAAP1390	1X100GE CXP
PIC 2		BUILTIN	BUILTIN	1X100GE CXP
Xcvr 0	REV 01	740-032166	XB11F000M	CFP2-100G-SR10
FPC 2	REV 17	750-037355	CAAS5826	MPC4E 3D 2CGE+8XGE
CPU	REV 08	711-035209	CAAR3986	HMPC PMB 2G
PIC 0		BUILTIN	BUILTIN	4x10GE SFPP
Xcvr 0	REV 01	740-021308	T09F43722	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	ALP0KXF	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AQ502FG	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQ502T7	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	1X100GE CFP
Xcvr 0	REV 01	740-035329	X12J00571	CFP-100G-SR10
PIC 2		BUILTIN	BUILTIN	4x10GE SFPP
Xcvr 0	REV 01	740-031980	AJ71KEH	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11E01355	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B11F00249	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	1X100GE CFP
FPC 3	REV 05	750-044444	CAAY9920	MPCE Type 2 3D P
CPU	REV 04	711-038484	CAAW3639	MPCE PMB 2G
MIC 0	REV 28	750-028387	CAAX1083	3D 4x 10GE XFP
PIC 0		BUILTIN	BUILTIN	2x 10GE XFP
Xcvr 0		NON-JNPR	CC07BK05B	XFP-10G-SR
Xcvr 1	REV 01	740-011571	C728XJ00U	XFP-10G-SR
PIC 1		BUILTIN	BUILTIN	2x 10GE XFP
Xcvr 0		NON-JNPR	T12L92339	XFP-10G-SR
QXM 0	REV 06	711-028408	CAAW4915	MPC QXM
QXM 1	REV 06	711-028408	CAAW4894	MPC QXM

FPC 4	REV 18	750-046005	CACH5661	MPC5E 3D Q 2CGE+4XGE
CPU	REV 09	711-045719	CACF2880	RMPC PMB
PIC 0		BUILTIN	BUILTIN	2X10GE SFPP OTN
PIC 1		BUILTIN	BUILTIN	1X100GE CFP2 OTN
Xcvr 0	REV 01	740-046563	XD16FC03Y	CFP2-100G-SR10
PIC 2		BUILTIN	BUILTIN	2X10GE SFPP OTN
PIC 3		BUILTIN	BUILTIN	1X100GE CFP2 OTN
Xcvr 0	REV 01	740-049775	J13K72997	CFP2-100G-LR4-D
FPC 5	REV 35	750-028467	CAAR2623	MPC 3D 16x 10GE
CPU	REV 11	711-029089	CAAR0491	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	AQ5027T	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQ502J0	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AQ5027S	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQ501Y7	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	AQ501YB	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQ503EB	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AQ43HJH	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQ43J0Y	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	AQ50352	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQ501X6	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AQ502NV	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQ502ZJ	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	AQ502H4	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQ43HJK	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AJ30CU7	SFP+-10G-SR
FPC 9	REV 30	750-044130	ABCF5773	MPC6E 3D
CPU	REV 09	711-045719	ABCF1270	RMPC PMB
MIC 0	REV 05	750-049457	ABCD7829	2X100GE CFP2 OTN
PIC 0		BUILTIN	BUILTIN	2X100GE CFP2 OTN
Xcvr 0		NON-JNPR	FE13F000K	CFP2-100G-SR10
Xcvr 1	REV 01	740-048813	XD32FE017	CFP2-100G-LR-D
MIC 1	REV 07	750-049457	ABCK2812	2X100GE CFP2 OTN
PIC 1		BUILTIN	BUILTIN	2X100GE CFP2 OTN
Xcvr 0	REV 01	740-048813	XD32FE018	CFP2-100G-SR10
Xcvr 1		NON-JNPR	FE13F000E	CFP2-100G-LR4-D
XLM 0	REV 05.2.00	711-046638	ABCF5915	MPC6E XL
XLM 1	REV 05.2.00	711-046638	ABCF5916	MPC6E XL
FPC 10	REV 36	750-044130	ABCS8602	MPC6E 3D
CPU	REV 09	711-045719	ABCS8779	RMPC PMB
MIC 0	REV 06	750-049979	ABCK2656	24X10GE SFPP OTN
PIC 0		BUILTIN	BUILTIN	24X10GE SFPP OTN
Xcvr 0	REV 01	740-021308	AQ43J08	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQE1Y2E	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AQE1UW4	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQE1MQF	SFP+-10G-SR
Xcvr 4	REV 01	740-021308	AQGOMN1	SFP+-10G-SR
Xcvr 5	REV 01	740-021308	AQE1L9M	SFP+-10G-SR
Xcvr 6	REV 01	740-021308	AQGOMPD	SFP+-10G-SR
Xcvr 7	REV 01	740-021308	AQE1Y2B	SFP+-10G-SR
Xcvr 8	REV 01	740-021308	AQGOLT5	SFP+-10G-SR
Xcvr 9	REV 01	740-021308	AQD2ET4	SFP+-10G-SR
Xcvr 10	REV 01	740-021308	AQGOMPC	SFP+-10G-SR
Xcvr 11	REV 01	740-021308	AQGOM63	SFP+-10G-SR
Xcvr 12	REV 01	740-021308	AQGOLT1	SFP+-10G-SR
Xcvr 13	REV 01	740-021308	AQGOM4L	SFP+-10G-SR
Xcvr 14	REV 01	740-021308	AQGOLS7	SFP+-10G-SR

Xcvr 15	REV 01	740-021308	AQE1MQB	SFP+-10G-SR
Xcvr 16	REV 01	740-021308	AQGOLZP	SFP+-10G-SR
Xcvr 17	REV 01	740-021308	AQE1LU9	SFP+-10G-SR
Xcvr 18	REV 01	740-021308	AQGOMRZ	SFP+-10G-SR
Xcvr 19	REV 01	740-021308	AQE1MQ9	SFP+-10G-SR
Xcvr 20	REV 01	740-021308	AQGOLRX	SFP+-10G-SR
Xcvr 21	REV 01	740-021308	AQE1UWD	SFP+-10G-SR
Xcvr 22	REV 01	740-021308	AQGOLT4	SFP+-10G-SR
Xcvr 23	REV 01	740-021308	AQE1MQL	SFP+-10G-SR
MIC 1	REV 12	750-050008	ABCK5372	4X100GE CXP
PIC 1		BUILTIN	BUILTIN	4X100GE CXP
Xcvr 3	REV 01	740-046563	XD16FC02Z	CFP2-100G-SR10
XLM 0	REV 07.2.00	711-046638	ABCK3481	MPC6E XL
XLM 1	REV 07.2.00	711-046638	ABCK4725	MPC6E XL
FPC 17	REV 28	750-044130	ABBZ3873	MPC6E 3D
CPU	REV 08	711-045719	ABBZ3770	RMPC PMB
MIC 0	REV 11	750-046535	ABCC7731	24X10GE SFPP
PIC 0		BUILTIN	BUILTIN	24X10GE SFPP
Xcvr 1	REV 01	740-021308	APK0543	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B10G01119	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQ502SX	SFP+-10G-SR
Xcvr 4	REV 01	740-021308	AQ43H84	SFP+-10G-SR
Xcvr 5	REV 01	740-021308	AQ501TB	SFP+-10G-SR
Xcvr 6	REV 01	740-021308	AQ502JZ	SFP+-10G-SR
Xcvr 7	REV 01	740-021308	AQ502SC	SFP+-10G-SR
Xcvr 8	REV 01	740-021308	AQ502JW	SFP+-10G-SR
Xcvr 9	REV 01	740-021308	AQ502RM	SFP+-10G-SR
Xcvr 10	REV 01	740-031980	AHK013B	SFP+-10G-SR
Xcvr 11	REV 01	740-021308	AQGOMRT	SFP+-10G-SR
Xcvr 13	REV 01	740-031980	AMC0JTC	SFP+-10G-SR
Xcvr 14	REV 01	740-021308	ANAOHQ0	SFP+-10G-SR
Xcvr 15	REV 01	740-021308	AQ502GS	SFP+-10G-SR
Xcvr 16	REV 01	740-021308	AQGOM0J	SFP+-10G-SR
Xcvr 17	REV 01	740-021308	AQGOMUR	SFP+-10G-SR
Xcvr 18	REV 01	740-021308	AQGOMRR	SFP+-10G-SR
Xcvr 19	REV 01	740-021308	AQGOM0F	SFP+-10G-SR
Xcvr 20	REV 01	740-021308	AQ50312	SFP+-10G-SR
Xcvr 21	REV 01	740-021308	AQ5032U	SFP+-10G-SR
Xcvr 22	REV 01	740-021308	APE17B5	SFP+-10G-SR
Xcvr 23	REV 01	740-021309	91D104A00011	SFP+-10G-LR
MIC 1	REV 03	750-050008	ABCC4522	4X100GE CXP
PIC 1		BUILTIN	BUILTIN	4X100GE CXP
Xcvr 0	REV 01	740-046563	XD16FC02U	CFP2-100G-SR10
Xcvr 1	REV 01	740-046563	XC42FC03K	CFP2-100G-SR10
Xcvr 2	REV 01	740-046563	XC42FC01Z	CFP2-100G-SR10
Xcvr 3	REV 01	740-046563	XC42FC02U	CFP2-100G-SR10
XLM 0	REV 04.2.00	711-046638	ABBZ3779	MPC6E XL
XLM 1	REV 04.2.00	711-046638	ABBZ3780	MPC6E XL
FPC 18	REV 39	750-045715	CACD1910	MPC5E 3D Q 24XGE+6XLGE
CPU	REV 09	711-045719	CACD1817	RMPC PMB
PIC 0		BUILTIN	BUILTIN	12X10GE SFPP OTN
PIC 1		BUILTIN	BUILTIN	12X10GE SFPP OTN
PIC 2		BUILTIN	BUILTIN	3X40GE QSFPP
Xcvr 0	REV 01	740-046565	QD130194	QSFP+-40G-SR4
Xcvr 1	REV 01	740-046565	QD130193	QSFP+-40G-SR4
Xcvr 2	REV 01	740-046565	QD130196	QSFP+-40G-SR4
PIC 3		BUILTIN	BUILTIN	3X40GE QSFPP
Xcvr 0	REV 01	740-046565	QD130191	QSFP+-40G-SR4
Xcvr 1	REV 01	740-046565	QD130198	QSFP+-40G-SR4
Xcvr 2	REV 01	740-046565	QD130192	QSFP+-40G-SR4

WAN MEZZ	REV 09	750-049136	CABN0411	MPC5E 24XGE OTN Mezz
FPC 19	REV 39	750-045715	CACD1908	MPC5E 3D Q 24XGE+6XLGE
CPU	REV 09	711-045719	CACD1820	RMPC PMB
PIC 0		BUILTIN	BUILTIN	12X10GE SFPP OTN
Xcvr 0	REV 01	740-021308	AQA0EXJ	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQG0M6D	SFP+-10G-SR
Xcvr 2	REV 01	740-021308	AQG0LW7	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	AQA0JKB	SFP+-10G-SR
Xcvr 4	REV 01	740-021308	AQG0MTM	SFP+-10G-SR
Xcvr 5	REV 01	740-021308	AQA07NE	SFP+-10G-SR
Xcvr 6	REV 01	740-021308	AQG0M41	SFP+-10G-SR
Xcvr 7	REV 01	740-021308	AQG0MU7	SFP+-10G-SR
Xcvr 8	REV 01	740-021308	AQG0MUG	SFP+-10G-SR
Xcvr 9	REV 01	740-021308	AQG0MMX	SFP+-10G-SR
Xcvr 10	REV 01	740-021308	AQG0M5K	SFP+-10G-SR
Xcvr 11	REV 01	740-021308	AQG0LVZ	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	12X10GE SFPP OTN
PIC 2		BUILTIN	BUILTIN	3X40GE QSFP
PIC 3		BUILTIN	BUILTIN	3X40GE QSFP
Xcvr 0	REV 01	740-046565	QD130242	QSFP+-40G-SR4
Xcvr 1	REV 01	740-046565	QD130245	QSFP+-40G-SR4
Xcvr 2	REV 01	740-046565	QD130613	QSFP+-40G-SR4
WAN MEZZ	REV 09	750-049136	CABN0418	MPC5E 24XGE OTN Mezz
ADC 0	REV 17	750-043596	ABCD5378	Adapter Card
ADC 1	REV 17	750-043596	ABCD5465	Adapter Card
ADC 2	REV 17	750-043596	ABCD5431	Adapter Card
ADC 3	REV 17	750-043596	ABCD5356	Adapter Card
ADC 4	REV 02	750-043596	ZW1545	Adapter Card
ADC 5	REV 17	750-043596	ABCD5517	Adapter Card
ADC 18	REV 17	750-043596	ABCD5535	Adapter Card
ADC 19	REV 01	750-043596	ZV4127	Adapter Card
Fan Tray 0	REV 06	760-046960	ACAY0791	172mm FanTray - 6 Fans
Fan Tray 1	REV 06	760-046960	ACAY0788	172mm FanTray - 6 Fans
Fan Tray 2	REV 06	760-046960	ACAY0755	172mm FanTray - 6 Fans
Fan Tray 3	REV 06	760-046960	ACAY0441	172mm FanTray - 6 Fans

## show chassis hardware detail (MX2020 Router with MPC5EQ and MPC6E)

user@host&gt;show chassis hardware detail

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN120BADBAFJ	MX2020
Midplane	REV 51	750-040240	ABAB9243	Lower Backplane
Midplane 1	REV 04	711-032386	ABAB9399	Upper Backplane
PMP 1	REV 05	711-032428	ACAJ2541	Upper Power Midplane
PMP 0	REV 04	711-032426	ACAJ2194	Lower Power Midplane
FPM Board	REV 13	760-040242	ABCA8835	Front Panel Display
PSM 0	REV 01	740-050037	1EDB32403L5	DC 52V Power Supply
Module				
PSM 1	REV 01	740-050037	1EDB32403L3	DC 52V Power Supply
Module				
PSM 2	REV 01	740-050037	1EDB32403KM	DC 52V Power Supply
Module				
PSM 3	REV 01	740-050037	1EDB3130079	DC 52V Power Supply
Module				
PSM 4	REV 01	740-050037	1EDB3130077	DC 52V Power Supply
Module				
PSM 5	REV 01	740-050037	1EDB3130020	DC 52V Power Supply
Module				



PSM 6 Module	REV 01	740-050037	1EDB313009S	DC 52V Power Supply
PSM 7 Module	REV 01	740-050037	1EDB313008E	DC 52V Power Supply
PSM 8 Module	REV 01	740-050037	1EDB3130063	DC 52V Power Supply
PSM 12 Module	REV 01	740-050037	1EDB3130026	DC 52V Power Supply
PSM 13 Module	REV 01	740-050037	1EDB3130074	DC 52V Power Supply
PSM 14 Module	REV 01	740-050037	1EDB313009D	DC 52V Power Supply
PSM 15 Module	REV 01	740-050037	1EDB3130024	DC 52V Power Supply
PSM 16 Module	REV 01	740-050037	1EDB3130054	DC 52V Power Supply
PSM 17 Module	REV 01	740-050037	1EDB3130080	DC 52V Power Supply
PDM 0	REV 03	740-045234	1EGA3170144	DC Power Dist Module
PDM 1	REV 03	740-045234	1EGA3170158	DC Power Dist Module
PDM 2	REV 03	740-045234	1EGA3170182	DC Power Dist Module
PDM 3	REV 03	740-045234	1EGA3170207	DC Power Dist Module
Routing Engine 0	REV 02	740-041821	9009112112	RE-S-1800x4
ad0 3998 MB	Virtium - TuffDrive		VCF P1T0200274310822	113 Compact Flash
ad1 30533 MB	UGB94BPH32H0S1-KCI		11000031656	Disk 1
usb0 (addr 1)	EHCI root hub 0		Intel	uhub0
usb0 (addr 2)	product 0x0020 32		vendor 0x8087	uhub1
DIMM 0	SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80			
DIMM 1	SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80			
DIMM 2	SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80			
DIMM 3	SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80			
Routing Engine 1	REV 02	740-041821	9009112087	RE-S-1800x4
ad0 3998 MB	Virtium - TuffDrive		VCF P1T0200274310822	366 Compact Flash
ad1 30533 MB	UGB94BPH32H0S1-KCI		11000039979	Disk 1
CB 0	REV 23	750-040257	CABA2295	Control Board
CB 1	REV 23	750-040257	CABE8379	Control Board
SPMB 0				
SPMB 1				
FPC 0 CPU	REV 39	750-045715	CACD1902	MPC5E 3D Q 24XGE+6XLGE
FPC 1 CPU	REV 11	750-045372	CABK8112	MPCE Type 3 3D
FPC 2 CPU	REV 17	750-037355	CAAS5826	MPC4E 3D 2CGE+8XGE
FPC 3 CPU	REV 05	750-044444	CAAY9920	MPCE Type 2 3D P
FPC 4 CPU	REV 18	750-046005	CACH5661	MPC5E 3D Q 2CGE+4XGE
FPC 5 CPU	REV 35	750-028467	CAAR2623	MPC 3D 16x 10GE
FPC 9 CPU	REV 30	750-044130	ABCF5773	MPC6E 3D
FPC 10 CPU	REV 36	750-044130	ABCS8602	MPC6E 3D
FPC 17 CPU	REV 28	750-044130	ABBZ3873	MPC6E 3D
FPC 18 CPU	REV 39	750-045715	CACD1910	MPC5E 3D Q 24XGE+6XLGE
FPC 19 CPU	REV 39	750-045715	CACD1908	MPC5E 3D Q 24XGE+6XLGE

Fan Tray 0	REV 06	760-046960	ACAY0791	172mm FanTray - 6 Fans
Fan Tray 1	REV 06	760-046960	ACAY0788	172mm FanTray - 6 Fans
Fan Tray 2	REV 06	760-046960	ACAY0755	172mm FanTray - 6 Fans
Fan Tray 3	REV 06	760-046960	ACAY0441	172mm FanTray - 6 Fans

### show chassis hardware extensive (MX2020 Router with MPC5EQ and MPC6E)

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user@host> show chassis hardware extensive
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#### Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN120BADBAFJ	MX2020
Jedec Code:	0x7fb0		EEPROM Version:	0x02
			S/N:	JN120BADBAFJ
Assembly ID:	0x0557		Assembly Version:	00.00
Date:	00-00-0000		Assembly Flags:	0x00
ID:	MX2020			
Board Information Record:				
Address 0x00:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00			
I2C Hex Data:				
Address 0x00:	7f b0 02 ff 05 57 00 00 00 00 00 00 00 00 00 00			
Address 0x10:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00			
Address 0x20:	4a 4e 31 32 30 42 41 44 42 41 46 4a 00 00 00 00			
Address 0x30:	00 00 00 ff 00 00 00 00 00 00 00 00 00 00 00 00			
Address 0x40:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00			
Address 0x50:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00			
Address 0x60:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00			
Address 0x70:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00			
Midplane	REV 51	750-040240	ABAB9243	Lower Backplane
Jedec Code:	0x7fb0		EEPROM Version:	0x02
P/N:	750-040240		S/N:	ABAB9243
Assembly ID:	0x0b22		Assembly Version:	01.51
Date:	05-30-2013		Assembly Flags:	0x00
Version:	REV 51		CLEI Code:	IPMU710ARA
ID:	Lower Backplane		FRU Model Number:	CHAS-BP-MX2020-S
Board Information Record:				
Address 0x00:	ad 01 10 00 4c 96 14 72 30 08 ff ff ff ff ff ff			
I2C Hex Data:				
Address 0x00:	7f b0 02 ff 0b 22 01 33 52 45 56 20 35 31 00 00			
Address 0x10:	00 00 00 00 37 35 30 2d 30 34 30 32 34 30 00 00			
Address 0x20:	53 2f 4e 20 41 42 41 42 39 32 34 33 00 1e 05 07			
Address 0x30:	dd ff ff ff ad 01 10 00 4c 96 14 72 30 08 ff ff			
Address 0x40:	ff ff ff ff 01 49 50 4d 55 37 31 30 41 52 41 43			
Address 0x50:	48 41 53 2d 42 50 2d 4d 58 32 30 32 30 2d 53 00			
Address 0x60:	00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff			
Address 0x70:	ff ff ff d3 ff ff ff ff ff ff ff ff ff ff ff			
Midplane 1	REV 04	711-032386	ABAB9399	Upper Backplane
Jedec Code:	0x7fb0		EEPROM Version:	0x01
P/N:	711-032386		S/N:	ABAB9399
Assembly ID:	0x0b23		Assembly Version:	01.04
Date:	10-22-2012		Assembly Flags:	0x00
Version:	REV 04			
ID:	Upper Backplane			
Board Information Record:				
Address 0x00:	ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff			
I2C Hex Data:				
Address 0x00:	7f b0 01 fe 0b 23 01 04 52 45 56 20 30 34 00 00			
Address 0x10:	00 00 00 00 37 31 31 2d 30 33 32 33 38 36 00 00			
Address 0x20:	53 2f 4e 20 41 42 41 42 39 33 39 39 00 16 0a 07			
Address 0x30:	dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff			

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Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff
Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
PMP 1          REV 05   711-032428   ACAJ2541          Upper Power Midplane
Jedec Code:    0x7fb0          EEPROM Version:    0x01
P/N:           711-032428      S/N:           ACAJ2541
Assembly ID:   0x045c          Assembly Version: 01.05
Date:          04-26-2013      Assembly Flags:  0x00
Version:       REV 05
ID: Upper Power Midplane
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 5c 01 05 52 45 56 20 30 35 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 33 32 34 32 38 00 00
  Address 0x20: 53 2f 4e 20 41 43 41 4a 32 35 34 31 00 1a 04 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff
  Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
PMP 0          REV 04   711-032426   ACAJ2194          Lower Power Midplane
Jedec Code:    0x7fb0          EEPROM Version:    0x01
P/N:           711-032426      S/N:           ACAJ2194
Assembly ID:   0x045d          Assembly Version: 01.04
Date:          01-29-2013      Assembly Flags:  0x00
Version:       REV 04
ID: Lower Power Midplane
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 5d 01 04 52 45 56 20 30 34 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 33 32 34 32 36 00 00
  Address 0x20: 53 2f 4e 20 41 43 41 4a 32 31 39 34 00 1d 01 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff
  Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM Board      REV 13   760-040242   ABCA8835          Front Panel Display
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           760-040242      S/N:           ABCA8835
Assembly ID:   0x0b24          Assembly Version: 01.13
Date:          04-13-2013      Assembly Flags:  0x00
Version:       REV 13          CLEI Code:       IPMYAE5JRA
ID: Front Panel Display      FRU Model Number: MX2020-CRAFT-S
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 24 01 0d 52 45 56 20 31 33 00 00
  Address 0x10: 00 00 00 00 37 36 30 2d 30 34 30 32 34 32 00 00
  Address 0x20: 53 2f 4e 20 41 42 43 41 38 38 33 35 00 0d 04 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 4d 59 41 45 35 4a 52 41 4d
  Address 0x50: 58 32 30 32 30 2d 43 52 41 46 54 2d 53 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff
  Address 0x70: ff ff ff 95 ff ff ff ff ff ff ff ff ff ff ff
PSM 0          REV 01   740-050037   1EDB32403L5      DC 52V Power Supply
Module

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Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N: 740-050037        S/N: 1EDB32403L5
Assembly ID: 0x0478     Assembly Version: 01.01
Date: 06-21-2013       Assembly Flags: 0x00
Version: REV 01        CLEI Code: IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 34 30 33 4c 35 00 00 15 06 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 1          REV 01 740-050037 1EDB32403L3 DC 52V Power Supply
Module
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N: 740-050037        S/N: 1EDB32403L3
Assembly ID: 0x0478     Assembly Version: 01.01
Date: 06-21-2013       Assembly Flags: 0x00
Version: REV 01        CLEI Code: IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 34 30 33 4c 33 00 00 15 06 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 2          REV 01 740-050037 1EDB32403KM DC 52V Power Supply
Module
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N: 740-050037        S/N: 1EDB32403KM
Assembly ID: 0x0478     Assembly Version: 01.01
Date: 06-21-2013       Assembly Flags: 0x00
Version: REV 01        CLEI Code: IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 32 34 30 33 4b 4d 00 00 15 06 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 3          REV 01 740-050037 1EDB3130079 DC 52V Power Supply
Module
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N: 740-050037        S/N: 1EDB3130079
Assembly ID: 0x0478     Assembly Version: 01.01

```

```

Date:          05-16-2013      Assembly Flags:  0x00
Version:       REV 01         CLEI Code:       IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number:  MX2000-PSM-DC-S
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 31 33 30 30 37 39 00 00 10 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 4          REV 01    740-050037    1EDB3130077    DC 52V Power Supply
Module
Jedec Code:    0x7fb0          EEPROM Version:  0x02
P/N:          740-050037      S/N:            1EDB3130077
Assembly ID:   0x0478         Assembly Version: 01.01
Date:         05-17-2013      Assembly Flags:  0x00
Version:       REV 01         CLEI Code:       IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number:  MX2000-PSM-DC-S
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 31 33 30 30 37 37 00 00 11 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 5          REV 01    740-050037    1EDB3130020    DC 52V Power Supply
Module
Jedec Code:    0x7fb0          EEPROM Version:  0x02
P/N:          740-050037      S/N:            1EDB3130020
Assembly ID:   0x0478         Assembly Version: 01.01
Date:         05-16-2013      Assembly Flags:  0x00
Version:       REV 01         CLEI Code:       IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number:  MX2000-PSM-DC-S
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 33 31 33 30 30 32 30 00 00 10 05 07
  Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 6          REV 01    740-050037    1EDB313009S    DC 52V Power Supply
Module
Jedec Code:    0x7fb0          EEPROM Version:  0x02
P/N:          740-050037      S/N:            1EDB313009S
Assembly ID:   0x0478         Assembly Version: 01.01
Date:         05-17-2013      Assembly Flags:  0x00
Version:       REV 01         CLEI Code:       IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number:  MX2000-PSM-DC-S

```

## Board Information Record:

Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff

## I2C Hex Data:

Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00  
 Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00  
 Address 0x20: 31 45 44 42 33 31 33 30 30 39 53 00 00 11 05 07  
 Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff  
 Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d  
 Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00  
 Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff  
 Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00

PSM 7                    REV 01    740-050037    1EDB313008E            DC 52V Power Supply  
 Module

Jedec Code:    0x7fb0                    EEPROM Version:    0x02  
 P/N:            740-050037                    S/N:                1EDB313008E  
 Assembly ID:   0x0478                    Assembly Version:   01.01  
 Date:           05-17-2013                    Assembly Flags:    0x00  
 Version:        REV 01                    CLEI Code:         IPUPAKRKAA  
 ID: DC 52V Power Supply Module    FRU Model Number: MX2000-PSM-DC-S

## Board Information Record:

Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff

## I2C Hex Data:

Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00  
 Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00  
 Address 0x20: 31 45 44 42 33 31 33 30 30 38 45 00 00 11 05 07  
 Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff  
 Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d  
 Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00  
 Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff  
 Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00

PSM 8                    REV 01    740-050037    1EDB3130063            DC 52V Power Supply  
 Module

Jedec Code:    0x7fb0                    EEPROM Version:    0x02  
 P/N:            740-050037                    S/N:                1EDB3130063  
 Assembly ID:   0x0478                    Assembly Version:   01.01  
 Date:           05-17-2013                    Assembly Flags:    0x00  
 Version:        REV 01                    CLEI Code:         IPUPAKRKAA  
 ID: DC 52V Power Supply Module    FRU Model Number: MX2000-PSM-DC-S

## Board Information Record:

Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff

## I2C Hex Data:

Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00  
 Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00  
 Address 0x20: 31 45 44 42 33 31 33 30 30 36 33 00 00 11 05 07  
 Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff  
 Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d  
 Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00  
 Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff  
 Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00

PSM 12                    REV 01    740-050037    1EDB3130026            DC 52V Power Supply  
 Module

Jedec Code:    0x7fb0                    EEPROM Version:    0x02  
 P/N:            740-050037                    S/N:                1EDB3130026  
 Assembly ID:   0x0478                    Assembly Version:   01.01  
 Date:           05-16-2013                    Assembly Flags:    0x00  
 Version:        REV 01                    CLEI Code:         IPUPAKRKAA  
 ID: DC 52V Power Supply Module    FRU Model Number: MX2000-PSM-DC-S

## Board Information Record:

Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff

## I2C Hex Data:

```

Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 31 33 30 30 32 36 00 00 10 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 13          REV 01   740-050037   1EDB3130074          DC 52V Power Supply
Module
Jedec Code:    0x7fb0          EEPROM Version:  0x02
P/N:           740-050037      S/N:             1EDB3130074
Assembly ID:   0x0478          Assembly Version: 01.01
Date:          05-17-2013      Assembly Flags:   0x00
Version:       REV 01          CLEI Code:        IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 31 33 30 30 37 34 00 00 11 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 14          REV 01   740-050037   1EDB313009D          DC 52V Power Supply
Module
Jedec Code:    0x7fb0          EEPROM Version:  0x02
P/N:           740-050037      S/N:             1EDB313009D
Assembly ID:   0x0478          Assembly Version: 01.01
Date:          05-17-2013      Assembly Flags:   0x00
Version:       REV 01          CLEI Code:        IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 33 31 33 30 30 39 44 00 00 11 05 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4b 52 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 2a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 15          REV 01   740-050037   1EDB3130024          DC 52V Power Supply
Module
Jedec Code:    0x7fb0          EEPROM Version:  0x02
P/N:           740-050037      S/N:             1EDB3130024
Assembly ID:   0x0478          Assembly Version: 01.01
Date:          05-16-2013      Assembly Flags:   0x00
Version:       REV 01          CLEI Code:        IPUPAKRKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
...
```

## show chassis hardware models (MX2020 Routers with MPC5EQ and MPC6E)

user@host&gt; show chassis hardware models

Hardware inventory:

Item	Version	Part number	Serial number	FRU model number
Midplane	REV 51	750-040240	ABAB9243	CHAS-BP-MX2020-S
FPM Board	REV 13	760-040242	ABCA8835	MX2020-CRAFT-S
PSM 0	REV 01	740-050037	1EDB32403L5	MX2000-PSM-DC-S
PSM 1	REV 01	740-050037	1EDB32403L3	MX2000-PSM-DC-S
PSM 2	REV 01	740-050037	1EDB32403KM	MX2000-PSM-DC-S
PSM 3	REV 01	740-050037	1EDB3130079	MX2000-PSM-DC-S
PSM 4	REV 01	740-050037	1EDB3130077	MX2000-PSM-DC-S
PSM 5	REV 01	740-050037	1EDB3130020	MX2000-PSM-DC-S
PSM 6	REV 01	740-050037	1EDB313009S	MX2000-PSM-DC-S
PSM 7	REV 01	740-050037	1EDB313008E	MX2000-PSM-DC-S
PSM 8	REV 01	740-050037	1EDB3130063	MX2000-PSM-DC-S
PSM 12	REV 01	740-050037	1EDB3130026	MX2000-PSM-DC-S
PSM 13	REV 01	740-050037	1EDB3130074	MX2000-PSM-DC-S
PSM 14	REV 01	740-050037	1EDB313009D	MX2000-PSM-DC-S
PSM 15	REV 01	740-050037	1EDB3130024	MX2000-PSM-DC-S
PSM 16	REV 01	740-050037	1EDB3130054	MX2000-PSM-DC-S
PSM 17	REV 01	740-050037	1EDB3130080	MX2000-PSM-DC-S
PDM 0	REV 03	740-045234	1EGA3170144	MX2000-PDM-DC-S
PDM 1	REV 03	740-045234	1EGA3170158	MX2000-PDM-DC-S
PDM 2	REV 03	740-045234	1EGA3170182	MX2000-PDM-DC-S
PDM 3	REV 03	740-045234	1EGA3170207	MX2000-PDM-DC-S
Routing Engine 0	REV 02	740-041821	9009112112	RE-MX2000-1800X4-S
Routing Engine 1	REV 02	740-041821	9009112087	RE-MX2000-1800X4-S
CB 0	REV 23	750-040257	CABA2295	RE-MX2000-1800X4-S
CB 1	REV 23	750-040257	CABE8379	RE-MX2000-1800X4-S
SFB 0	REV 06	711-044466	ABCD5001	MX2000-SFB-S
SFB 1	REV 06	711-044466	ABCD5034	MX2000-SFB-S
SFB 2	REV 06	711-044466	ABCH3899	MX2000-SFB-S
SFB 3	REV 06	711-044466	ABCD5020	MX2000-SFB-S
SFB 4	REV 06	711-044466	ABCD4975	MX2000-SFB-S
SFB 5	REV 06	711-044466	ABCH3881	MX2000-SFB-S
SFB 6	REV 06	711-044466	ABCD5026	MX2000-SFB-S
SFB 7	REV 06	711-044466	ABCD5032	MX2000-SFB-S
FPC 0	REV 39	750-045715	CACD1902	PROTO-ASSEMBLY
FPC 1	REV 11	750-045372	CABK8112	MX-MPC3E-3D
FPC 2	REV 17	750-037355	CAAS5826	MPC4E-3D-2CGE-8XGE
FPC 3	REV 05	750-044444	CAAY9920	MX-MPC2E-3D-P
FPC 4	REV 18	750-046005	CACH5661	PROTO-ASSEMBLY
FPC 5	REV 35	750-028467	CAAR2623	MPC-3D-16XGE-SFPP
FPC 9	REV 30	750-044130	ABCF5773	PROTO-ASSEMBLY
FPC 10	REV 36	750-044130	ABCS8602	PROTO-ASSEMBLY
FPC 17	REV 28	750-044130	ABBZ3873	PROTO-ASSEMBLY
FPC 18	REV 39	750-045715	CACD1910	PROTO-ASSEMBLY
FPC 19	REV 39	750-045715	CACD1908	PROTO-ASSEMBLY
ADC 0	REV 17	750-043596	ABCD5378	MX2000-LC-ADAPTER
ADC 1	REV 17	750-043596	ABCD5465	MX2000-LC-ADAPTER
ADC 2	REV 17	750-043596	ABCD5431	MX2000-LC-ADAPTER
ADC 3	REV 17	750-043596	ABCD5356	MX2000-LC-ADAPTER
ADC 4	REV 02	750-043596	ZW1545	750-043596
ADC 5	REV 17	750-043596	ABCD5517	MX2000-LC-ADAPTER
ADC 18	REV 17	750-043596	ABCD5535	MX2000-LC-ADAPTER
ADC 19	REV 01	750-043596	ZV4127	750-043596
Fan Tray 0	REV 06	760-046960	ACAY0791	MX2000-FANTRAY-S
Fan Tray 1	REV 06	760-046960	ACAY0788	MX2000-FANTRAY-S



Fan Tray 2	REV 06	760-046960	ACAY0755	MX2000-FANTRAY-S
Fan Tray 3	REV 06	760-046960	ACAY0441	MX2000-FANTRAY-S

### show chassis hardware clei-models (MX2020 Router with MPC5EQ and MPC6E)

```
user@host> show chassis hardware clei-models
```

Hardware inventory:

Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 51	750-040240	IPMU710ARA	CHAS-BP-MX2020-S
FPM Board	REV 13	760-040242	IPMYAE5JRA	MX2020-CRAFT-S
PSM 0	REV 01	740-050037	IPUPAKRKAA	MX2000-PSM-DC-S
PSM 1	REV 01	740-050037	IPUPAKRKAA	MX2000-PSM-DC-S
PSM 2	REV 01	740-050037	IPUPAKRKAA	MX2000-PSM-DC-S
PSM 3	REV 01	740-050037	IPUPAKRKAA	MX2000-PSM-DC-S
PSM 4	REV 01	740-050037	IPUPAKRKAA	MX2000-PSM-DC-S
PSM 5	REV 01	740-050037	IPUPAKRKAA	MX2000-PSM-DC-S
PSM 6	REV 01	740-050037	IPUPAKRKAA	MX2000-PSM-DC-S
PSM 7	REV 01	740-050037	IPUPAKRKAA	MX2000-PSM-DC-S
PSM 8	REV 01	740-050037	IPUPAKRKAA	MX2000-PSM-DC-S
PSM 12	REV 01	740-050037	IPUPAKRKAA	MX2000-PSM-DC-S
PSM 13	REV 01	740-050037	IPUPAKRKAA	MX2000-PSM-DC-S
PSM 14	REV 01	740-050037	IPUPAKRKAA	MX2000-PSM-DC-S
PSM 15	REV 01	740-050037	IPUPAKRKAA	MX2000-PSM-DC-S
PSM 16	REV 01	740-050037	IPUPAKRKAA	MX2000-PSM-DC-S
PSM 17	REV 01	740-050037	IPUPAKRKAA	MX2000-PSM-DC-S
PDM 0	REV 03	740-045234	IPUPAJSKAA	MX2000-PDM-DC-S
PDM 1	REV 03	740-045234	IPUPAJSKAA	MX2000-PDM-DC-S
PDM 2	REV 03	740-045234	IPUPAJSKAA	MX2000-PDM-DC-S
PDM 3	REV 03	740-045234	IPUPAJSKAA	MX2000-PDM-DC-S
CB 0	REV 23	750-040257	IPUCBA7CTA	RE-MX2000-1800X4-S
CB 1	REV 23	750-040257	IPUCBA7CTA	RE-MX2000-1800X4-S
SFB 0	REV 06	711-044466	IPUCBA6CAA	MX2000-SFB-S
SFB 1	REV 06	711-044466	IPUCBA6CAA	MX2000-SFB-S
SFB 2	REV 06	711-044466	IPUCBA6CAA	MX2000-SFB-S
SFB 3	REV 06	711-044466	IPUCBA6CAA	MX2000-SFB-S
SFB 4	REV 06	711-044466	IPUCBA6CAA	MX2000-SFB-S
SFB 5	REV 06	711-044466	IPUCBA6CAA	MX2000-SFB-S
SFB 6	REV 06	711-044466	IPUCBA6CAA	MX2000-SFB-S
SFB 7	REV 06	711-044466	IPUCBA6CAA	MX2000-SFB-S
FPC 0	REV 39	750-045715	PROTOXCLEI	PROTO-ASSEMBLY
FPC 1	REV 11	750-045372	COUIBBNBAA	MX-MPC3E-3D
FPC 2	REV 17	750-037355	IPU3A4DHAA	MPC4E-3D-2CGE-8XGE
FPC 3	REV 05	750-044444	COUIBBGBAA	MX-MPC2E-3D-P
MIC 0	REV 28	750-028387	COUIA16BAA	MIC-3D-4XGE-XFP
FPC 4	REV 18	750-046005	PROTOXCLEI	PROTO-ASSEMBLY
FPC 5	REV 35	750-028467		MPC-3D-16XGE-SFPP
FPC 9	REV 30	750-044130	PROTOXCLEI	PROTO-ASSEMBLY
MIC 0	REV 05	750-049457	PROTOXCLEI	PROTO-ASSEMBLY
FPC 10	REV 36	750-044130	PROTOXCLEI	PROTO-ASSEMBLY
MIC 0	REV 06	750-049979	PROTOXCLEI	PROTO-ASSEMBLY
MIC 1	REV 12	750-050008	PROTOXCLEI	PROTO-ASSEMBLY
FPC 17	REV 28	750-044130	PROTOXCLEI	PROTO-ASSEMBLY
MIC 1	REV 03	750-050008	PROTOXCLEI	PROTO-ASSEMBLY
FPC 18	REV 39	750-045715	PROTOXCLEI	PROTO-ASSEMBLY
FPC 19	REV 39	750-045715	PROTOXCLEI	PROTO-ASSEMBLY
ADC 0	REV 17	750-043596	IPUCBA8CAA	MX2000-LC-ADAPTER
ADC 1	REV 17	750-043596	IPUCBA8CAA	MX2000-LC-ADAPTER
ADC 2	REV 17	750-043596	IPUCBA8CAA	MX2000-LC-ADAPTER
ADC 3	REV 17	750-043596	IPUCBA8CAA	MX2000-LC-ADAPTER

ADC 4	REV 02	750-043596	PROTOXCLEI	750-043596
ADC 5	REV 17	750-043596	IPUCBA8CAA	MX2000-LC-ADAPTER
ADC 18	REV 17	750-043596	IPUCBA8CAA	MX2000-LC-ADAPTER
ADC 19	REV 01	750-043596	PROTOXCLEI	750-043596
Fan Tray 0	REV 06	760-046960	IPUCBA5CAA	MX2000-FANTRAY-S
Fan Tray 1	REV 06	760-046960	IPUCBA5CAA	MX2000-FANTRAY-S
Fan Tray 2	REV 06	760-046960	IPUCBA5CAA	MX2000-FANTRAY-S
Fan Tray 3	REV 06	760-046960	IPUCBA5CAA	MX2000-FANTRAY-S

### show chassis hardware (MX Series routers with ATM MIC)

```
user@host> show chassis hardware
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN115736EAFc	MX240
Midplane	REV 07	760-021404	ABAA5038	MX240 Backplane
FPM Board	REV 03	760-021392	ABBA2758	Front Panel Display
PEM 0	Rev 01	740-022697	QCS0937C07K	PS 1.2-1.7kW; 100-240V
AC in				
PEM 1	Rev 01	740-022697	QCS0939C04X	PS 1.2-1.7kW; 100-240V
AC in				
PEM 2	Rev 01	740-022697	QCS0937C06B	PS 1.2-1.7kW; 100-240V
AC in				
PEM 3	Rev 01	740-022697	QCS0937C07U	PS 1.2-1.7kW; 100-240V
AC in				
Routing Engine 0	REV 12	740-013063	9009042291	RE-S-2000
Routing Engine 1	REV 12	740-013063	9009042266	RE-S-2000
CB 0	REV 06	710-021523	ABBC1435	MX SCB
CB 1	REV 06	710-021523	ABBC1497	MX SCB
FPC 2	REV 14	750-031088	YH8446	MPC Type 2 3D Q
CPU	REV 06	711-030884	YH9612	MPC PMB 2G
MIC 0				
MIC 1	REV 10	750-036132	ZP7062	2x0C12/8x0C3 CC-CE
PIC 2		BUILTIN	BUILTIN	2x0C12/8x0C3 CC-CE
Xcvr 0	NON-JNPR	23393-00492		UNKNOWN
Xcvr 1	NON-JNPR	23393-00500		UNKNOWN
Xcvr 2	NON-JNPR	23393-00912		UNKNOWN
Xcvr 3	REV 01	740-015638	22216-00575	Load SFP
Xcvr 4	REV 01	740-015638	24145-00110	Load SFP
Xcvr 5	REV 01	740-015638	24145-00016	Load SFP
Xcvr 6	REV 01	740-015638	24145-00175	Load SFP
Xcvr 7	NON-JNPR	23393-00627		UNKNOWN
QXM 0	REV 05	711-028408	YF4681	MPC QXM
QXM 1	REV 05	711-028408	YF4817	MPC QXM
Fan Tray 0	REV 01	710-021113	XL3645	MX240 Fan Tray

### show chassis hardware (MX240, MX480, MX960 routers with Application Services Modular Line Card)

```
user@host>show chassis hardware
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN11D969BAFA	MX960
Midplane	REV 03	710-013698	ACAA2362	MX960 Backplane

FPM Board	REV 03	710-014974	ZR0639	Front Panel Display
PDM	Rev 03	740-013110	QCS152250SX	Power Distribution Module
PEM 0	Rev 10	740-013683	QCS1512718W	DC Power Entry Module
PEM 1	Rev 10	740-013683	QCS1512702Y	DC Power Entry Module
Routing Engine 0	REV 15	740-013063	9012024667	RE-S-2000
Routing Engine 1	REV 15	740-013063	9012024649	RE-S-2000
CB 0	REV 14	750-031391	ZJ7749	Enhanced MX SCB
CB 1	REV 14	750-031391	ZJ7750	Enhanced MX SCB
CB 2	REV 14	750-031391	ZY9233	Enhanced MX SCB
FPC 0	REV 17	750-031089	YR7434	MPC Type 2 3D
CPU				
FPC 1	REV 11	750-037207	ZW9727	AS-MCC
CPU	REV 04	711-038173	ZW4817	AS-MCC-PMB
MIC 0	REV 01	750-037214	ZH3764	AS-MSC
PIC 0		BUILTIN	BUILTIN	AS-MSC
MIC 1	REV 01	711-028408	JZ9200	AS-MXC
PIC 2		BUILTIN	BUILTIN	AS-MXC
FPC 4	REV 30	750-028467	ABBN0232	MPC 3D 16x 10GE
CPU				
FPC 5	REV 04	750-037207	ZK9074	AS-MCC
CPU				
Fan Tray 0	REV 05	740-014971	VT5683	Fan Tray
Fan Tray 1	REV 05	740-014971	VT5684	Fan Tray

### show chassis hardware extensive (MX240, MX480, MX960 Routers with Application Services Modular Line Card)

```
user@host> show chassis hardware extensive
```

```
ID: AS-MCC                      FRU Model Number: 750-037207
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff I2C Hex Data:
Address 0x10: 00 00 00 00 37 35 30 2d 30 33 37 32 30 37 00 00
Address 0x20: 53 2f 4e 20 5a 57 39 37 32 37 00 00 00 11 02 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 37
Address 0x50: 35 30 2d 30 33 37 32 30 37 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 31 31 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 5e ff ff ff ff ff ff ff ff ff ff ff ff
CPU                      REV 04      711-038173      ZW4817      AS-MCC-PMB
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N: 711-038173      S/N: ZW4817
Assembly ID: 0x0b38      Assembly Version: 01.04
Date: 12-30-2011      Assembly Flags: 0x00
Version: REV 04
ID: AS-MCC-PMB
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff I2C Hex Data:
Address 0x10: 00 00 00 00 37 31 31 2d 30 33 38 31 37 33 00 00
Address 0x20: 53 2f 4e 20 5a 57 34 38 31 37 00 00 00 1e 0c 07
Address 0x30: db ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 50 52 4f 54 4f 58 43 4c 45 49 37
Address 0x50: 31 31 2d 30 33 38 31 37 33 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 30 34 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 60 00 00 00 00 00 00 00 00 00 00 00 00
MIC 0                      REV 01      750-037214      ZH3764      AS-MSC
```

```

Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N: 750-037214        S/N: ZH3764
Assembly ID: 0x0a44     Assembly Version: 01.01
Date: 07-04-2011       Assembly Flags: 0x00
Version: REV 01
ID: AS-MSC
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff I2C Hex Data:
Address 0x00: 7f b0 02 ff 0a 44 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 33 37 32 31 34 00 00
Address 0x20: 53 2f 4e 20 5a 48 33 37 36 34 00 00 00 04 07 07
Address 0x30: db ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 ff ff ff ff ff
Address 0x70: ff ff ff f6 c0 03 e1 bc 00 00 00 00 00 00 00 00
PIC 0          BUILTIN      BUILTIN      AS-MSC
FPC 4          REV 30       750-028467   ABBN0232   MPC 3D 16x 10GE
Jedec Code: 0x7fb0      EEPROM Version: 0x01

```

### show chassis hardware (MX480 Router with MPC4E)

```
user@host> show chassis hardware
```

```

Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis                               JN10FF57BAFB  MX480
Midplane      REV 05   750-047849   Good           MX480 Midplane
FPM Board     REV 02   710-017254   KG2066         Front Panel Display
PEM 0         Rev 03   740-017330   QCS081590BJ    PS 1.2-1.7kW; 100-240V
AC in
PEM 1         Rev 03   740-017330   QCS0815908Z    PS 1.2-1.7kW; 100-240V
AC in
PEM 2         Rev 03   740-029970   QCS1001U001    PS 1.4-2.52kW; 90-264V
AC in
Routing Engine 0 REV 05   740-031116   9009089502     RE-S-1800x4
Routing Engine 1 REV 05   740-031116   9009089624     RE-S-1800x4
CB 0          REV 02   750-031391   YE8506         Enhanced MX SCB
CB 1          REV 14   750-031391   ZK8265         Enhanced MX SCB
FPC 2         REV 05   750-037358   ZT0638         MPC4E 3D 32XGE
CPU           REV 07   711-035209   ZK3187         HMPD PMB 2G
PIC 0          BUILTIN  BUILTIN        8X10GE SFPP
PIC 1          BUILTIN  BUILTIN        8X10GE SFPP
PIC 2          BUILTIN  BUILTIN        8X10GE SFPP
PIC 3          BUILTIN  BUILTIN        8X10GE SFPP
FPC 3         REV 06   750-037355   CAAB1144       MPC4E 3D 2CGE+8XGE
CPU           REV 08   711-035209   CAAB1278       HMPD PMB 2G
PIC 0          BUILTIN  BUILTIN        4x10GE SFPP
Xcvr 0        REV 01   740-031980   B11E01439     SFP+-10G-SR
Xcvr 1        REV 01   740-031980   B11D05809     SFP+-10G-SR
PIC 1          BUILTIN  BUILTIN        1X100GE CFP
Xcvr 0        NON-JNPR D5418         UNKNOWN
PIC 2          BUILTIN  BUILTIN        4x10GE SFPP
PIC 3          BUILTIN  BUILTIN        1X100GE CFP
Xcvr 0        NON-JNPR X12J00362     CFP-100G-SR10
FPC 4         REV 12.3.10 750-033205   YR9445         MPCE Type 3 3D
CPU
Fan Tray                               Enhanced Left Fan Tray

```

## show chassis hardware (MX2020 Router with MPC4E)

user@host&gt; show chassis hardware

## Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN11E188CAFJ	MX2020
Midplane				Lower Backplane
Midplane 1	REV 04	711-032387	ABAC7474	Upper Backplane
PMP 1	REV 03	711-032428	ACAJ1137	Upper Power Midplane
PMP 0	REV 03	711-032426	ACAJ1016	Lower Power Midplane
FPM Board	REV 06	760-040242	ABBT8832	Front Panel Display
PSM 3	REV 0C	740-033727	VK00255	DC 52V Power Supply
Module				
PSM 4	REV 0C	740-033727	VJ00148	DC 52V Power Supply
Module				
PSM 5	REV 0C	740-033727	VK00207	DC 52V Power Supply
Module				
PSM 6	REV 0C	740-033727	VK00319	DC 52V Power Supply
Module				
PSM 7	REV 0C	740-033727	VK00264	DC 52V Power Supply
Module				
PSM 8	REV 0B	740-033727	VG00025	DC 52V Power Supply
Module				
PSM 13	REV 0C	740-033727	VK00274	DC 52V Power Supply
Module				
PSM 14	REV 0C	740-033727	VJ00167	DC 52V Power Supply
Module				
PSM 15	REV 0C	740-033727	VK00299	DC 52V Power Supply
Module				
PSM 16	REV 0C	740-033727	VK00213	DC 52V Power Supply
Module				
PSM 17	REV 0C	740-033727	VK00253	DC 52V Power Supply
Module				
PDM 0	REV 0B	740-038109	VJ00040	DC Power Dist Module
PDM 2	REV 0B	740-038109	VJ00025	DC Power Dist Module
Routing Engine 0	REV 02	740-041821	9009089735	RE-S-1800x4
Routing Engine 1	REV 02	740-041821	9009089731	RE-S-1800x4
CB 0	REV 04	750-040257	ZT2846	Control Board
CB 1	REV 04	750-040257	ZT2877	Control Board
SPMB 0	REV 01	711-041855	ZS2282	PMB Board
SPMB 1	REV 01	711-041855	ZS2261	PMB Board
SFB 0	REV 07	711-032385	ZZ2582	Switch Fabric Board
SFB 1	REV 04	711-032385	ZV4229	Switch Fabric Board
SFB 2	REV 07	711-032385	CAAB4902	Switch Fabric Board
SFB 3	REV 07	711-032385	CAAB4891	Switch Fabric Board
SFB 4	REV 07	711-032385	CAAB4883	Switch Fabric Board
SFB 5	REV 07	711-032385	CAAB4889	Switch Fabric Board
SFB 6	REV 06	711-032385	ZV1818	Switch Fabric Board
SFB 7	REV 07	711-032385	CAAB4897	Switch Fabric Board
FPC 0	REV 34	750-031090	ZT9799	MPC Type 2 3D EQ
CPU	REV 06	711-030884	ZS1122	MPC PMB 2G
MIC 0	REV 11	750-033535	CAAD7674	MIC-3D-10C192-XFP
PIC 0		BUILTIN	BUILTIN	MIC-3D-10C192-XFP
Xcvr 0	REV 01	740-014279	753019A00404	XFP-OC192-SR
MIC 1	REV 14	750-031967	ZM6103	MIC-3D-80C30C12-40C48
PIC 2		BUILTIN	BUILTIN	MIC-3D-80C30C12-40C48
Xcvr 0	REV 01	740-011615	PEF1AZP	SFP-IR
Xcvr 1	REV 01	740-011615	PEF1AZN	SFP-IR
Xcvr 2	REV 01	740-021308	ANA0N8S	SFP+-10G-SR
QXM 0	REV 06	711-028408	ZT9339	MPC QXM

QXM 1	REV 06	711-028408	ZT9237	MPC QXM
FPC 9	REV 34	750-031090	ZT9770	MPC Type 2 3D EQ
CPU	REV 06	711-030884	ZS1302	MPC PMB 2G
MIC 0	REV 24	750-028387	YJ3950	3D 4x 10GE XFP
PIC 0		BUILTIN	BUILTIN	2x 10GE XFP
Xcvr 0		NON-JNPR	T09M52516	XFP-10G-SR
Xcvr 1		NON-JNPR	CA49BK095	XFP-10G-SR
PIC 1		BUILTIN	BUILTIN	2x 10GE XFP
Xcvr 0	REV 02	740-014289	C834XU01T	XFP-10G-SR
Xcvr 1		NON-JNPR	T09M52515	XFP-10G-SR
MIC 1	REV 11	750-033535	CAAD7681	MIC-3D-10C192-XFP
PIC 2		BUILTIN	BUILTIN	MIC-3D-10C192-XFP
Xcvr 0	REV 01	740-014279	KBQ02BE	XFP-0C192-SR
QXM 0	REV 06	711-028408	ZT9151	MPC QXM
QXM 1	REV 06	711-028408	ZT9116	MPC QXM
FPC 10	REV 27	750-033205	ZL6215	MPCE Type 3 3D
CPU	REV 07	711-035209	ZK9038	HMPC PMB 2G
MIC 0	REV 18	750-028380	YG6885	3D 2x 10GE XFP
PIC 0		BUILTIN	BUILTIN	1x 10GE XFP
Xcvr 0	REV 01	740-014289	C706XU0AG	XFP-10G-SR
PIC 1		BUILTIN	BUILTIN	1x 10GE XFP
Xcvr 0	REV 02	740-014289	T08L84366	XFP-10G-SR
FPC 14	REV 09	750-037355	CAAF1534	MPC4E 3D 2CGE+8XGE
CPU	REV 08	711-035209	CAAB9879	HMPC PMB 2G
PIC 0		BUILTIN	BUILTIN	4x10GE SFP+
Xcvr 0	REV 01	740-021308	21T511100436	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AHPOGPM	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	123363A00032	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	19T511100477	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	1X100GE CFP
Xcvr 0		NON-JNPR	X12J00260	CFP-100G-SR10
PIC 2		BUILTIN	BUILTIN	4x10GE SFP+
Xcvr 0	REV 01	740-021308	21T511104086	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	21T511104627	SFP+-10G-SR
Xcvr 3	REV 01	740-021308	21T511104644	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	1X100GE CFP
FPC 19	REV 32	750-028467	ZR2008	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ZT6933	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	19T511100291	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AMH02VE	SFP+-10G-SR
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	23T511102128	SFP+-10G-SR
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	AMS15PP	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	123363A00716	SFP+-10G-SR
ADC 0	REV 05	750-043596	CAAC2072	Adapter Card
ADC 9	REV 01	750-043596	ZV4111	Adapter Card
ADC 10	REV 05	750-043596	CAAC2058	Adapter Card
ADC 14	REV 02	750-043596	ZW1561	Adapter Card
ADC 19	REV 01	750-043596	ZV4127	Adapter Card
Fan Tray 0	REV 03	760-046960	ACAY0124	172mm FanTray - 6 Fans
Fan Tray 1	REV 2A	760-046960	ACAY0022	172mm FanTray - 6 Fans
Fan Tray 2	REV 2A	760-046960	ACAY0023	172mm FanTray - 6 Fans
Fan Tray 3	REV 2A	760-046960	ACAY0025	172mm FanTray - 6 Fans

### show chassis hardware (MX5, MX10, MX40, MX80, MX240, MX480, and MX960 Routers with Enhanced 20-Port Gigabit Ethernet MIC)

```
user@host> show chassis hardware
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			F3434	MX80-P
Midplane	REV 01	711-044315	ZK2681	MX80-P
PEM 0	Rev 04	740-028288	VE05267	AC Power Entry Module
PEM 1	Rev 04	740-028288	VE05270	AC Power Entry Module
Routing Engine		BUILTIN	BUILTIN	Routing Engine
TFEB 0		BUILTIN	BUILTIN	Forwarding Engine
Processor				
QXM 0	REV 05	711-028408	ZK0952	MPC QXM
FPC 0		BUILTIN	BUILTIN	MPC BUILTIN
MIC 0		BUILTIN	BUILTIN	4x 10GE XFP
PIC 0		BUILTIN	BUILTIN	4x 10GE XFP
FPC 1		BUILTIN	BUILTIN	MPC BUILTIN
MIC 0	REV 02	750-049846	CAAV2153	3D 20x 1GE(LAN)-E,SFP
PIC 0		BUILTIN	BUILTIN	10x 1GE(LAN) -E SFP
Xcvr 0	REV 01	740-011613	AM0816S9B81	SFP-SX
Xcvr 1	REV 02	740-011613	AM0925SBLK7	SFP-SX
Xcvr 2	REV 01	740-011613	UAQ0005	SFP-SX
Xcvr 3	REV 01	740-011613	UAQ000C	SFP-SX
Xcvr 4	REV 01	740-011613	P9F195E	SFP-SX
Xcvr 5	REV 01	740-011613	UAQ0003	SFP-SX
Xcvr 6	REV 01	740-031851	AM1041SU1LD	SFP-SX
Xcvr 8	REV 02	740-013111	B101501	SFP-T
PIC 1		BUILTIN	BUILTIN	10x 1GE(LAN) -E SFP
Xcvr 0	REV 01	740-011613	PFM1ML7	SFP-SX
Xcvr 4	REV 01	740-011613	PE729P6	SFP-SX
Xcvr 6	REV 02	740-011613	AM1014SGC84	SFP-SX
Xcvr 9	REV 01	740-011613	AM0812S8UK3	SFP-SX
MIC 1	REV 26	750-028392	ZY0187	3D 20x 1GE(LAN) SFP
PIC 2		BUILTIN	BUILTIN	10x 1GE(LAN) SFP
Xcvr 0	REV 01	740-011613	P9F1AN9	SFP-SX
Xcvr 5	REV 02	740-011613	AM1003SFUF4	SFP-SX
Xcvr 9	REV 01	740-031851	AM1041SU1LM	SFP-SX
PIC 3		BUILTIN	BUILTIN	10x 1GE(LAN) SFP
Xcvr 4	REV 01	740-011613	PAJ4MYT	SFP-SX
Xcvr 7	+	NON-JNPR	XG32A024	SFP-SX
Xcvr 8		NON-JNPR	PFROV6J	SFP-SX
Xcvr 9	REV 01	740-031851	AM1041SU02U	SFP-SX
Fan Tray				

### show chassis hardware models (MX5, MX10, MX40, MX80, MX240, MX480, and MX960 Routers with Enhanced 20-Port Gigabit Ethernet MIC)

```
user@host> show chassis hardware models
```

Hardware inventory:

Item	Version	Part number	Serial number	FRU model number
PEM 0	Rev 04	740-028288	VE05267	PWR-MX80-AC-S
PEM 1	Rev 04	740-028288	VE05270	PWR-MX80-AC-S
Routing Engine		BUILTIN	BUILTIN	
TFEB 0		BUILTIN	BUILTIN	
FPC 0		BUILTIN	BUILTIN	
FPC 1		BUILTIN	BUILTIN	
MIC 0	REV 02	750-049846	CAAV2153	MIC-3D-20GE-SFP-E

MIC 1 Fan Tray	REV 26	750-028392	ZY0187	MIC-3D-20GE-SFP FANTRAY-MX80-S
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## show chassis hardware (MX2008 Router)

user@host&gt;show chassis hardware

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN1259E1CAFL	MX2008
Midplane	REV 47	750-044636	ABAD1739	Lower Backplane
PMP	REV 01	711-051406	ACVD0738	Power Midplane
FPM Board	REV 02	760-068193	ABDG7408	Front Panel Display
PSM 1	REV 06	740-050037	1EDB61200R8	DC 52V Power Supply
Module				
PSM 2	REV 06	740-050037	1EDB61200WA	DC 52V Power Supply
Module				
PSM 3	REV 06	740-050037	1EDB61200NY	DC 52V Power Supply
Module				
PSM 4	REV 06	740-050037	1EDB61200N2	DC 52V Power Supply
Module				
PSM 5	REV 06	740-050037	1EDB61200RN	DC 52V Power Supply
Module				
PSM 6	REV 06	740-050037	1EDB61200RF	DC 52V Power Supply
Module				
PSM 7	REV 06	740-050037	1EDB61200R7	DC 52V Power Supply
Module				
PDM 0	REV 01	740-060189	1EFF5250143	DC PDM Optimized
PDM 1	REV 01	740-060189	1EFF5250074	DC PDM Optimized
Routing Engine 0		BUILTIN	BUILTIN	RE-S-2X00x8
Routing Engine 1		BUILTIN	BUILTIN	RE-S-2X00x8
CB 0	REV 01	750-067373	ABDJ0047	Control Board
CB 1	REV 03	750-067373	ABDH3016	Control Board
SFB 0	REV 08	750-067371	ABDK7180	Switch Fabric Board
SFB 1	REV 08	750-067371	ABDK7024	Switch Fabric Board
SFB 2	REV 08	750-067371	ABDK7188	Switch Fabric Board
SFB 3	REV 08	750-067371	ABDK7143	Switch Fabric Board
SFB 4	REV 08	750-067371	ABDK7030	Switch Fabric Board
SFB 5	REV 08	750-067371	ABDK7146	Switch Fabric Board
SFB 6	REV 08	750-067371	ABDK7203	Switch Fabric Board
SFB 7	REV 08	750-067371	ABDK7238	Switch Fabric Board
FPC 0	REV 36	750-044130	ABCS8607	MPC6E 3D
CPU	REV 09	711-045719	ABCS8776	RMPD PMB
MIC 0	REV 21	750-050008	ABCT5920	4X100GE CXP
PIC 0		BUILTIN	BUILTIN	4X100GE CXP
XLM 0	REV 07.2.00	711-046638	ABCK3488	MPC6E XL
XLM 1	REV 07.2.00	711-046638	ABCK5482	MPC6E XL
FPC 1	REV 22	750-063414	CAFJ3026	MPC9E 3D
CPU	REV 16	750-057177	CAFF9332	SMPC PMB
FPC 7	REV 08	750-038492	ZX4080	MPCE Type 2 3D EQ
CPU	REV 03	711-038484	ZX3665	MPCE PMB 2G
MIC 0	REV 05	750-037128	ZR4031	1xCOC12/4xCOC3 CH-CE
PIC 0		BUILTIN	BUILTIN	1xCOC12/4xCOC3 CH-CE
MIC 1	REV 23	750-032479	CADE8614	MIC-3D-8DS3-E3
PIC 2		BUILTIN	BUILTIN	MIC-3D-8DS3-E3
QXM 0	REV 06	711-028408	ZW8299	MPC QXM
QXM 1	REV 06	711-028408	ZY0609	MPC QXM
ADC 7	REV 17	750-043596	ABCA0990	Adapter Card
Fan Tray 0	REV 01	760-052467	ACAY6190	172mm FanTray - 6 Fans
Fan Tray 1	REV 01	760-052467	ACAY6414	172mm FanTray - 6 Fans



## show chassis hardware detail (MX2008 Router)

user@host&gt;show chassis hardware detail

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN1259E1CAFL	MX2008
Midplane	REV 47	750-044636	ABAD1739	Lower Backplane
PMP	REV 01	711-051406	ACVD0738	Power Midplane
FPM Board	REV 02	760-068193	ABDG7408	Front Panel Display
PSM 1	REV 06	740-050037	1EDB61200R8	DC 52V Power Supply
Module				
PSM 2	REV 06	740-050037	1EDB61200WA	DC 52V Power Supply
Module				
PSM 3	REV 06	740-050037	1EDB61200NY	DC 52V Power Supply
Module				
PSM 4	REV 06	740-050037	1EDB61200N2	DC 52V Power Supply
Module				
PSM 5	REV 06	740-050037	1EDB61200RN	DC 52V Power Supply
Module				
PSM 6	REV 06	740-050037	1EDB61200RF	DC 52V Power Supply
Module				
PSM 7	REV 06	740-050037	1EDB61200R7	DC 52V Power Supply
Module				
PDM 0	REV 01	740-060189	1EFF5250143	DC PDM Optimized
PDM 1	REV 01	740-060189	1EFF5250074	DC PDM Optimized
Routing Engine 0		BUILTIN	BUILTIN	RE-S-2X00x8
vtbd0 15361 MB				Virtio Block Disk
vtbd1 15360 MB				Virtio Block Disk
ada0 511 MB	QEMU HARDDISK		QM00002	Emulated IDE Disk
usb0 (addr 1)	XHCI root HUB 0		0x8086	uhub0
Routing Engine 1		BUILTIN	BUILTIN	RE-S-2X00x8
vtbd0 15361 MB				Virtio Block Disk
vtbd1 15360 MB				Virtio Block Disk
ada0 511 MB	QEMU HARDDISK		QM00002	Emulated IDE Disk
usb0 (addr 1)	XHCI root HUB 0		0x8086	uhub0
CB 0	REV 01	750-067373	ABDJ0047	Control Board
CB 1	REV 03	750-067373	ABDH3016	Control Board
SFB 0	REV 08	750-067371	ABDK7180	Switch Fabric Board
SFB 1	REV 08	750-067371	ABDK7024	Switch Fabric Board
SFB 2	REV 08	750-067371	ABDK7188	Switch Fabric Board
SFB 3	REV 08	750-067371	ABDK7143	Switch Fabric Board
SFB 4	REV 08	750-067371	ABDK7030	Switch Fabric Board
SFB 5	REV 08	750-067371	ABDK7146	Switch Fabric Board
SFB 6	REV 08	750-067371	ABDK7203	Switch Fabric Board
SFB 7	REV 08	750-067371	ABDK7238	Switch Fabric Board
FPC 0	REV 36	750-044130	ABCS8607	MPC6E 3D
CPU	REV 09	711-045719	ABCS8776	RMPC PMB
MIC 0	REV 21	750-050008	ABCT5920	4X100GE CXP
PIC 0		BUILTIN	BUILTIN	4X100GE CXP
XLM 0	REV 07.2.00	711-046638	ABCK3488	MPC6E XL
XLM 1	REV 07.2.00	711-046638	ABCK5482	MPC6E XL
FPC 1	REV 22	750-063414	CAFJ3026	MPC9E 3D
CPU	REV 16	750-057177	CAFF9332	SMPC PMB
FPC 7	REV 08	750-038492	ZX4080	MPCE Type 2 3D EQ
CPU	REV 03	711-038484	ZX3665	MPCE PMB 2G
MIC 0	REV 05	750-037128	ZR4031	1xCOC12/4xCOC3 CH-CE
PIC 0		BUILTIN	BUILTIN	1xCOC12/4xCOC3 CH-CE
MIC 1	REV 23	750-032479	CADE8614	MIC-3D-8DS3-E3
PIC 2		BUILTIN	BUILTIN	MIC-3D-8DS3-E3

QXM 0	REV 06	711-028408	ZW8299	MPC QXM
QXM 1	REV 06	711-028408	ZY0609	MPC QXM
ADC 7	REV 17	750-043596	ABCA0990	Adapter Card
Fan Tray 0	REV 01	760-052467	ACAY6190	172mm FanTray - 6 Fans
Fan Tray 1	REV 01	760-052467	ACAY6414	172mm FanTray - 6 Fans

### show chassis hardware extensive (MX2008 Router)

```
user@host>show chassis hardware extensive
```

#### Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN1259E1CAFL	MX2008

```
Jedec Code: 0x7fb0      EEPROM Version: 0x02
                        S/N: JN1259E1CAFL
Assembly ID: 0x0557      Assembly Version: 00.00
Date: 00-00-0000        Assembly Flags: 0x00
ID: MX2008
```

#### Board Information Record:

```
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

#### I2C Hex Data:

```
Address 0x00: 7f b0 02 ff 05 57 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x20: 4a 4e 31 32 35 39 45 31 43 41 46 4c 00 00 00 00
Address 0x30: 00 00 00 ff 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

Midplane	REV 47	750-044636	ABAD1739	Lower Backplane
----------	--------	------------	----------	-----------------

```
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N: 750-044636        S/N: ABAD1739
Assembly ID: 0x0b66      Assembly Version: 01.47
Date: 06-08-2016        Assembly Flags: 0x00
Version: REV 47          CLEI Code: IPMU810ARB
ID: Lower Backplane      FRU Model Number: CHAS-BP-MX2010-S
```

#### Board Information Record:

```
Address 0x00: ad 01 08 00 f4 cc 55 3e 35 00 ff ff ff ff ff ff
```

#### I2C Hex Data:

```
Address 0x00: 7f b0 02 ff 0b 66 01 2f 52 45 56 20 34 37 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 34 34 36 33 36 00 00
Address 0x20: 53 2f 4e 20 41 42 41 44 31 37 33 39 00 08 06 07
Address 0x30: e0 ff ff ff ad 01 08 00 f4 cc 55 3e 35 00 ff ff
Address 0x40: ff ff ff ff 01 49 50 4d 55 38 31 30 41 52 42 43
Address 0x50: 48 41 53 2d 42 50 2d 4d 58 32 30 31 30 2d 53 00
Address 0x60: 00 00 00 00 00 00 42 43 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 18 ff ff ff ff ff ff ff ff ff ff ff ff
```

PMP	REV 01	711-051406	ACVD0738	Power Midplane
-----	--------	------------	----------	----------------

```
Jedec Code: 0x7fb0      EEPROM Version: 0x01
P/N: 711-051406        S/N: ACVD0738
Assembly ID: 0x045d      Assembly Version: 01.01
Date: 06-06-2016        Assembly Flags: 0x00
Version: REV 01
```

#### ID: Power Midplane

#### Board Information Record:

```
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
```

#### I2C Hex Data:

```
Address 0x00: 7f b0 01 ff 04 5d 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 35 31 34 30 36 00 00
Address 0x20: 53 2f 4e 20 41 43 56 44 30 37 33 38 00 06 06 07
```

```

Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM Board      REV 02   760-068193   ABDG7408      Front Panel Display
Jedec Code:    0x7fb0      EEPROM Version: 0x02
P/N:           760-068193   S/N:           ABDG7408
Assembly ID:   0x0cac      Assembly Version: 01.02
Date:          06-06-2016   Assembly Flags: 0x00
Version:       REV 02      CLEI Code:     PROTOXCLEI
ID: Front Panel Display    FRU Model Number: PROTO-ASSEMBLY
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 fe 0c ac 01 02 52 45 56 20 30 32 00 00
Address 0x10: 00 00 00 00 37 36 30 2d 30 36 38 31 39 33 00 00
Address 0x20: 53 2f 4e 20 41 42 44 47 37 34 30 38 00 06 06 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff
PSM 1          REV 06   740-050037   1EDB61200R8   DC 52V Power Supply
Module
Jedec Code:    0x7fb0      EEPROM Version: 0x02
P/N:           740-050037   S/N:           1EDB61200R8
Assembly ID:   0x0478      Assembly Version: 01.06
Date:          03-16-2016   Assembly Flags: 0x00
Version:       REV 06      CLEI Code:     IPUPAPDKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 06 52 45 56 20 30 36 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 36 31 32 30 30 52 38 00 00 10 03 07
Address 0x30: e0 72 75 ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 50 44 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 36 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 26 00 00 00 00 00 00 00 00 00 00 00 00
PSM 2          REV 06   740-050037   1EDB61200WA   DC 52V Power Supply
Module
Jedec Code:    0x7fb0      EEPROM Version: 0x02
P/N:           740-050037   S/N:           1EDB61200WA
Assembly ID:   0x0478      Assembly Version: 01.06
Date:          03-16-2016   Assembly Flags: 0x00
Version:       REV 06      CLEI Code:     IPUPAPDKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 06 52 45 56 20 30 36 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 36 31 32 30 30 57 41 00 00 10 03 07
Address 0x30: e0 72 75 ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 50 44 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 36 ff ff ff ff ff ff ff

```

```

Address 0x70: ff ff ff 26 00 00 00 00 00 00 00 00 00 00 00 00
PSM 3          REV 06  740-050037  1EDB61200NY      DC 52V Power Supply
Module
Jedec Code:    0x7fb0          EEPROM Version:  0x02
P/N:           740-050037      S/N:            1EDB61200NY
Assembly ID:   0x0478          Assembly Version: 01.06
Date:          03-16-2016      Assembly Flags:  0x00
Version:       REV 06          CLEI Code:       IPUPAPDKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 06 52 45 56 20 30 36 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 36 31 32 30 30 4e 59 00 00 10 03 07
Address 0x30: e0 72 75 ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 50 44 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 36 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 26 00 00 00 00 00 00 00 00 00 00 00 00
PSM 4          REV 06  740-050037  1EDB61200N2      DC 52V Power Supply
Module
Jedec Code:    0x7fb0          EEPROM Version:  0x02
P/N:           740-050037      S/N:            1EDB61200N2
Assembly ID:   0x0478          Assembly Version: 01.06
Date:          03-16-2016      Assembly Flags:  0x00
Version:       REV 06          CLEI Code:       IPUPAPDKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 06 52 45 56 20 30 36 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 36 31 32 30 30 4e 32 00 00 10 03 07
Address 0x30: e0 72 75 ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 50 44 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 36 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 26 00 00 00 00 00 00 00 00 00 00 00 00
PSM 5          REV 06  740-050037  1EDB61200RN      DC 52V Power Supply
Module
Jedec Code:    0x7fb0          EEPROM Version:  0x02
P/N:           740-050037      S/N:            1EDB61200RN
Assembly ID:   0x0478          Assembly Version: 01.06
Date:          03-16-2016      Assembly Flags:  0x00
Version:       REV 06          CLEI Code:       IPUPAPDKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 78 01 06 52 45 56 20 30 36 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
Address 0x20: 31 45 44 42 36 31 32 30 30 52 4e 00 00 10 03 07
Address 0x30: e0 72 75 ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 50 44 4b 41 41 4d
Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
Address 0x60: 00 00 00 00 00 00 31 30 36 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 26 00 00 00 00 00 00 00 00 00 00 00 00
PSM 6          REV 06  740-050037  1EDB61200RF      DC 52V Power Supply
Module

```

```

Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N: 740-050037        S/N: 1EDB61200RF
Assembly ID: 0x0478     Assembly Version: 01.06
Date: 03-16-2016       Assembly Flags: 0x00
Version: REV 06        CLEI Code: IPUPAPDKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 06 52 45 56 20 30 36 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 36 31 32 30 30 52 46 00 00 10 03 07
  Address 0x30: e0 72 75 ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 50 44 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 36 ff ff ff ff ff ff
  Address 0x70: ff ff ff 26 00 00 00 00 00 00 00 00 00 00 00
PSM 7          REV 06 740-050037 1EDB61200R7      DC 52V Power Supply
Module
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N: 740-050037        S/N: 1EDB61200R7
Assembly ID: 0x0478     Assembly Version: 01.06
Date: 03-16-2016       Assembly Flags: 0x00
Version: REV 06        CLEI Code: IPUPAPDKAA
ID: DC 52V Power Supply Module FRU Model Number: MX2000-PSM-DC-S
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 06 52 45 56 20 30 36 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 35 30 30 33 37 00 00
  Address 0x20: 31 45 44 42 36 31 32 30 30 52 37 00 00 10 03 07
  Address 0x30: e0 72 75 ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 50 44 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 44 43 2d 53 00 00
  Address 0x60: 00 00 00 00 00 00 31 30 36 ff ff ff ff ff ff
  Address 0x70: ff ff ff 26 00 00 00 00 00 00 00 00 00 00 00
PDM 0          REV 01 740-060189 1EFF5250143      DC PDM Optimized
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N: 740-060189        S/N: 1EFF5250143
Assembly ID: 0x0495     Assembly Version: 01.01
Date: 07-21-2015       Assembly Flags: 0x00
Version: REV 01        CLEI Code: IPUPAN1KAA
ID: DC PDM Optimized   FRU Model Number: MX2K-PDM-OP-DC-S
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 95 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 36 30 31 38 39 00 00
  Address 0x20: 31 45 46 46 35 32 35 30 31 34 33 00 00 15 07 07
  Address 0x30: df ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4e 31 4b 41 41 4d
  Address 0x50: 58 32 4b 2d 50 44 4d 2d 4f 50 2d 44 43 2d 53 00
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff
  Address 0x70: ff ff ff 84 00 00 00 00 00 00 00 00 00 00 00
PDM 1          REV 01 740-060189 1EFF5250074      DC PDM Optimized
Jedec Code: 0x7fb0      EEPROM Version: 0x02
P/N: 740-060189        S/N: 1EFF5250074
Assembly ID: 0x0495     Assembly Version: 01.01
Date: 07-21-2015       Assembly Flags: 0x00
Version: REV 01        CLEI Code: IPUPAN1KAA

```

```

ID: DC PDM Optimized          FRU Model Number: MX2K-PDM-OP-DC-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 95 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 36 30 31 38 39 00 00
Address 0x20: 31 45 46 46 35 32 35 30 30 37 34 00 00 15 07 07
Address 0x30: df ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 50 41 4e 31 4b 41 41 4d
Address 0x50: 58 32 4b 2d 50 44 4d 2d 4f 50 2d 44 43 2d 53 00
Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 84 00 00 00 00 00 00 00 00 00 00 00 00
Routing Engine 0          BUILTIN          BUILTIN          RE-S-2X00x8
Jedec Code: 0x0000          EEPROM Version: 0x00
P/N: BUILTIN          S/N: BUILTIN
Assembly ID: 0x0c10          Assembly Version: 00.00
Date: 00-00-0000          Assembly Flags: 0x00
ID: RE-S-2X00x8
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0c 10 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 00 00 00 00
Address 0x20: 42 55 49 4c 54 49 4e 00 00 00 00 00 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
vtbd0 15361 MB          Virtio Block Disk
vtbd1 15360 MB          Virtio Block Disk
ada0 511 MB QEMU HARDDISK          QM00002          Emulated IDE Disk
usb0 (addr 1) XHCI root HUB 0          0x8086          uhub0
Routing Engine 1          BUILTIN          BUILTIN          RE-S-2X00x8
Jedec Code: 0x0000          EEPROM Version: 0x00
P/N: BUILTIN          S/N: BUILTIN
Assembly ID: 0x0c10          Assembly Version: 00.00
Date: 00-00-0000          Assembly Flags: 0x00
ID: RE-S-2X00x8
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0c 10 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 00 00 00 00
Address 0x20: 42 55 49 4c 54 49 4e 00 00 00 00 00 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
vtbd0 15361 MB          Virtio Block Disk
vtbd1 15360 MB          Virtio Block Disk
ada0 511 MB QEMU HARDDISK          QM00002          Emulated IDE Disk
usb0 (addr 1) XHCI root HUB 0          0x8086          uhub0
CB 0          REV 01 750-067373 ABDJ0047          Control Board
Jedec Code: 0x7fb0          EEPROM Version: 0x02
P/N: 750-067373          S/N: ABDJ0047
Assembly ID: 0x0c96          Assembly Version: 01.01
Date: 06-21-2016          Assembly Flags: 0x00
Version: REV 01          CLEI Code: PROTOXCLEI

```

```

ID: Control Board          FRU Model Number:  PROTO-ASSEMBLY
Board Information Record:
Address 0x00: ad 01 00 20 28 8a 1c 6d c4 7e ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 fe 0c 96 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 36 37 33 37 33 00 00
Address 0x20: 53 2f 4e 20 41 42 44 4a 30 30 34 37 00 15 06 07
Address 0x30: e0 ff ff ff ad 01 00 20 28 8a 1c 6d c4 7e ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff

CB 1          REV 03    750-067373    ABDH3016          Control Board
Jedec Code:   0x7fb0          EEPROM Version:   0x02
P/N:          750-067373      S/N:             ABDH3016
Assembly ID:  0x0c96          Assembly Version: 01.03
Date:         05-07-2016      Assembly Flags:   0x00
Version:      REV 03          CLEI Code:        PROTOXCLEI
ID: Control Board          FRU Model Number:  PROTO-ASSEMBLY
Board Information Record:
Address 0x00: ad 01 00 20 f4 cc 55 35 71 a0 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 fe 0c 96 01 03 52 45 56 20 30 33 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 36 37 33 37 33 00 00
Address 0x20: 53 2f 4e 20 41 42 44 48 33 30 31 36 00 07 05 07
Address 0x30: e0 ff ff ff ad 01 00 20 f4 cc 55 35 71 a0 ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff

SFB 0          REV 08    750-067371    ABDK7180          Switch Fabric Board
Jedec Code:   0x7fb0          EEPROM Version:   0x02
P/N:          750-067371      S/N:             ABDK7180
Assembly ID:  0x0c97          Assembly Version: 01.08
Date:         09-27-2016      Assembly Flags:   0x00
Version:      REV 08          CLEI Code:        PROTOXCLEI
ID: Switch Fabric Board      FRU Model Number:  PROTO-ASSEMBLY
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 fe 0c 97 01 08 52 45 56 20 30 38 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 36 37 33 37 31 00 00
Address 0x20: 53 2f 4e 20 41 42 44 4b 37 31 38 30 00 1b 09 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 07 00 00 00 00 00 00 00 00 00 48 00

SFB 1          REV 08    750-067371    ABDK7024          Switch Fabric Board
Jedec Code:   0x7fb0          EEPROM Version:   0x02
P/N:          750-067371      S/N:             ABDK7024
Assembly ID:  0x0c97          Assembly Version: 01.08
Date:         09-27-2016      Assembly Flags:   0x00
Version:      REV 08          CLEI Code:        PROTOXCLEI
ID: Switch Fabric Board      FRU Model Number:  PROTO-ASSEMBLY
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 fe 0c 97 01 08 52 45 56 20 30 38 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 36 37 33 37 31 00 00

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Address 0x20: 53 2f 4e 20 41 42 44 4b 37 30 32 34 00 1b 09 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff
Address 0x70: ff ff ff c2 07 00 00 00 00 00 00 01 00 48 00
SFB 2          REV 08    750-067371    ABDK7188          Switch Fabric Board
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-067371      S/N:           ABDK7188
Assembly ID:   0x0c97          Assembly Version: 01.08
Date:          09-28-2016      Assembly Flags: 0x00
Version:       REV 08          CLEI Code:     PROTOXCLEI
ID: Switch Fabric Board        FRU Model Number: PROTO-ASSEMBLY
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 fe 0c 97 01 08 52 45 56 20 30 38 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 36 37 33 37 31 00 00
Address 0x20: 53 2f 4e 20 41 42 44 4b 37 31 38 38 00 1c 09 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff
Address 0x70: ff ff ff c2 07 00 00 00 00 00 00 02 00 48 00
SFB 3          REV 08    750-067371    ABDK7143          Switch Fabric Board
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-067371      S/N:           ABDK7143
Assembly ID:   0x0c97          Assembly Version: 01.08
Date:          09-27-2016      Assembly Flags: 0x00
Version:       REV 08          CLEI Code:     PROTOXCLEI
ID: Switch Fabric Board        FRU Model Number: PROTO-ASSEMBLY
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 fe 0c 97 01 08 52 45 56 20 30 38 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 36 37 33 37 31 00 00
Address 0x20: 53 2f 4e 20 41 42 44 4b 37 31 34 33 00 1b 09 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff
Address 0x70: ff ff ff c2 07 00 00 00 00 00 00 03 00 48 00
SFB 4          REV 08    750-067371    ABDK7030          Switch Fabric Board
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-067371      S/N:           ABDK7030
Assembly ID:   0x0c97          Assembly Version: 01.08
Date:          09-24-2016      Assembly Flags: 0x00
Version:       REV 08          CLEI Code:     PROTOXCLEI
ID: Switch Fabric Board        FRU Model Number: PROTO-ASSEMBLY
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 fe 0c 97 01 08 52 45 56 20 30 38 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 36 37 33 37 31 00 00
Address 0x20: 53 2f 4e 20 41 42 44 4b 37 30 33 30 00 18 09 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff
Address 0x70: ff ff ff c2 07 00 00 00 00 00 00 04 00 48 00

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SFB 5          REV 08    750-067371    ABDK7146          Switch Fabric Board
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-067371      S/N:           ABDK7146
Assembly ID:   0x0c97          Assembly Version: 01.08
Date:          09-27-2016      Assembly Flags: 0x00
Version:       REV 08          CLEI Code:     PROTOXCLEI
ID: Switch Fabric Board      FRU Model Number: PROTO-ASSEMBLY

Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 fe 0c 97 01 08 52 45 56 20 30 38 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 36 37 33 37 31 00 00
  Address 0x20: 53 2f 4e 20 41 42 44 4b 37 31 34 36 00 1b 09 07
  Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
  Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff c2 07 00 00 00 00 00 00 00 05 00 48 00

SFB 6          REV 08    750-067371    ABDK7203          Switch Fabric Board
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-067371      S/N:           ABDK7203
Assembly ID:   0x0c97          Assembly Version: 01.08
Date:          09-28-2016      Assembly Flags: 0x00
Version:       REV 08          CLEI Code:     PROTOXCLEI
ID: Switch Fabric Board      FRU Model Number: PROTO-ASSEMBLY

Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 fe 0c 97 01 08 52 45 56 20 30 38 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 36 37 33 37 31 00 00
  Address 0x20: 53 2f 4e 20 41 42 44 4b 37 32 30 33 00 1c 09 07
  Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
  Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff c2 07 00 00 00 00 00 00 00 06 00 48 00

SFB 7          REV 08    750-067371    ABDK7238          Switch Fabric Board
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-067371      S/N:           ABDK7238
Assembly ID:   0x0c97          Assembly Version: 01.08
Date:          09-27-2016      Assembly Flags: 0x00
Version:       REV 08          CLEI Code:     PROTOXCLEI
ID: Switch Fabric Board      FRU Model Number: PROTO-ASSEMBLY

Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 fe 0c 97 01 08 52 45 56 20 30 38 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 36 37 33 37 31 00 00
  Address 0x20: 53 2f 4e 20 41 42 44 4b 37 32 33 38 00 1b 09 07
  Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
  Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff c2 07 00 00 00 00 00 00 00 07 00 48 00

FPC 0          REV 36    750-044130    ABCS8607          MPC6E 3D
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-044130      S/N:           ABCS8607
Assembly ID:   0x0b86          Assembly Version: 01.36
Date:          10-29-2013      Assembly Flags: 0x00
Version:       REV 36          CLEI Code:     PROTOXCLEI

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ID: MPC6E 3D                                FRU Model Number:  PROTO-ASSEMBLY
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 fe 0b 86 01 24 52 45 56 20 33 36 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 34 34 31 33 30 00 00
Address 0x20: 53 2f 4e 20 41 42 43 53 38 36 30 37 00 1d 0a 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 ff ff ff ff ff ff ff ff ff ff ff ff
CPU                                REV 09    711-045719    ABCS8776    RMPC PMB
Jedec Code:  0x7fb0                EEPROM Version:  0x02
P/N:         711-045719            S/N:            ABCS8776
Assembly ID: 0x0b85                Assembly Version: 01.09
Date:        10-24-2013            Assembly Flags:  0x00
Version:     REV 09
ID: RMPC PMB
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 85 01 09 52 45 56 20 30 39 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 34 35 37 31 39 00 00
Address 0x20: 53 2f 4e 20 41 42 43 53 38 37 37 36 00 18 0a 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 00 00 00 00 16 47 1f b0 00 00 00 00
MIC 0                                REV 21    750-050008    ABCT5920    4X100GE CXP
Jedec Code:  0x7fb0                EEPROM Version:  0x02
P/N:         750-050008            S/N:            ABCT5920
Assembly ID: 0x0a83                Assembly Version: 01.21
Date:        09-29-2014            Assembly Flags:  0x00
Version:     REV 21                CLEI Code:      IP9IATYDAA
ID: 4X100GE CXP                    FRU Model Number: MIC6-100G-CXP
Board Information Record:
Address 0x00: 12 01 07 02 03 ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0a 83 01 15 52 45 56 20 32 31 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 30 30 30 38 00 00
Address 0x20: 53 2f 4e 20 41 42 43 54 35 39 32 30 00 1d 09 07
Address 0x30: de ff ff ff 12 01 07 02 03 ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 39 49 41 54 59 44 41 41 4d
Address 0x50: 49 43 36 2d 31 30 30 47 2d 43 58 50 00 00 00 00
Address 0x60: 00 00 00 00 00 00 41 41 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 74 00 00 00 00 10 09 73 3c c0 02 70 3c
PIC 0                                BUILTIN    BUILTIN    4X100GE CXP
XLM 0                                REV 07.2.00 711-046638 ABCK3488    MPC6E XL
Jedec Code:  0x7fb0                EEPROM Version:  0x02
P/N:         711-046638            S/N:            ABCK3488
Assembly ID: 0x0b88                Assembly Version: 01.07
Date:        11-11-2013            Assembly Flags:  0x00
Version:     REV 07.2.00
ID: MPC6E XL
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 88 01 07 52 45 56 20 30 37 2e 32

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Address 0x10: 2e 30 30 00 37 31 31 2d 30 34 36 36 33 38 00 00
Address 0x20: 53 2f 4e 20 41 42 43 4b 33 34 38 38 00 0b 0b 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 00 00 00 00 00 00 00 00 00 00 00 00
XLM 1          REV 07.2.00 711-046638 ABCK5482          MPC6E XL
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           711-046638      S/N:              ABCK5482
Assembly ID:   0x0b88          Assembly Version: 01.07
Date:          10-21-2013      Assembly Flags:  0x00
Version:       REV 07.2.00
ID: MPC6E XL
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 88 01 07 52 45 56 20 30 37 2e 32
Address 0x10: 2e 30 30 00 37 31 31 2d 30 34 36 36 33 38 00 00
Address 0x20: 53 2f 4e 20 41 42 43 4b 35 34 38 32 00 15 0a 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 50 52 4f 54 4f 58 43 4c 45 49 50
Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
Address 0x70: ff ff ff c2 00 00 00 00 00 00 00 00 00 00 00 00
FPC 1          REV 22      750-063414 CAFJ3026          MPC9E 3D
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           750-063414      S/N:              CAFJ3026
Assembly ID:   0x0c43          Assembly Version: 01.22
Date:          03-28-2016      Assembly Flags:  0x00
Version:       REV 22          CLEI Code:          IPUCBMUCAA
ID: MPC9E 3D          FRU Model Number: MX2K-MPC9E
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0c 43 01 16 52 45 56 20 32 32 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 36 33 34 31 34 00 00
Address 0x20: 53 2f 4e 20 43 41 46 4a 33 30 32 36 00 1c 03 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 43 42 4d 55 43 41 41 4d
Address 0x50: 58 32 4b 2d 4d 50 43 39 45 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 41 41 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff ff
CPU           REV 16      750-057177 CAFF9332          SMPC PMB
Jedec Code:    0x7fb0          EEPROM Version:    0x01
P/N:           750-057177      S/N:              CAFF9332
Assembly ID:   0x0c22          Assembly Version: 01.16
Date:          03-20-2016      Assembly Flags:  0x00
Version:       REV 16
ID: SMPC PMB
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 0c 22 01 10 52 45 56 20 31 36 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 35 37 31 37 37 00 00
Address 0x20: 53 2f 4e 20 43 41 46 46 39 33 33 32 00 14 03 07
Address 0x30: e0 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff

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Address 0x70: ff ff ff ff 00 00 00 00 38 f9 0d e0 4f d1 4b 08
FPC 7          REV 08      750-038492    ZX4080      MPCE Type 2 3D EQ
Jedec Code:    0x7fb0      EEPROM Version: 0x02
P/N:          750-038492    S/N:          ZX4080
Assembly ID:   0x0b35      Assembly Version: 01.08
Date:         02-03-2012    Assembly Flags: 0x00
Version:      REV 08      CLEI Code:    COUIBA5BAA
ID: MPCE Type 2 3D EQ      FRU Model Number: MX-MPC2E-3D-EQ

Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 35 01 08 52 45 56 20 30 38 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 33 38 34 39 32 00 00
Address 0x20: 53 2f 4e 20 5a 58 34 30 38 30 00 00 00 03 02 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 43 4f 55 49 42 41 35 42 41 41 4d
Address 0x50: 58 2d 4d 50 43 32 45 2d 33 44 2d 45 51 00 00 00
Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 74 ff ff ff ff ff ff ff ff ff ff ff ff
CPU          REV 03      711-038484    ZX3665      MPCE PMB 2G
Jedec Code:    0x7fb0      EEPROM Version: 0x01
P/N:          711-038484    S/N:          ZX3665
Assembly ID:   0x0b36      Assembly Version: 01.03
Date:         02-01-2012    Assembly Flags: 0x00
Version:      REV 03
ID: MPCE PMB 2G

Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 0b 36 01 03 52 45 56 20 30 33 00 00
Address 0x10: 00 00 00 00 37 31 31 2d 30 33 38 34 38 34 00 00
Address 0x20: 53 2f 4e 20 5a 58 33 36 36 35 00 00 00 01 02 07
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff ff 00 00 00 02 00 00 0c 00 42 5f c0 a4
MIC 0          REV 05      750-037128    ZR4031      1xCOC12/4xCOC3 CH-CE
Jedec Code:    0x7fb0      EEPROM Version: 0x02
P/N:          750-037128    S/N:          ZR4031
Assembly ID:   0x0a1b      Assembly Version: 01.05
Date:         12-04-2011    Assembly Flags: 0x00
Version:      REV 05      CLEI Code:    PROTOXCLEI
ID: 1xCOC12/4xCOC3 CH-CE    FRU Model Number: MIC-3D-4CHOC3-10C12-CE

Board Information Record:
Address 0x00: 12 01 05 03 05 ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0a 1b 01 05 52 45 56 20 30 35 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 33 37 31 32 38 00 00
Address 0x20: 53 2f 4e 20 5a 52 34 30 33 31 00 00 00 04 0c 07
Address 0x30: db ff ff ff 12 01 05 03 05 ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 4d
Address 0x50: 49 43 2d 33 44 2d 34 43 48 4f 43 33 2d 31 4f 43
Address 0x60: 31 32 2d 43 45 00 30 32 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 98 c0 02 61 bc 7f b0 02 ff 0a 11 01 17
PIC 0          BUILTIN    BUILTIN      1xCOC12/4xCOC3 CH-CE
MIC 1          REV 23      750-032479    CADE8614     MIC-3D-8DS3-E3
Jedec Code:    0x7fb0      EEPROM Version: 0x02
P/N:          750-032479    S/N:          CADE8614
Assembly ID:   0x0a11      Assembly Version: 01.23

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Date:          07-24-2014      Assembly Flags:  0x00
Version:       REV 23         CLEI Code:       COUIA8DBAA
ID: MIC-3D-8DS3-E3          FRU Model Number:  MIC-3D-8DS3-E3
Board Information Record:
  Address 0x00: 56 01 ff ff 03 ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0a 11 01 17 52 45 56 20 32 33 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 33 32 34 37 39 00 00
  Address 0x20: 53 2f 4e 20 43 41 44 45 38 36 31 34 00 18 07 07
  Address 0x30: de ff ff ff 56 01 ff ff 03 ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 43 4f 55 49 41 38 44 42 41 41 4d
  Address 0x50: 49 43 2d 33 44 2d 38 44 53 33 2d 45 33 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 41 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 7b c0 03 e5 7c 4f 8a 9e 10 00 00 00 02
PIC 2          BUILTIN      BUILTIN      MIC-3D-8DS3-E3
QXM 0          REV 06      711-028408    ZW8299      MPC QXM
Jedec Code:    0x7fb0      EEPROM Version:  0x01
P/N:          711-028408    S/N:            ZW8299
Assembly ID:   0x097a      Assembly Version: 02.06
Date:         01-19-2012    Assembly Flags:  0x00
Version:      REV 06
ID: MPC QXM
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 01 ff 09 7a 02 06 52 45 56 20 30 36 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 32 38 34 30 38 00 00
  Address 0x20: 53 2f 4e 20 5a 57 38 32 39 39 00 00 00 13 01 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
  Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
QXM 1          REV 06      711-028408    ZY0609      MPC QXM
Jedec Code:    0x7fb0      EEPROM Version:  0x01
P/N:          711-028408    S/N:            ZY0609
Assembly ID:   0x097a      Assembly Version: 02.06
Date:         01-19-2012    Assembly Flags:  0x00
Version:      REV 06
ID: MPC QXM
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 01 ff 09 7a 02 06 52 45 56 20 30 36 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 32 38 34 30 38 00 00
  Address 0x20: 53 2f 4e 20 5a 59 30 36 30 39 00 00 00 13 01 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
  Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
ADC 7          REV 17      750-043596    ABCA0990      Adapter Card
Jedec Code:    0x7fb0      EEPROM Version:  0x02
P/N:          750-043596    S/N:            ABCA0990
Assembly ID:   0x0b3d      Assembly Version: 01.17
Date:         03-07-2013    Assembly Flags:  0x00
Version:      REV 17         CLEI Code:       IPUCBA8CAA
ID: Adapter Card          FRU Model Number:  MX2000-LC-ADAPTER
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff

```

```

I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 3d 01 11 52 45 56 20 31 37 00 00
Address 0x10: 00 00 00 00 37 35 30 2d 30 34 33 35 39 36 00 00
Address 0x20: 53 2f 4e 20 41 42 43 41 30 39 39 30 00 07 03 07
Address 0x30: dd ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 43 42 41 38 43 41 41 4d
Address 0x50: 58 32 30 30 30 2d 4c 43 2d 41 44 41 50 54 45 52
Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
Address 0x70: ff ff ff 3a 00 00 00 00 00 00 00 00 00 00 00 00
Fan Tray 0      REV 01    760-052467    ACAY6190      172mm FanTray - 6 Fans
Jedec Code:    0x7fb0      EEPROM Version: 0x02
P/N:           760-052467    S/N:          ACAY6190
Assembly ID:   0x0b96      Assembly Version: 02.10
Date:          09-18-2015    Assembly Flags: 0x00
Version:       REV 01      CLEI Code:     IPUCBENCAA
ID: 172mm FanTray - 6 Fans    FRU Model Number: MX2000-FANTRAY-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 96 02 0a 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 36 30 2d 30 35 32 34 36 37 00 00
Address 0x20: 53 2f 4e 20 41 43 41 59 36 31 39 30 00 12 09 07
Address 0x30: df ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 43 42 45 4e 43 41 41 4d
Address 0x50: 58 32 30 30 30 2d 46 41 4e 54 52 41 59 2d 53 00
Address 0x60: 00 00 00 00 00 00 31 ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff 1a ff ff ff ff ff ff ff ff ff ff ff ff
Fan Tray 1      REV 01    760-052467    ACAY6414      172mm FanTray - 6 Fans
Jedec Code:    0x7fb0      EEPROM Version: 0x02
P/N:           760-052467    S/N:          ACAY6414
Assembly ID:   0x0b96      Assembly Version: 02.10
Date:          10-28-2015    Assembly Flags: 0x00
Version:       REV 01      CLEI Code:     IPUCBENCAA
ID: 172mm FanTray - 6 Fans    FRU Model Number: MX2000-FANTRAY-S
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 0b 96 02 0a 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 36 30 2d 30 35 32 34 36 37 00 00
Address 0x20: 53 2f 4e 20 41 43 41 59 36 34 31 34 00 1c 0a 07
Address 0x30: df ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 49 50 55 43 42 45 4e 43 41 41 4d
Address 0x50: 58 32 30 30 30 2d 46 41 4e 54 52 41 59 2d 53 00
Address 0x60: 00 00 00 00 00 00 31 ff ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff 1a ff ff ff ff ff ff ff ff ff ff ff ff

```

### show chassis hardware models (MX2008 Router)

```
user@host>show chassis hardware models
```

Hardware inventory:

Item	Version	Part number	Serial number	FRU model number
Midplane	REV 47	750-044636	ABAD1739	CHAS-BP-MX2010-S
PMP	REV 01	711-051406	ACVD0738	
FPM Board	REV 02	760-068193	ABDG7408	PROTO-ASSEMBLY
PSM 1	REV 06	740-050037	1EDB61200R8	MX2000-PSM-DC-S
PSM 2	REV 06	740-050037	1EDB61200WA	MX2000-PSM-DC-S
PSM 3	REV 06	740-050037	1EDB61200NY	MX2000-PSM-DC-S
PSM 4	REV 06	740-050037	1EDB61200N2	MX2000-PSM-DC-S
PSM 5	REV 06	740-050037	1EDB61200RN	MX2000-PSM-DC-S

PSM 6	REV 06	740-050037	1EDB61200RF	MX2000-PSM-DC-S
PSM 7	REV 06	740-050037	1EDB61200R7	MX2000-PSM-DC-S
PDM 0	REV 01	740-060189	1EFF5250143	MX2K-PDM-OP-DC-S
PDM 1	REV 01	740-060189	1EFF5250074	MX2K-PDM-OP-DC-S
CB 0	REV 01	750-067373	ABDJ0047	PROTO-ASSEMBLY
CB 1	REV 03	750-067373	ABDH3016	PROTO-ASSEMBLY
SFB 0	REV 08	750-067371	ABDK7180	PROTO-ASSEMBLY
SFB 1	REV 08	750-067371	ABDK7024	PROTO-ASSEMBLY
SFB 2	REV 08	750-067371	ABDK7188	PROTO-ASSEMBLY
SFB 3	REV 08	750-067371	ABDK7143	PROTO-ASSEMBLY
SFB 4	REV 08	750-067371	ABDK7030	PROTO-ASSEMBLY
SFB 5	REV 08	750-067371	ABDK7146	PROTO-ASSEMBLY
SFB 6	REV 08	750-067371	ABDK7203	PROTO-ASSEMBLY
SFB 7	REV 08	750-067371	ABDK7238	PROTO-ASSEMBLY
FPC 0	REV 36	750-044130	ABCS8607	PROTO-ASSEMBLY
MIC 0	REV 21	750-050008	ABCT5920	MIC6-100G-CXP
FPC 1	REV 22	750-063414	CAFJ3026	MX2K-MPC9E
FPC 7	REV 08	750-038492	ZX4080	MX-MPC2E-3D-EQ
MIC 0	REV 05	750-037128	ZR4031	MIC-3D-4CH0C3-10C12-CE
MIC 1	REV 23	750-032479	CADE8614	MIC-3D-8DS3-E3
ADC 7	REV 17	750-043596	ABCA0990	MX2000-LC-ADAPTER
Fan Tray 0	REV 01	760-052467	ACAY6190	MX2000-FANTRAY-S
Fan Tray 1	REV 01	760-052467	ACAY6414	MX2000-FANTRAY-S

### show chassis hardware clei-models (MX2008 Router)

```
user@host>show chassis hardware clei-models
```

Hardware inventory:

Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 47	750-044636	IPMU810ARB	CHAS-BP-MX2010-S
PMP	REV 01	711-051406		
FPM Board	REV 02	760-068193	PROTOXCLEI	PROTO-ASSEMBLY
PSM 1	REV 06	740-050037	IPUPAPDKAA	MX2000-PSM-DC-S
PSM 2	REV 06	740-050037	IPUPAPDKAA	MX2000-PSM-DC-S
PSM 3	REV 06	740-050037	IPUPAPDKAA	MX2000-PSM-DC-S
PSM 4	REV 06	740-050037	IPUPAPDKAA	MX2000-PSM-DC-S
PSM 5	REV 06	740-050037	IPUPAPDKAA	MX2000-PSM-DC-S
PSM 6	REV 06	740-050037	IPUPAPDKAA	MX2000-PSM-DC-S
PSM 7	REV 06	740-050037	IPUPAPDKAA	MX2000-PSM-DC-S
PDM 0	REV 01	740-060189	IPUPAN1KAA	MX2K-PDM-OP-DC-S
PDM 1	REV 01	740-060189	IPUPAN1KAA	MX2K-PDM-OP-DC-S
CB 0	REV 01	750-067373	PROTOXCLEI	PROTO-ASSEMBLY
CB 1	REV 03	750-067373	PROTOXCLEI	PROTO-ASSEMBLY
SFB 0	REV 08	750-067371	PROTOXCLEI	PROTO-ASSEMBLY
SFB 1	REV 08	750-067371	PROTOXCLEI	PROTO-ASSEMBLY
SFB 2	REV 08	750-067371	PROTOXCLEI	PROTO-ASSEMBLY
SFB 3	REV 08	750-067371	PROTOXCLEI	PROTO-ASSEMBLY
SFB 4	REV 08	750-067371	PROTOXCLEI	PROTO-ASSEMBLY
SFB 5	REV 08	750-067371	PROTOXCLEI	PROTO-ASSEMBLY
SFB 6	REV 08	750-067371	PROTOXCLEI	PROTO-ASSEMBLY
SFB 7	REV 08	750-067371	PROTOXCLEI	PROTO-ASSEMBLY
FPC 0	REV 36	750-044130	PROTOXCLEI	PROTO-ASSEMBLY
MIC 0	REV 21	750-050008	IP9IATYDAA	MIC6-100G-CXP
FPC 1	REV 22	750-063414	IPUCBMUCAA	MX2K-MPC9E
FPC 7	REV 08	750-038492	COUIBA5BAA	MX-MPC2E-3D-EQ
MIC 0	REV 05	750-037128	PROTOXCLEI	MIC-3D-4CH0C3-10C12-CE
MIC 1	REV 23	750-032479	COUIA8DBAA	MIC-3D-8DS3-E3
ADC 7	REV 17	750-043596	IPUCBA8CAA	MX2000-LC-ADAPTER

Fan Tray 0	REV 01	760-052467	IPUCBENCAA	MX2000-FANTRAY-S
Fan Tray 1	REV 01	760-052467	IPUCBENCAA	MX2000-FANTRAY-S

### show chassis hardware (MX10003 Router)

```
user@host> show chassis hardware
```

Hardware inventory:				
Item	Version	Part number	Serial number	Description
Chassis			BLANK	JNP10003 [MX10003]
Midplane	REV 01	750-066883	CAGM0759	Midplane 2
Routing Engine 0		BUILTIN	BUILTIN	Routing Engine
Routing Engine 1		BUILTIN	BUILTIN	Routing Engine
CB 0	REV 07	750-067071	CAGX4354	SPM
Mezz	REV 10	711-066896	CAHS7200	SPM Mezz Board
CB 1	REV 07	750-067071	CAGX4363	SPM
Mezz	REV 10	711-066896	CAHS7193	SPM Mezz Board
FPC 0	REV 05	750-066879	CAGV0273	LC2103
CPU		BUILTIN	BUILTIN	SMPC PMB
PIC 0				
PIC 1				
FPC 1	REV 05	750-066879	CAGV0278	LC2103
CPU		BUILTIN	BUILTIN	SMPC PMB
PIC 0		BUILTIN	BUILTIN	6xQSFP
PIC 1				
PEM 0	REV 01	740-066937	1HS16320003	JNP-PWR1600-AC
PEM 1	REV 01	740-066937	1HS16320002	JNP-PWR1600-AC
Fan Tray 0	REV 02	760-069329	CAGS7731	JNP FAN 3RU
Fan Tray 1	REV 02	760-069329	CAGS7776	JNP FAN 3RU
Fan Tray 2	REV 02	760-069329	CAGS7659	JNP FAN 3RU
Fan Tray 3	REV 02	760-069329	CAGS7669	JNP FAN 3RU

### show chassis hardware (MX204 Router)

```
user@host> show chassis hardware
```

Hardware inventory:				
Item	Version	Part number	Serial number	Description
Chassis			BB768	JNP204 [MX204]
Routing Engine 0		BUILTIN	BUILTIN	RE-S-2X00x6
CB 0	REV 11	750-069579	CAJD3113	JNP204 [MX204]
FPC 0		BUILTIN	BUILTIN	MPC
PIC 0		BUILTIN	BUILTIN	4XSFP28 PIC
Xcvr 0	REV 01	740-061405	1ACQ110409R	QSFP-100GBASE-SR4
Xcvr 1	REV 01	740-054053	QF027546	QSFP+-4X10G-SR
Xcvr 2	REV 01	740-058732	1AMQA142092	QSFP-100GBASE-LR4
Xcvr 3	REV 01	740-058732	1AMQA14203J	QSFP-100GBASE-LR4
PIC 1		BUILTIN	BUILTIN	8XSFP PIC
PEM 1	REV 04	740-043886	1GA46361256	JPSU-650W-DC-AFO
Fan Tray 0				Fan Tray, Front to Back
Airflow - AFO				
Fan Tray 1				Fan Tray, Front to Back
Airflow - AFO				
Fan Tray 2				Fan Tray, Front to Back
Airflow - AFO				



**show chassis hardware (vMX running in lite mode)**

```
user@host> show chassis hardware
```

```
Hardware inventory:
```

Item	Version	Part number	Serial number	Description
Chassis			VM54599D128A	VMX
Midplane				
Routing Engine 0				RE-VMX
CB 0				VMX SCB
CB 1				VMX SCB
FPC 0				Virtual FPC
CPU	Rev. 1.0	RIOT-LITE	BUILTIN	
MIC 0				Virtual
PIC 0		BUILTIN	BUILTIN	Virtual

**show chassis hardware (vMX running in performance mode)**

```
user@host> show chassis hardware
```

```
Hardware inventory:
```

Item	Version	Part number	Serial number	Description
Chassis			VM54599D128A	VMX
Midplane				
Routing Engine 0				RE-VMX
CB 0				VMX SCB
CB 1				VMX SCB
FPC 0				Virtual FPC
CPU	Rev. 1.0	RIOT-PERF	BUILTIN	
MIC 0				Virtual
PIC 0		BUILTIN	BUILTIN	Virtual

**show chassis hardware (T320 Router)**

```
user@host> show chassis hardware
```

```
Hardware inventory:
```

Item	Version	Part number	Serial number	Description
Chassis			19093	T320
Midplane	REV 04	710-004339	BC1436	T320 Backplane
FPM GBUS	REV 03	710-004461	BC1407	T320 FPM Board
FPM Display	REV 04	710-002897	BE0763	FPM Display
CIP	REV 05	710-002895	BB2311	T Series CIP
PEM 0	Rev 01	740-004359	NB12546	Power Entry Module
SCG 0	REV 06	710-004455	AY4522	T320 Sonet
Clock Gen.				
Routing Engine 0				unknown
CB 0	REV 13	710-002728	BC1577	T Series
Control Board				
CB 1	REV 13	710-002728	BC1595	T Series
Control Board				
FPC 1	REV 09	710-007531	HS1572	FPC Type 2
CPU	REV 15	710-001726	HR8763	FPC CPU
PIC 0	REV 01	750-010618	CB5579	4x G/E SFP,
1000 BASE				
SFP 0	REV 01	740-007326	P5809Z1	SFP-SX
SFP 1	REV 01	740-007326	P4Q10XU	SFP-SX
SFP 2		NON-JNPR	RA45020031	SFP-SX
SFP 3		NON-JNPR	RA45020032	SFP-SX
PIC 1	REV 01	750-010618	CD9587	4x G/E SFP,

1000 BASE					
SFP 0			NON-JNPR	P5A08QZ	SFP-T
SFP 1	REV 01	740-007326		P4Q133K	SFP-SX
SFP 2	REV 01	740-007326		P5809YY	SFP-SX
SFP 3	REV 01	740-007327		4C81704	SFP-LX
MMB 1	REV 03	710-005555		HR9401	MMB-288mbit
PPB 0	REV 04	710-003758		HR2886	PPB Type 2
FPC 2	REV 07	710-005860		HP2392	FPC Type 1
CPU	REV 14	710-001726		HP7797	FPC CPU
PIC 0	REV 02	750-007643		HM0853	1x G/E QPP,
1000 BASE					
SFP 0	REV 01	740-007326		P11E9JJ	SFP-SX
MMB 1	REV 02	710-005555		HN2379	MMB-288mbit
PPB 0	REV 04	710-003758		HP8092	PPB Type 2
FPC 3	REV 07	710-005860		HP2393	FPC Type 1
CPU	REV 14	710-001726		HP0968	FPC CPU
PIC 0	REV 01	750-010240		CB5363	1x G/E SFP,
1000 BASE					
SFP 0	REV 01	740-007326		P4R0PNH	SFP-SX
PIC 1	REV 03	750-003034		HD2832	4x OC-3 SONET,
SMIR					
MMB 1	REV 02	710-005555		HN6307	MMB-288mbit
PPB 0	REV 04	710-003758		HP5051	PPB Type 2
FPC 4	REV 01	710-010845		JD3872	FPC Type 4
CPU	REV 02	710-011481		JB6042	FPC CPU
5	REV 01	710-005802		BC1566	FPC Type 2
CPU	REV 09	710-001726		AY4922	FPC CPU
PIC 0	REV 02	750-008155		BE2114	2x G/E QPP,
1000 BASE					
SFP 0	REV 01	740-007326		P4R0PMQ	SFP-SX
SFP 1	REV 01	740-007326		P4R0PN9	SFP-SX
PIC 1	REV 01	750-008155		BE2116	2x G/E QPP,
1000 BASE					
SFP 0	REV 01	740-007326		P4R0PNZ	SFP-SX
SFP 1		NON-JNPR		2908	SFP-T
MMB 1	REV 01	710-005555		AZ2246	MMB-288mbit
PPB 0	REV 03	710-003758		AY4839	PPB Type 2
FPC 7	REV 01	710-005803		AZ2123	FPC Type 3
...					

**show chassis hardware (T640 Router)**

```
user@host> show chassis hardware
```

Hardware inventory:				
Item	Version	Part number	Serial number	Description
Chassis			19182	T640
Midplane	REV 04	710-002726	AX5608	T640 Backplane
FPM GBUS	REV 02	710-002901	HE3064	T640 FPM Board
FPM Display	REV 02	710-002897	HE7864	FPM Display
CIP	REV 05	710-002895	HA5024	T Series CIP
PEM 0	Rev 02	740-029522	VH26235	AC PEM 10kW US
PEM 1	Rev 02	740-029522	VH26230	AC PEM 10kW US
SCG 0	REV 03	710-003423	HA4508	T640 Sonet Clock Gen.
Routing Engine 0	REV 02	740-005022	210865700483	RE-3.0 (RE-600)
CB 0	REV 01	710-002728	HD3044	T Series Control Board
FPC 2	REV 04	710-001721	HD5572	FPC Type 3
CPU	REV 06	710-001726	HA4712	FPC CPU
PIC 1	REV 03	750-009567	HV2331	1x 10GE(LAN),XENPAK
SFP 0	REV 01	740-009898	USC202R103	XENPAK-SR

PIC 2	REV 03	750-009567	HV2332	1x 10GE(LAN),XENPAK
SFP 0	REV 01	740-011268	USC202R112	XENPAK-ZR
PIC 3	REV 03	750-009567	HX4416	1x 10GE(LAN),XENPAK
SFP 0	REV 01	740-012056	434TC004	XENPAK-CX4
PIC 4	REV 03	750-009567	HX4420	1x 10GE(LAN),XENPAK
SFP 0	REV 01	740-012058	434TC124	XENPAK-LX4
FPC 5	REV 01	710-013553	JE4839	E2-FPC Type 1
CPU	REV 01	710-013569	JW9163	FPC CPU
PIC 0	REV 01	750-009567	HX4419	1x 10GE(LAN),XENPAK
SFP 0	REV 01	740-009898	USC202RT05	XENPAK-LR
PIC 1	REV 03	750-009567	HN7426	1x 10GE(LAN),XENPAK
SFP 0	REV 01	740-009550	03L90051	XENPAK-ER
PIC 2	REV 03	750-009467	HT7423	1x 10GE(LAN),XENPAK
SFP 0		NON-JNPR		UNKNOWN
PIC 3	REV 04	750-005100	AY4850	1x 10GE(LAN),DWDM
FPC 4	REV 01	710-010845	JD3872	FPC Type 4
CPU	REV 02	710-011481	JB6042	FPC CPU
Fan Tray 0				Front Top Fan Tray
Fan Tray 1				Front Bottom Fan Tray
Fan Tray 2				Rear Fan Tray

#### show chassis hardware models (T640 Router)

```
user@host> show chassis hardware models
```

Hardware inventory:

Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 04	710-002726		CHAS-BP-T640-S
FPM Display	REV 02	710-002897		CRAFT-T640-S
CIP	REV 05	710-002895		CIP-L-T640-S
PEM 0	Rev 01	740-002595		PWR-T-DC-S
SCG 0	REV 04	710-003423		SCG-T-S
SCG 1	REV 04	710-003423		SCG-T-S
Routing Engine 0	REV 01	740-005022		RE-600-2048-S
Routing Engine 1	REV 07	740-005022		RE-600-2048-S
CB 0	REV 06	710-002726		CHAS-BP-T640-S
CB 1	REV 06	710-002728		CB-L-T-S
FPC 5	REV 05	710-007527		T640-FPC2
PIC 0	REV 05	750-002510		PB-2GE-SX
PIC 1	REV 05	750-001901		PB-40C12-SON-SMIR
FPC 6	REV 03	710-001721		T640-FPC3
PIC 1	REV 01	750-009553		PC-40C48-SON-SFP
SIB 4	REV 02	750-005486		SIB-I-T640-S
Fan Tray 0				FANTRAY-T-S
Fan Tray 1				FANTRAY-T-S
Fan Tray 2				FAN-REAR-TX-T640-S

#### show chassis hardware extensive (T640 Router)

```
user@host> show chassis hardware extensive
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis				T640
Jedec Code:	0x7fb0	EEPROM Version:	0x01	
P/N:	.....	S/N:	.....	
Assembly ID:	0x0507	Assembly Version:	00.00	
Date:	00-00-0000	Assembly Flags:	0x00	
Version:	.....			

```

ID: Gibson LCC Chassis
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 7f b0 01 ff 05 07 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x20: ff ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane          REV 04    710-002726    AX5633
Jedec Code:      0x7fb0          EEPROM Version:    0x01
P/N:             710-002726.      S/N:             AX5633.
Assembly ID:     0x0127          Assembly Version: 01.04
Date:            06-27-2001      Assembly Flags:   0x00
Version:         REV 04.....
ID: Gibson Backplane
Board Information Record:
Address 0x00: ad 01 08 00 00 90 69 0e f8 00 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 01 ff 01 27 01 04 52 45 56 20 30 34 00 00
Address 0x10: 00 00 00 00 37 31 30 2d 30 30 32 37 32 36 00 00
Address 0x20: 53 2f 4e 20 41 58 35 36 33 33 00 00 00 1b 06 07
Address 0x30: d1 ff ff ff ad 01 08 00 00 90 69 0e f8 00 ff ff
Address 0x40: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM GBUS          REV 02    710-002901    HE3245
...
FPM Display       REV 02    710-002897    HA4873
...
CIP               REV 05    710-002895    HA4729
...
PEM 1             RevX02    740-002595    MD21815          Power Entry Module
...
SCG 0             REV 04    710-003423    HF6023
...
SCG 1             REV 04    710-003423    HF6061
...
Routing Engine 0  REV 01    740-005022    210865700292    RE-3.0
...
CB 0              REV 06    710-002728    HE3614
...
FPC 1             REV 01    710-002385    HE3009          FPC Type 1
...
                  REV 06    710-001726    HC0010

```

### show chassis hardware (T4000 Router)

```
user@host> show chassis hardware
```

```

Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis                               JN1172F25AHA  T4000
Midplane      REV 01    710-027486   RC8355         T-series Backplane
FPM GBUS      REV 13    710-002901   BBAE0927       T640 FPM Board
FPM Display   REV 01    710-021387   EF6764         T1600 FPM Display
CIP           REV 06    710-002895   BBAD9210       T-series CIP
PEM 0         REV 01    740-036442   VA00016        Power Entry Module 6x60
SCG 0         REV 18    710-003423   BBAD7248       T640 Sonet Clock Gen.
SCG 1         REV 18    710-003423   BBAE3874       T640 Sonet Clock Gen.
Routing Engine 0 REV 05    740-026941   P737F-002248   RE-DUO-1800
Routing Engine 1 REV 06    740-026941   P737F-002653   RE-DUO-1800
CB 0          REV 09    710-022597   ED0295         LCC Control Board

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CB 1	REV 09	710-022597	EA6050	LCC Control Board
FPC 0	REV 26	750-032819	EK1173	FPC Type 5-3D
CPU	REV 12	711-030686	EJ8584	SNG PMB
PIC 0	REV 07	750-034624	EF6837	12x10GE (LAN/WAN) SFPP
Xcvr 0	REV 01	740-031980	123363A01145	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	123363A01147	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AJJ01P3	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B10M03256	SFP+-10G-SR
Xcvr 4	REV 01	740-031980	AJJ01M2	SFP+-10G-SR
Xcvr 5	REV 01	740-031980	123363A01137	SFP+-10G-SR
Xcvr 6	REV 01	740-031980	AJJ01PN	SFP+-10G-SR
Xcvr 7	REV 01	740-031980	AJJ01NW	SFP+-10G-SR
Xcvr 8	REV 01	740-031980	123363A01139	SFP+-10G-SR
Xcvr 9	REV 01	740-031980	AJJ01KE	SFP+-10G-SR
Xcvr 10	REV 01	740-031980	123363A01336	SFP+-10G-SR
Xcvr 11	REV 01	740-031980	B10M01325	SFP+-10G-SR
PIC 1	REV 07	750-034624	EF6800	12x10GE (LAN/WAN) SFPP
Xcvr 0	REV 01	740-031980	AJJ01SA	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AJJ01QZ	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AJH0217	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AJJ01TE	SFP+-10G-SR
Xcvr 4	REV 01	740-031980	AJJ01KV	SFP+-10G-SR
Xcvr 5	REV 01	740-031980	AJJ01MU	SFP+-10G-SR
Xcvr 6	REV 01	740-031980	AJJ01R0	SFP+-10G-SR
Xcvr 7	REV 01	740-031980	AJJ01TC	SFP+-10G-SR
Xcvr 8	REV 01	740-031980	AJJ0364	SFP+-10G-SR
Xcvr 9	REV 01	740-031980	AJD0GV3	SFP+-10G-SR
Xcvr 10	REV 01	740-031980	B10M03343	SFP+-10G-SR
Xcvr 11	REV 01	740-031980	AJJ01QJ	SFP+-10G-SR
LMB 0	REV 05	711-034381	EJ8490	Type-0 LMB
LMB 1	REV 04	711-035774	EJ8517	Type-1 LMB
LMB 2	REV 05	711-034381	EJ8489	Type-0 LMB
FPC 3	REV 07	750-032819	EG3637	FPC Type 5-3D
CPU	REV 09	711-030686	EG0150	SNG PMB
PIC 0	REV 08	750-035293	EF3657	1x100GE
Xcvr 0	REV 01	740-032210	C22CQNJ	CFP-100G-LR4
PIC 1	REV 10	750-034624	BBAN4098	12x10GE (LAN/WAN) SFPP
Xcvr 0	REV 01	740-031980	B11J04902	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11J04891	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AJJ01MX	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B11J04183	SFP+-10G-SR
Xcvr 4	REV 01	740-031980	B11J04894	SFP+-10G-SR
Xcvr 5	REV 01	740-031980	B11J04184	SFP+-10G-SR
Xcvr 6	REV 01	740-031980	B11J04897	SFP+-10G-SR
Xcvr 7	REV 01	740-031980	B11J04899	SFP+-10G-SR
Xcvr 8	REV 01	740-031980	AJJ01TV	SFP+-10G-SR
Xcvr 9	REV 01	740-031980	B11J04057	SFP+-10G-SR
Xcvr 10	REV 01	740-031980	AJJ01M4	SFP+-10G-SR
Xcvr 11	REV 01	740-031980	B11J04905	SFP+-10G-SR
LMB 0	REV 04	711-034381	EG1524	Type-0 LMB
LMB 1	REV 03	711-035774	EG0345	Type-1 LMB
LMB 2	REV 04	711-034381	EG1522	Type-0 LMB
FPC 5	REV 03	710-033871	BBAJ0768	FPC Type 4-ES
CPU	REV 11	710-016744	BBAH9342	ST-PMB2
PIC 0	REV 09	750-029262	EE6789	100GE
PIC 1	REV 03	750-034781	EE6655	100GE CFP
Xcvr 0	REV 01	740-032210	J11A22334	CFP-100G-LR4
BRIDGE 0	REV 03	711-029995	EE6572	100GE Bridge Board
MMB 0	REV 07	710-025563	BBAJ4657	ST-MMB2
MMB 1	REV 07	710-025563	BBAJ3073	ST-MMB2

FPC 6	REV 05	750-010153	EF4936	FPC Type 5-3D
CPU	REV 06	711-030686	EF4189	SNG PMB
PIC 0	REV 10	750-034624	BBAN4109	12x10GE (LAN/WAN) SFPP
Xcvr 0	REV 01	740-031980	B11J04895	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11J04898	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B11J04021	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B11J04903	SFP+-10G-SR
Xcvr 4	REV 01	740-031980	B11J04311	SFP+-10G-SR
Xcvr 5	REV 01	740-031980	B11J04059	SFP+-10G-SR
Xcvr 6	REV 01	740-031980	B11J04016	SFP+-10G-SR
Xcvr 7	REV 01	740-031980	B11J04017	SFP+-10G-SR
Xcvr 8	REV 01	740-031980	B11J04887	SFP+-10G-SR
Xcvr 9	REV 01	740-031980	B11J04297	SFP+-10G-SR
Xcvr 10	REV 01	740-031980	B11J04893	SFP+-10G-SR
Xcvr 11	REV 01	740-031980	B11J04022	SFP+-10G-SR
PIC 1	REV 02	750-034624	EE3711	12x10GE (LAN/WAN) SFPP
Xcvr 0	REV 01	740-031980	AJH033X	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AJJ01N0	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AJJ01SV	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AJJ032L	SFP+-10G-SR
Xcvr 4	REV 01	740-031980	B10M01593	SFP+-10G-SR
Xcvr 5	REV 01	740-031980	AJD0FF1	SFP+-10G-SR
Xcvr 6	REV 01	740-031980	AJJ01NU	SFP+-10G-SR
Xcvr 7	REV 01	740-031980	123363A01305	SFP+-10G-SR
Xcvr 8	REV 01	740-031980	B10M00361	SFP+-10G-SR
Xcvr 9	REV 01	740-031980	AJJ01M7	SFP+-10G-SR
Xcvr 10	REV 01	740-031980	AJJ032X	SFP+-10G-SR
Xcvr 11	REV 01	740-031980	AJJ01PG	SFP+-10G-SR
LMB 0	REV 04	711-034381	EF3838	Type-0 LMB
LMB 1	REV 03	711-035774	EF3821	Type-1 LMB
LMB 2	REV 04	711-034381	EF3834	Type-0 LMB
SPMB 0	REV 05	710-023321	ED1990	LCC Switch CPU
SPMB 1	REV 05	710-023321	EA2768	LCC Switch CPU
SIB 0	REV 02	711-036340	EF8802	SIB-HC-3D
SIB 1	REV 07	711-036340	EG2286	SIB-HC-3D
SIB 2	REV 07	711-036340	EG2252	SIB-HC-3D
SIB 3	REV 02	711-036340	EF1358	SIB-HC-3D
SIB 4	REV 02	711-036340	EF8806	SIB-HC-3D
Fan Tray 0				Front Top Fan Tray
Fan Tray 1				Front Bottom Fan Tray
-- Rev 2				
Fan Tray 2				Rear Fan Tray -- Rev 3

### show chassis hardware (T4000 Router with 16-GB Line Card Chassis (LCC) Routing Engine)

```
user@host> show chassis hardware
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN11BDF2CAHA	T1600
Midplane	REV 01	710-027486	ACAJ0774	T640 Backplane
FPM GBUS	REV 13	710-002901	BBAL6812	T640 FPM Board
FPM Display	REV 04	710-021387	BBAP2679	T1600 FPM Display
CIP	REV 06	710-002895	BBAP4758	T-series CIP
PEM 0	Rev 03	740-026384	XF86421	Power Entry Module 3x80
PEM 1	Rev 03	740-026384	XF86429	Power Entry Module 3x80
SCG 0	REV 18	710-003423	BBAP1896	T640 Sonet Clock Gen.
SCG 1	REV 18	710-003423	BBAN8659	T640 Sonet Clock Gen.
Routing Engine 0	REV 01	740-042243	737F-002238	RE-DUO-1800-16G
Routing Engine 1	REV 01	740-042243	737F-002403	RE-DUO-1800-16G

CB 1	REV 11	710-022597	EK4526	LCC Control Board
CB 1	REV 11	710-022597	EK4527	LCC Control Board
FPC 0	REV 05	710-033871	EK5644	FPC Type 4-ES
CPU	REV 11	710-016744	EK3428	ST-PMB2
PIC 0	REV 20	750-017405	EJ3041	4x 10GE (LAN/WAN) XFP
PIC 1	REV 17	750-026962	EH7536	10x10GE (LAN/WAN) SFPP
MMB 0	REV 07	710-025563	EK6039	ST-MMB2
MMB 1	REV 07	710-025563	EK6086	ST-MMB2
FPC 1	REV 05	710-033871	EK6583	FPC Type 4-ES
CPU	REV 11	710-016744	EK3401	ST-PMB2
PIC 0	REV 17	750-026962	EJ8948	10x10GE (LAN/WAN) SFPP
MMB 0	REV 07	710-025563	EK6202	ST-MMB2
MMB 1	REV 07	710-025563	EK6112	ST-MMB2
SPMB 1	REV 05	710-023321	EK4900	LCC Switch CPU
SIB 0	REV 11	710-013074	EK5958	SIB-I8-SF
SIB 1	REV 11	710-013074	EK4606	SIB-I8-SF
SIB 2	REV 11	710-013074	EK5971	SIB-I8-SF
SIB 3	REV 11	710-013074	EK4609	SIB-I8-SF
SIB 4	REV 11	710-013074	EK4602	SIB-I8-SF
Fan Tray 0				Front Top Fan Tray
Fan Tray 1				Front Bottom Fan Tray
Fan Tray 2				Rear Fan Tray -- Rev 2

#### show chassis hardware (T4000 Router with LSR FPC)

```
user@host> show chassis hardware
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN1173A24AHA	T4000
FPC 3	REV	750-048373	AN7797	FPC Type 5-LSR
CPU	REV 10	711-030686	AN6649	SNG PMB
PIC 0	REV 07	750-034624	EF6830	12x10GE (LAN/WAN) SFPP

#### show chassis hardware clei-models (T4000 Router)

```
user@host> show chassis hardware clei-models
```

Hardware inventory:

Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 01	710-027486	IPMJ700DRD	CHAS-BP-T1600-S
FPM Display	REV 01	710-021387		CRAFT-T1600-S
CIP	REV 06	710-002895		CIP-L-T640-S
PEM 0	REV 01	740-036442	IPUPAG6KAA	PWR-T-6-60-DC
SCG 0	REV 18	710-003423		SCG-T-S
SCG 1	REV 18	710-003423		SCG-T-S
Routing Engine 0	REV 05	740-026941		RE-DU0-C1800-8G-S
Routing Engine 1	REV 06	740-026941		RE-DU0-C1800-8G-S
CB 0	REV 09	710-022597		CB-LCC-S
CB 1	REV 09	710-022597		CB-LCC-S
FPC 3				
PIC 0	REV 08	750-035293	XXXXXXXXBB	PF-1CGE-CFP
PIC 1	REV 10	750-034624	XXXXXXXXCC	PF-12XGE-SFPP
FPC 5	REV 03	710-033871	IPUCAMBCTD	T1600-FPC4-ES
PIC 1	REV 03	750-034781	IPUIBKLMMA	PD-1CE-CFP-FPC4
FPC 6				
PIC 0	REV 10	750-034624	XXXXXXXXCC	PF-12XGE-SFPP
Fan Tray 0				FANTRAY-T-S

Fan Tray 1	FANTRAY-T4000-S
Fan Tray 2	FANTRAY-TXP-R-S

### show chassis hardware detail (T4000 Router)

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user@host> show chassis hardware detail
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN1172F25AHA	T4000
Midplane	REV 01	710-027486	RC8355	T-series Backplane
FPM GBUS	REV 13	710-002901	BBAE0927	T640 FPM Board
FPM Display	REV 01	710-021387	EF6764	T1600 FPM Display
CIP	REV 06	710-002895	BBAD9210	T-series CIP
PEM 0	REV 01	740-036442	VA00016	Power Entry Module 6x60
SCG 0	REV 18	710-003423	BBAD7248	T640 Sonet Clock Gen.
SCG 1	REV 18	710-003423	BBAE3874	T640 Sonet Clock Gen.
Routing Engine 0	REV 05	740-026941	P737F-002248	RE-DUO-1800
ad0	3823 MB	SMART CF	2009121602A661576157	Compact Flash
ad1	59690 MB	STEC MACH-8 SSD	STM000103FDB	Disk 1
Routing Engine 1	REV 06	740-026941	P737F-002653	RE-DUO-1800
ad0	3823 MB	SMART CF	201011150153F52CF52C	Compact Flash
ad1	62720 MB	SMART Lite SATA Drive	2010110900150A880A88	Disk 1
CB 0	REV 09	710-022597	ED0295	LCC Control Board
CB 1	REV 09	710-022597	EA6050	LCC Control Board
FPC 0	REV 26	750-032819	EK1173	FPC Type 5-3D
CPU	REV 12	711-030686	EJ8584	SNG PMB
PIC 0	REV 07	750-034624	EF6837	12x10GE (LAN/WAN) SFPP
Xcvr 0	REV 01	740-031980	123363A01145	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	123363A01147	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AJJ01P3	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B10M03256	SFP+-10G-SR
Xcvr 4	REV 01	740-031980	AJJ01M2	SFP+-10G-SR
Xcvr 5	REV 01	740-031980	123363A01137	SFP+-10G-SR
Xcvr 6	REV 01	740-031980	AJJ01PN	SFP+-10G-SR
Xcvr 7	REV 01	740-031980	AJJ01NW	SFP+-10G-SR
Xcvr 8	REV 01	740-031980	123363A01139	SFP+-10G-SR
Xcvr 9	REV 01	740-031980	AJJ01KE	SFP+-10G-SR
Xcvr 10	REV 01	740-031980	123363A01336	SFP+-10G-SR
Xcvr 11	REV 01	740-031980	B10M01325	SFP+-10G-SR
PIC 1	REV 07	750-034624	EF6800	12x10GE (LAN/WAN) SFPP
Xcvr 0	REV 01	740-031980	AJJ01SA	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AJJ01QZ	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AJH0217	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AJJ01TE	SFP+-10G-SR
Xcvr 4	REV 01	740-031980	AJJ01KV	SFP+-10G-SR
Xcvr 5	REV 01	740-031980	AJJ01MU	SFP+-10G-SR
Xcvr 6	REV 01	740-031980	AJJ01R0	SFP+-10G-SR
Xcvr 7	REV 01	740-031980	AJJ01TC	SFP+-10G-SR
Xcvr 8	REV 01	740-031980	AJJ0364	SFP+-10G-SR
Xcvr 9	REV 01	740-031980	AJD0GV3	SFP+-10G-SR
Xcvr 10	REV 01	740-031980	B10M03343	SFP+-10G-SR
Xcvr 11	REV 01	740-031980	AJJ01QJ	SFP+-10G-SR
LMB 0	REV 05	711-034381	EJ8490	Type-0 LMB
LMB 1	REV 04	711-035774	EJ8517	Type-1 LMB
LMB 2	REV 05	711-034381	EJ8489	Type-0 LMB
FPC 3	REV 07	750-032819	EG3637	FPC Type 5-3D
CPU	REV 09	711-030686	EG0150	SNG PMB
PIC 0	REV 08	750-035293	EF3657	1x100GE
Xcvr 0	REV 01	740-032210	C22CQNJ	CFP-100G-LR4



PIC 1	REV 10	750-034624	BBAN4098	12x10GE (LAN/WAN) SFPP
Xcvr 0	REV 01	740-031980	B11J04902	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11J04891	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AJJ01MX	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B11J04183	SFP+-10G-SR
Xcvr 4	REV 01	740-031980	B11J04894	SFP+-10G-SR
Xcvr 5	REV 01	740-031980	B11J04184	SFP+-10G-SR
Xcvr 6	REV 01	740-031980	B11J04897	SFP+-10G-SR
Xcvr 7	REV 01	740-031980	B11J04899	SFP+-10G-SR
Xcvr 8	REV 01	740-031980	AJJ01TV	SFP+-10G-SR
Xcvr 9	REV 01	740-031980	B11J04057	SFP+-10G-SR
Xcvr 10	REV 01	740-031980	AJJ01M4	SFP+-10G-SR
Xcvr 11	REV 01	740-031980	B11J04905	SFP+-10G-SR
LMB 0	REV 04	711-034381	EG1524	Type-0 LMB
LMB 1	REV 03	711-035774	EG0345	Type-1 LMB
LMB 2	REV 04	711-034381	EG1522	Type-0 LMB
FPC 5	REV 03	710-033871	BBAJ0768	FPC Type 4-ES
CPU	REV 11	710-016744	BBAH9342	ST-PMB2
PIC 0	REV 09	750-029262	EE6789	100GE
PIC 1	REV 03	750-034781	EE6655	100GE CFP
Xcvr 0	REV 01	740-032210	J11A22334	CFP-100G-LR4
BRIDGE 0	REV 03	711-029995	EE6572	100GE Bridge Board
MMB 0	REV 07	710-025563	BBAJ4657	ST-MMB2
MMB 1	REV 07	710-025563	BBAJ3073	ST-MMB2
FPC 6	REV 05	750-010153	EF4936	FPC Type 5-3D
CPU	REV 06	711-030686	EF4189	SNG PMB
PIC 0	REV 10	750-034624	BBAN4109	12x10GE (LAN/WAN) SFPP
Xcvr 0	REV 01	740-031980	B11J04895	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11J04898	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	B11J04021	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	B11J04903	SFP+-10G-SR
Xcvr 4	REV 01	740-031980	B11J04311	SFP+-10G-SR
Xcvr 5	REV 01	740-031980	B11J04059	SFP+-10G-SR
Xcvr 6	REV 01	740-031980	B11J04016	SFP+-10G-SR
Xcvr 7	REV 01	740-031980	B11J04017	SFP+-10G-SR
Xcvr 8	REV 01	740-031980	B11J04887	SFP+-10G-SR
Xcvr 9	REV 01	740-031980	B11J04297	SFP+-10G-SR
Xcvr 10	REV 01	740-031980	B11J04893	SFP+-10G-SR
Xcvr 11	REV 01	740-031980	B11J04022	SFP+-10G-SR
PIC 1	REV 02	750-034624	EE3711	12x10GE (LAN/WAN) SFPP
Xcvr 0	REV 01	740-031980	AJH033X	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AJJ01N0	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AJJ01SV	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AJJ032L	SFP+-10G-SR
Xcvr 4	REV 01	740-031980	B10M01593	SFP+-10G-SR
Xcvr 5	REV 01	740-031980	AJD0FF1	SFP+-10G-SR
Xcvr 6	REV 01	740-031980	AJJ01NU	SFP+-10G-SR
Xcvr 7	REV 01	740-031980	123363A01305	SFP+-10G-SR
Xcvr 8	REV 01	740-031980	B10M00361	SFP+-10G-SR
Xcvr 9	REV 01	740-031980	AJJ01M7	SFP+-10G-SR
Xcvr 10	REV 01	740-031980	AJJ032X	SFP+-10G-SR
Xcvr 11	REV 01	740-031980	AJJ01PG	SFP+-10G-SR
LMB 0	REV 04	711-034381	EF3838	Type-0 LMB
LMB 1	REV 03	711-035774	EF3821	Type-1 LMB
LMB 2	REV 04	711-034381	EF3834	Type-0 LMB
SPMB 0	REV 05	710-023321	ED1990	LCC Switch CPU
SPMB 1	REV 05	710-023321	EA2768	LCC Switch CPU
SIB 0	REV 02	711-036340	EF8802	SIB-HC-3D
SIB 1	REV 07	711-036340	EG2286	SIB-HC-3D
SIB 2	REV 07	711-036340	EG2252	SIB-HC-3D

SIB 3	REV 02	711-036340	EF1358	SIB-HC-3D
SIB 4	REV 02	711-036340	EF8806	SIB-HC-3D
Fan Tray 0				Front Top Fan Tray
Fan Tray 1				Front Bottom Fan Tray
-- Rev 2				
Fan Tray 2				Rear Fan Tray -- Rev 3

### show chassis hardware models (T4000 Router)

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user@host> show chassis hardware models
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Hardware inventory:				
Item	Version	Part number	Serial number	FRU model number
Midplane	REV 01	710-027486	RC8355	CHAS-BP-T1600-S
FPM Display	REV 01	710-021387	EF6764	CRAFT-T1600-S
CIP	REV 06	710-002895	BBAD9210	CIP-L-T640-S
PEM 0	REV 01	740-036442	VA00016	PWR-T-6-60-DC
SCG 0	REV 18	710-003423	BBAD7248	SCG-T-S
SCG 1	REV 18	710-003423	BBAE3874	SCG-T-S
Routing Engine 0	REV 05	740-026941	P737F-002248	RE-DUO-C1800-8G-S
Routing Engine 1	REV 06	740-026941	P737F-002653	RE-DUO-C1800-8G-S
CB 0	REV 09	710-022597	ED0295	CB-LCC-S
CB 1	REV 09	710-022597	EA6050	CB-LCC-S
FPC 3				
PIC 0	REV 08	750-035293	EF3657	PF-1CGE-CFP
PIC 1	REV 10	750-034624	BBAN4098	PF-12XGE-SFPP
FPC 5	REV 03	710-033871	BBAJ0768	T1600-FPC4-ES
PIC 1	REV 03	750-034781	EE6655	PD-1CE-CFP-FPC4
FPC 6				
PIC 0	REV 10	750-034624	BBAN4109	PF-12XGE-SFPP
Fan Tray 0				FANTRAY-T-S
Fan Tray 1				FANTRAY-T4000-S
Fan Tray 2				FAN-REAR-TXP-LCC

### show chassis hardware lcc (TX Matrix Router)

```
user@host> show chassis hardware lcc 0
```

```
lcc0-re0:
```

Hardware inventory:				
Item	Version	Part number	Serial number	Description
Chassis			65751	T640
Midplane	REV 03	710-005608	RA1408	T640 Backplane
FPM GBUS	REV 09	710-002901	RA2784	T640 FPM Board
FPM Display	REV 05	710-002897	RA2825	FPM Display
CIP	REV 06	710-002895	HT0684	T Series CIP
PEM 0	Rev 11	740-002595	PM18483	Power Entry Module
PEM 1	Rev 11	740-002595	qb13984	Power Entry Module
SCG 0	REV 11	710-003423	HT0022	T640 Sonet Clock Gen.
Routing Engine 0	REV 13	740-005022	210865700363	RE-3.0 (RE-600)
CB 0	REV 03	710-007655	HW1195	Control Board (CB-T)
FPC 1	REV 05	710-007527	HM3245	FPC Type 2
CPU	REV 14	710-001726	HM1084	FPC CPU
PIC 0	REV 02	750-007218	AZ1112	2x OC-12 ATM2 IQ, SMIR
PIC 1	REV 02	750-007745	HG3462	4x OC-3 SONET, SMIR
PIC 2	REV 14	750-001901	BA5390	4x OC-12 SONET, SMIR
PIC 3	REV 09	750-008155	HS3012	2x G/E IQ, 1000 BASE

SFP 0		NON-JNPR	P1186TY	SFP-S
SFP 1	REV 01	740-007326	P11WLTF	SFP-SX
MMB 1	REV 02	710-005555	HL7514	MMB-288mbit
PPB 0	REV 04	710-003758	HM4405	PPB Type 2
PPB 1	REV 04	710-003758	AV1960	PPB Type 2
FPC 2	REV 08	710-010154	HZ3578	E-FPC Type 3
CPU	REV 05	710-010169	HZ3219	FPC CPU-Enhanced
PIC 0	REV 02	750-009567	HX2882	1x 10GE(LAN), XENPAK
SFP 0	REV 01	740-009898	USC202U709	XENPAK-LR
PIC 1	REV 03	750-003336	HJ9954	4x OC-48 SONET, SMSR
PIC 2	REV 01	750-004535	HC0235	1x OC-192 SM SR1
PIC 3	REV 07	750-007141	HX1699	10x 1GE(LAN), 1000 BASE

SFP 0	REV 01	740-007326	2441042	SFP-SX
SFP 1	REV 01	740-007326	2441027	SFP-SX
MMB 0	REV 03	710-010171	HV2365	MMB-5M3-288mbit
MMB 1	REV 03	710-010171	HZ3888	MMB-5M3-288mbit
SPMB 0	REV 09	710-003229	HW5245	T Series Switch CPU
SIB 3	REV 07	710-005781	HR5927	SIB-L8-F16
B Board	REV 06	710-005782	HR5971	SIB-L8-F16 (B)
SIB 4	REV 07	710-005781	HR5903	SIB-L8-F16
B Board	REV 06	710-005782	HZ5275	SIB-L8-F16 (B)

#### show chassis hardware scc (TX Matrix Router)

```
user@host> show chassis hardware scc
```

```
scc-re0:
```

```
-----
Hardware inventory:
```

Item	Version	Part number	Serial number	Description
Chassis				TX Matrix
Midplane	REV 04	710-004396	RB0014	SCC Midplane
FPM GBUS	REV 04	710-004617	HW9141	SCC FPM Board
FPM Display	REV 04	710-004619	HS5950	SCC FPM
CIP 0	REV 01	710-010218	HV9151	SCC CIP
CIP 1	REV 01	710-010218	HV9152	SCC CIP
PEM 1	Rev 11	740-002595	QB13977	Power Entry Module
Routing Engine 0	REV 05	740-008883	P11123900153	RE-4.0 (RE-1600)
CB 0	REV 01	710-011709	HR5964	Control Board (CB-TX)
SPMB 0	REV 09	710-003229	HW5293	T Series Switch CPU
SIB 3				
SIB 4	REV 01	710-005839	HW1177	SIB-S8-F16
B Board	REV 01	710-005840	HW1202	SIB-S8-F16 (B)

#### show chassis hardware (T1600 Router)

```
user@host> show chassis hardware
```

```
Hardware inventory:
```

Item	Version	Part number	Serial number	Description
Chassis			B2703	T1600
Midplane	REV 03	710-005608	RC4137	T640 Backplane
FPM GBUS	REV 10	710-002901	DT7062	T640 FPM Board
FPM Display	REV 05	710-002897	DS3067	FPM Display
CIP	REV 06	710-002895	DT3386	T-series CIP
PEM 0	Rev 07	740-017906	UA26344	Power Entry Module 3x80
PEM 1	Rev 18	740-002595	UF38441	Power Entry Module
SCG 0	REV 15	710-003423	DV0941	T640 Sonet Clock Gen.

Routing Engine 0	REV 08	740-014082	9009014502	RE-A-2000
Routing Engine 1	REV 07	740-014082	9009009591	RE-A-2000
CB 0	REV 05	710-007655	JA9360	Control Board (CB-T)
CB 1	REV 03	710-017707	DT3251	Control Board (CB-T)
FPC 0	REV 07	710-013558	DR4253	E2-FPC Type 2
CPU	REV 05	710-013563	DS3902	FPC CPU-Enhanced
PIC 0	REV 01	750-010618	CB5446	4x G/E SFP, 1000 BASE
Xcvr 0	REV 01	740-011613	P9F11CW	SFP-SX
Xcvr 1	REV 01	740-011613	P9F15C2	SFP-SX
Xcvr 2	REV 01	740-011782	PB94K0L	SFP-SX
PIC 1	REV 06	750-001900	HB6399	1x OC-48 SONET, SMSR
PIC 2	REV 14	750-001901	AP1092	4x OC-12 SONET, SMIR
PIC 3	REV 07	750-001900	AR8275	1x OC-48 SONET, SMSR
MMB 1	REV 07	710-010171	DS1524	MMB-5M3-288mbit
FPC 1	REV 06	710-013553	DL9067	E2-FPC Type 1
CPU	REV 04	710-013563	DM1685	FPC CPU-Enhanced
PIC 0	REV 08	750-001072	AB1688	1x G/E, 1000 BASE-SX
PIC 1	REV 10	750-012266	JX5519	4x 1GE(LAN), IQ2
Xcvr 0	REV 01	740-011613	AM0812S8UK6	SFP-SX
Xcvr 2	REV 01	740-011613	AM0812S8UK1	SFP-SX
Xcvr 3	REV 01	740-011782	P8N1YHG	SFP-SX
PIC 2	REV 22	750-005634	DP0083	1x CHOC12 IQ SONET, SMIR
MMB 1	REV 07	710-008923	DN1862	MMB 3M 288-bit
FPC 2	REV 01	710-005548	HJ9899	FPC Type 3
CPU	REV 06	710-001726	HC0586	FPC CPU
PIC 0	REV 16	750-007141	NC9660	10x 1GE(LAN), 1000 BASE
Xcvr 0	REV 01	740-011613	AM0812S8XAR	SFP-SX
Xcvr 1	REV 01	740-011782	P920E7B	SFP-SX
Xcvr 2	REV 01	740-011613	AM0812S8XAU	SFP-SX
Xcvr 4	REV 01	740-011613	AM0812S8XAK	SFP-SX
Xcvr 5	REV 01	740-011613	AM0812S8XAA	SFP-SX
Xcvr 6	REV 01	740-011613	PAJ4NKY	SFP-SX
Xcvr 7	REV 01	740-011613	AM0812S8UJW	SFP-SX
Xcvr 8	REV 01	740-011782	PB81X89	SFP-SX
Xcvr 9	REV 01	740-011613	AM0812S8UJX	SFP-SX
PIC 1	REV 06	750-015217	DK3280	8x 1GE(TYPE3), IQ2
Xcvr 0	REV 01	740-011782	P8POA3T	SFP-SX
Xcvr 1	REV 01	740-013111	5090002	SFP-T
Xcvr 2	REV 01	740-011613	AM0814S93BQ	SFP-SX
Xcvr 4		NON-JNPR	PDE0FAN	SFP-SX
Xcvr 5	REV 01	740-011782	P8Q20XY	SFP-SX
Xcvr 6	REV 01	740-011613	AM0812S8UJV	SFP-SX
Xcvr 7	REV 01	740-011613	AM0812S8UP7	SFP-SX
PIC 2	REV 05	750-004695	HT4383	1x Tunnel
PIC 3	REV 17	750-009553	RL0204	4x OC-48 SONET
Xcvr 0	REV 01	740-011785	PDS3T23	SFP-SR
Xcvr 1	REV 01	740-011785	P6Q0F3E	SFP-SR
MMB 0	REV 03	710-004047	HD5843	MMB-288mbit
MMB 1	REV 03	710-004047	HE3208	MMB-288mbit
PPB 0	REV 02	710-002845	HA4524	PPB Type 3
PPB 1	REV 02	710-002845	HA4766	PPB Type 3
FPC 3	REV 01	710-010154	HR0863	E-FPC Type 3
CPU	REV 01	710-010169	HN3422	FPC CPU-Enhanced
PIC 0	REV 07	750-012793	WF5096	1x 10GE(LAN/WAN) IQ2
Xcvr 0		NON-JNPR	M64294TP	XFP-10G-LR
PIC 1	REV 25	750-007141	DV2127	10x 1GE(LAN), 1000 BASE
Xcvr 0	REV 01	740-011613	PFA6LTJ	SFP-SX

Xcvr 1	REV 01	740-011782	P9P0XV4	SFP-SX
Xcvr 2	REV 01	740-011782	P9M0TNX	SFP-SX
Xcvr 4	REV 01	740-011782	P9B0TTP	SFP-SX
Xcvr 5		NON-JNPR	PBS4LED	SFP-SX
PIC 2	REV 17	750-009553	RL0212	4x OC-48 SONET
Xcvr 0	REV 01	740-011785	PDS3T8G	SFP-SR
PIC 3	REV 32	750-003700	DL1279	1x OC-192 12xMM VSR
MMB 0	REV 01	710-010171	HR0821	MMB-288mbit
MMB 1	REV 01	710-010171	HR0818	MMB-288mbit
FPC 4	REV 16	710-013037	EB4919	FPC Type 4-ES
CPU	REV 09	710-016744	BBAA4382	ST-PMB2
PIC 0	REV 03	711-029996	EB1569	100GE
PIC 1	REV 05	711-029999	EB9983	100GE CFP
Xcvr 0	REV 0	740-032210	J10G80746	CFP-100G-LR4
BRIDGE 0	REV 02	711-029995	EB2235	100GE Bridge Board
MMB 0	REV 04	710-025563	BBAA7112	ST-MMB2
MMB 1	REV 04	710-025563	BBAA7149	ST-MMB2
FPC 5	REV 02	710-013037	DE3407	FPC Type 4-ES
CPU	REV 04	710-016744	DA2124	ST-PMB2
PIC 0	REV 16	750-012518	DF2554	4x OC-192 SONET XFP
Xcvr 0	REV 01	740-014279	AA0745N1FX8	XFP-OC192-SR
Xcvr 1	REV 01	740-014279	AA0748N1HN5	XFP-OC192-SR
Xcvr 2	REV 01	740-014279	AA0748N1HT6	XFP-OC192-SR
Xcvr 3	REV 01	740-014279	AA0744N1EC9	XFP-OC192-SR
PIC 1	REV 01	750-010850	JA0329	1x OC-768 SONET SR
MMB 0	REV 04	710-016036	DE9577	ST-MMB2
MMB 1	REV 04	710-016036	DK4060	ST-MMB2
FPC 6	REV 14	710-013037	DV1431	FPC Type 4-ES
CPU	REV 09	710-016744	DT9020	ST-PMB2
PIC 0	REV 11	750-017405	DM6261	4x 10GE (LAN/WAN) XFP
Xcvr 0	REV 01	740-014289	C701XU05Q	XFP-10G-SR
Xcvr 1	REV 01	740-014279	AA0748N1HPT	XFP-10G-LR
Xcvr 2	REV 01	740-014289	T08E19189	XFP-10G-SR
Xcvr 3	REV 01	740-014289	C715XU058	XFP-10G-SR
PIC 1	REV 13	750-017405	DP8772	4x 10GE (LAN/WAN) XFP
Xcvr 0	REV 02	740-011571	C850XJ037	XFP-10G-SR
Xcvr 1	REV 02	740-014289	C839XU0L9	XFP-10G-SR
Xcvr 2	REV 02	740-014289	C834XU05A	XFP-10G-SR
Xcvr 3	REV 02	740-014289	C810XU0CE	XFP-10G-SR
MMB 0	REV 01	710-025563	DT8454	ST-MMB2
MMB 1	REV 01	710-025563	DT8366	ST-MMB2
FPC 7	REV 09	710-007529	HZ7624	FPC Type 3
CPU	REV 15	710-001726	HZ1413	FPC CPU
PIC 0	REV 10	750-012793	DM5627	1x 10GE (LAN/WAN) IQ2
Xcvr 0	REV 02	740-011571	C831XJ062	XFP-10G-SR
PIC 1	REV 01	750-015217	JT6762	8x 1GE(TYPE3), IQ2
Xcvr 0	REV 01	740-011782	P8Q25JU	SFP-SX
Xcvr 1	REV 01	740-011782	P9B0U0K	SFP-SX
PIC 2	REV 01	750-015217	JS4268	8x 1GE(TYPE3), IQ2
Xcvr 0	REV 01	740-011613	AM0812S8XBZ	SFP-SX
Xcvr 1	REV 01	740-011613	AM0812S8XAP	SFP-SX
Xcvr 2	REV 01	740-011613	AM0812S8XBY	SFP-SX
Xcvr 3	REV 01	740-011613	AM0812S8XBX	SFP-SX
Xcvr 4	REV 01	740-011613	P9F1652	SFP-SX
Xcvr 5	REV 01	740-011782	P8Q21YC	SFP-SX
Xcvr 6	REV 01	740-011782	P8Q27HQ	SFP-SX
Xcvr 7	REV 01	740-011613	P8E2SSU	SFP-SX
PIC 3	REV 15	750-009450	NB6790	1x OC-192 SM SR2
MMB 0	REV 03	710-005555	HZ3450	MMB-288mbit
MMB 1	REV 03	710-005555	HZ3415	MMB-288mbit

PPB 0	REV 04	710-002845	HP0887	PPB Type 3
PPB 1	REV 04	710-002845	HW5255	PPB Type 3
SPMB 0	REV 10	710-003229	HX3699	T-series Switch CPU
SPMB 1	REV 12	710-003229	DT3091	T-series Switch CPU
SIB 0	REV 07	710-013074	DS4747	SIB-I8-SF
SIB 1	REV 07	710-013074	DS4942	SIB-I8-SF
SIB 2	REV 07	710-013074	DS4965	SIB-I8-SF
SIB 3	REV 07	710-013074	DS4990	SIB-I8-SF
SIB 4	REV 07	710-013074	DS4944	SIB-I8-SF
Fan Tray 0				Front Top Fan Tray
Fan Tray 1				Front Bottom Fan Tray
Fan Tray 2				Rear Fan Tray -- Rev 2

### show chassis hardware (TX Matrix Plus Router)

```
user@host> show chassis hardware
```

```
sfc0-re0:
```

```
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```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN113186EAHB	TXP
Midplane	REV 05	710-022574	TS3822	SFC Midplane
FPM Display	REV 03	710-024027	DW4701	TXP FPM Display
CIP 0	REV 05	710-023792	DW7998	TXP CIP
CIP 1	REV 05	710-023792	DW7999	TXP CIP
PEM 0	Rev 04	740-027463	UM26367	Power Entry Module
PEM 1	Rev 04	740-027463	UM26346	Power Entry Module
Routing Engine 0	REV 06	740-026942	737A-1081	RE-DUO-2600
Routing Engine 1	REV 06	740-026942	737A-1043	RE-DUO-2600
CB 0	REV 05	710-022606	DW4435	SFC Control Board
CB 1	REV 09	710-022606	DW6100	SFC Control Board
SPMB 0		BUILTIN		SFC Switch CPU
SPMB 1		BUILTIN		SFC Switch CPU
SIB F13 0	REV 04	750-024564	DW5764	F13 SIB
B Board	REV 03	710-023431	DW9053	F13 SIB Mezz
SIB F13 3	REV 04	750-024564	DW5785	F13 SIB
B Board	REV 03	710-023431	DW9030	F13 SIB Mezz
SIB F13 6				
SIB F13 8	REV 04	750-024564	DW5752	F13 SIB
B Board	REV 03	710-023431	DW9051	F13 SIB Mezz
SIB F13 11	REV 04	750-024564	DW5782	F13 SIB
B Board	REV 03	710-023431	DW9058	F13 SIB Mezz
SIB F13 12	REV 03	750-024564	DT9466	F13 SIB
B Board	REV 02	710-023431	DT6556	F13 SIB Mezz
SIB F2S 0/0	REV 05	710-022603	DW7898	F2S SIB
B Board	REV 05	710-023787	DW7625	F2S SIB Mezz
SIB F2S 0/2	REV 05	710-022603	DW7811	F2S SIB
B Board	REV 05	710-023787	DW7550	F2S SIB Mezz
SIB F2S 0/4	REV 04	710-022603	DW4873	F2S SIB
B Board	REV 05	710-023787	DW8509	F2S SIB Mezz
SIB F2S 0/6	REV 04	710-022603	DW4867	F2S SIB
B Board	REV 05	710-023787	DW8472	F2S SIB Mezz
SIB F2S 1/0	REV 04	710-022603	DW4871	F2S SIB
B Board	REV 05	710-023787	DW8497	F2S SIB Mezz
SIB F2S 1/2	REV 05	710-022603	DW7868	F2S SIB
B Board	REV 05	710-023787	DW7551	F2S SIB Mezz
SIB F2S 1/4	REV 04	710-022603	DW4854	F2S SIB
B Board	REV 05	710-023787	DW8496	F2S SIB Mezz
SIB F2S 1/6	REV 05	710-022603	DW7889	F2S SIB

B Board	REV 05	710-023787	DW7496	F2S SIB Mezz
SIB F2S 2/0	REV 04	710-022603	DW4852	F2S SIB
B Board	REV 05	710-023787	DW8498	F2S SIB Mezz
SIB F2S 2/2	REV 04	710-022603	DW4845	F2S SIB
B Board	REV 05	710-023787	DW8457	F2S SIB Mezz
SIB F2S 2/4	REV 05	710-022603	DW7802	F2S SIB
B Board	REV 05	710-023787	DW7562	F2S SIB Mezz
SIB F2S 2/6	REV 04	710-022603	DW4822	F2S SIB
B Board	REV 05	710-023787	DW8467	F2S SIB Mezz
SIB F2S 3/0	REV 05	710-022603	DW7815	F2S SIB
B Board	REV 05	710-023787	DW7518	F2S SIB Mezz
SIB F2S 3/2	REV 03	710-022603	DV0068	F2S SIB
B Board	REV 03	710-023787	DT9974	F2S SIB Mezz
SIB F2S 3/4	REV 05	710-022603	DW7874	F2S SIB
B Board	REV 05	710-023787	DW7601	F2S SIB Mezz
SIB F2S 3/6	REV 03	710-022603	DV0033	F2S SIB
B Board	REV 03	710-023787	DT9969	F2S SIB Mezz
SIB F2S 4/0	REV 03	710-022603	DV0043	F2S SIB
B Board	REV 03	710-023787	DT9948	F2S SIB Mezz
SIB F2S 4/2	REV 05	710-022603	DW5446	F2S SIB
B Board	REV 05	710-023787	DW7611	F2S SIB Mezz
SIB F2S 4/4	REV 04	710-022603	DW4826	F2S SIB
B Board	REV 05	710-023787	DW8458	F2S SIB Mezz
SIB F2S 4/6	REV 03	710-022603	DV0026	F2S SIB
B Board	REV 03	710-023787	DT9963	F2S SIB Mezz
Fan Tray 0	REV 02	760-024497	DR8290	Front Fan Tray
Fan Tray 1	REV 02	760-024497	DR8293	Front Fan Tray
Fan Tray 2	REV 05	760-024502	DR8280	Rear Fan Tray
Fan Tray 3				
Fan Tray 4	REV 05	760-024502	DR8276	Rear Fan Tray
Fan Tray 5	REV 02	760-024502	DP5643	Rear Fan Tray

lcc0-re0:

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Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN11036F8AHA	T1600
Midplane	REV 03	710-017247	RC3799	T-series Backplane
FPM GBUS	REV 10	710-002901	DP7009	T640 FPM Board
FPM Display	REV 01	710-021387	DN7026	T1600 FPM Display
CIP	REV 06	710-002895	DP6024	T-series CIP
PEM 1	Rev 02	740-023211	WA50019	Power Entry Module 4x60A
SCG 0	REV 15	710-003423	DR6757	T640 Sonet Clock Gen.
SCG 1	REV 15	710-003423	DS2225	T640 Sonet Clock Gen.
Routing Engine 0	REV 01	740-026941	737F-1040	RE-DUO-1800
Routing Engine 1	REV 01	740-026941	737F-1016	RE-DUO-1800
CB 0	REV 06	710-022597	DX4011	LCC Control Board
CB 1	REV 06	710-022597	DX4017	LCC Control Board
FPC 1	REV 07	710-013035	DN5847	FPC Type 3-ES
CPU	REV 08	710-016744	DP2570	ST-PMB2
PIC 0	REV 05	750-015217	DB0418	8x 1GE(TYPE3), IQ2
Xcvr 0	REV 01	740-011782	P8Q27ZG	SFP-SX
Xcvr 1		NON-JNPR	PDA1U0D	SFP-SX
Xcvr 2	REV 01	740-011613	P9F1ALW	SFP-SX
Xcvr 3	REV 01	740-011782	PBA403V	SFP-SX
Xcvr 4		NON-JNPR	PDE09DP	SFP-SX
Xcvr 5	REV 01	740-011782	PCH2P4K	SFP-SX
Xcvr 6	REV 01	740-011782	PB94K0F	SFP-SX
Xcvr 7	REV 01	740-011782	PBA2R2A	SFP-SX
PIC 1	REV 03	750-004424	HJ4020	1x 10GE(LAN), DWDM

PIC 2	REV 01	750-003336	HG6073	4x OC-48 SONET, SMSR
MMB 0	REV 04	710-016036	DP3401	ST-MMB2
FPC 3	REV 12	710-013037	DR1169	FPC Type 4-ES
CPU	REV 08	710-016744	DP9429	ST-PMB2
PIC 0	REV 02	750-010850	JA0332	1x OC-768 SONET SR
MMB 0	REV 04	710-016036	DR0628	ST-MMB2
MMB 1	REV 04	710-016036	DR0592	ST-MMB2
FPC 4	REV 05	710-021534	DR7350	FPC Type 1-ES
CPU	REV 08	710-016744	DP8096	ST-PMB2
PIC 0	REV 04	750-014627	DP9171	4x OC-3 1x OC-12 SFP
Xcvr 0	REV 02	740-011615	PDE2RVR	SFP-SR
PIC 1	REV 22	750-005634	DS5815	1x CHOC12 IQ SONET, SMIR
PIC 2	REV 09	750-002911	CF4539	4x F/E, 100 BASE-TX
PIC 3	REV 08	750-021652	DR2827	1x CHOC12 IQE SONET
Xcvr 0		NON-JNPR	8	UNKNOWN
MMB 0	REV 04	710-016036	DR0809	ST-MMB2
FPC 5	REV 07	710-007529	HS5608	FPC Type 3
CPU	REV 15	710-001726	HX4351	FPC CPU
PIC 0	REV 14	750-009567	WJ8961	1x 10GE(LAN), XENPAK
Xcvr 0	REV 01	740-013170	J05K05961	XENPAK-LR
PIC 1	REV 16	750-007141	JJ8146	10x 1GE(LAN), 1000 BASE
Xcvr 1	REV 01	740-011613	P9F117T	SFP-SX
Xcvr 2	REV 01	740-011782	PBA2VCL	SFP-SX
Xcvr 3	REV 01	740-011782	PB83DRB	SFP-SX
Xcvr 4	REV 01	740-011613	AM0812S8UP8	SFP-SX
PIC 2	REV 12	750-009567	WF3566	1x 10GE(LAN), XENPAK
Xcvr 0	REV 02	740-013170	T07C94489	XENPAK-LR
MMB 0	REV 03	710-005555	HZ1907	MMB-288mbit
MMB 1	REV 03	710-005555	HW5283	MMB-288mbit
PPB 0	REV 04	710-002845	HZ7717	PPB Type 3
PPB 1	REV 04	710-002845	HS0110	PPB Type 3
FPC 6	REV 07	710-013035	DP7486	FPC Type 3-ES
CPU	REV 08	710-016744	DP2545	ST-PMB2
PIC 0	REV 09	750-009567	NE6323	1x 10GE(LAN), XENPAK
Xcvr 0	REV 02	740-013170	T09C71959	XENPAK-LR
PIC 1	REV 06	750-015217	DN4775	8x 1GE(TYPE3), IQ2
Xcvr 0	REV 01	740-011782	P7E0T6M	SFP-SX
Xcvr 1	REV 01	740-011613	AM0812S8XAY	SFP-SX
Xcvr 2	REV 01	740-011782	P7E0T6J	SFP-SX
Xcvr 3	REV 01	740-011782	PCH2P7D	SFP-SX
Xcvr 4	REV 01	740-011782	P9B0QYT	SFP-SX
Xcvr 5	REV 01	740-011613	AM0812S8WQJ	SFP-SX
Xcvr 6	REV 02	740-013111	9301220	SFP-T
Xcvr 7	REV 01	740-011782	P9B0TZ5	SFP-SX
PIC 2	REV 06	750-015217	DM6747	8x 1GE(TYPE3), IQ2
Xcvr 0	REV 01	740-011613	PAP0ZB2	SFP-SX
Xcvr 1	REV 01	740-013111	70191002	SFP-T
Xcvr 6	REV 01	740-011782	PBA29H8	SFP-SX
Xcvr 7	REV 01	740-011613	AM0812S8WQG	SFP-SX
MMB 0	REV 04	710-016036	DP3238	ST-MMB2
FPC 7	REV 03	710-021540	DV3154	FPC Type 2-ES
CPU	REV 09	710-016744	DT9053	ST-PMB2
PIC 0	REV 13	750-001901	HB4225	4x OC-12 SONET, SMIR
PIC 1	REV 05	750-001900	AD3644	1x OC-48 SONET, SMSR
PIC 2	REV 10	750-008155	HV0335	2x G/E IQ, 1000 BASE
Xcvr 0	REV 01	740-011782	PCH2UKF	SFP-SX
Xcvr 1	REV 01	740-011782	PCH2V19	SFP-SX
PIC 3	REV 03	750-014638	JS9493	1x OC-48-12-3 SFP



Xcvr 0	REV 01	740-011785	P6Q0ENK	SFP-SR
MMB 0	REV 05	710-016036	DP3323	ST-MMB2
SPMB 0	REV 04	710-023321	DX3004	LCC Switch CPU
SPMB 1	REV 04	710-023321	DX3009	LCC Switch CPU
SIB 0	REV 07	710-022594	DW4195	LCC SIB
B Board	REV 07	710-023185	DW3930	LCC SIB Mezz
SIB 1	REV 07	710-022594	DW4179	LCC SIB
B Board	REV 07	710-023185	DW3919	LCC SIB Mezz
SIB 2				
SIB 3	REV 06	710-022594	DT8251	LCC SIB
B Board	REV 06	710-023185	DT5792	LCC SIB Mezz
SIB 4	REV 08	710-022594	DW8014	LCC SIB
B Board	REV 07	710-023185	DW3917	LCC SIB Mezz
Fan Tray 0				Front Top Fan Tray
Fan Tray 1				Front Bottom Fan Tray
Fan Tray 2				Rear Fan Tray -- Rev 3

lcc1-re0:

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Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN1102270AHA	T1600
Midplane	REV 04	710-017247	RC5358	T-series Backplane
FPM GBUS	REV 10	710-002901	DS3443	T640 FPM Board
FPM Display	REV 01	710-021387	DS6411	T1600 FPM Display
CIP	REV 06	710-002895	DS4235	T-series CIP
PEM 0	Rev 02	740-023211	VM82438	Power Entry Module 4x60A
SCG 0	REV 15	710-003423	DS6649	T640 Sonet Clock Gen.
SCG 1	REV 15	710-003423	DR6775	T640 Sonet Clock Gen.
Routing Engine 0	REV 01	740-026941	737F-1083	RE-DUO-1800
Routing Engine 1	REV 01	740-026941	737F-1104	RE-DUO-1800
CB 0	REV 06	710-022597	DW8542	LCC Control Board
CB 1	REV 06	710-022597	DW8530	LCC Control Board
FPC 0	REV 02	710-010845	JE2392	FPC Type 4
CPU	REV 02	710-011481	JF6820	FPC CPU-Enhanced
PIC 0	REV 11	750-017405	DP7259	4x 10GE (LAN/WAN) XFP
Xcvr 0	REV 01	740-014279	AA0741N1C8T	XFP-10G-LR
Xcvr 1	REV 01	740-014279	AA0746N1GAM	XFP-10G-LR
Xcvr 2	REV 01	740-014279	AA0747N1H0B	XFP-10G-LR
Xcvr 3	REV 01	740-014279	AA0748N1HZ5	XFP-10G-LR
MMB 0	REV 03	710-010842	HY7601	ST-MMB
FPC 1	REV 16	710-013037	BBAA7398	FPC Type 4-ES
CPU	REV 09	710-016744	BBAA2329	ST-PMB2
PIC 0	REV 03	711-029996	EB1575	100GE
PIC 1	REV 06	750-034781	EB9980	100GE CFP
MMB 0	REV 04	710-025563	BBAA5325	ST-MMB2
MMB 1	REV 04	710-025563	BBAA5444	ST-MMB2
FPC 2	REV 16	710-013037	BBAA7185	FPC Type 4-ES
CPU	REV 09	710-016744	BBAA3522	ST-PMB2
PIC 0	REV 03	711-029996	EB1557	100GE
PIC 1	REV 05	750-034781	EB4660	100GE CFP
Xcvr 0	REV 0	740-032210	J10F73666	CFP-100G-LR4
BRIDGE 0	REV 02	711-029995	EB2237	100GE Bridge Board
MMB 0	REV 04	710-025563	BBAA5347	ST-MMB2
MMB 1	REV 04	710-025563	BBAA5401	ST-MMB2
FPC 3	REV 10	710-021534	DZ0941	FPC Type 1-ES
CPU	REV 09	710-016744	DY6364	ST-PMB2
PIC 0	REV 13	750-012266	DK9192	4x 1GE(LAN), IQ2
Xcvr 0	REV 01	740-011613	AM0812S8WVD	SFP-SX
Xcvr 1		NON-JNPR	PDD63Q4	SFP-SX

Xcvr 2		NON-JNPR	PDE4G54	SFP-SX
Xcvr 3		NON-JNPR	PD40MAG	SFP-SX
PIC 1	REV 01	750-007641	HJ2003	1x G/E IQ, 1000 BASE
Xcvr 0	REV 01	740-011613	AM0812S8WVG	SFP-SX
PIC 3	REV 17	750-007444	JB6873	1x CHSTM1 IQ SDH, SMIR
MMB 0	REV 04	710-025563	DZ0281	ST-MMB2
FPC 4	REV 06	710-013035	DK0614	FPC Type 3-ES
CPU	REV 07	710-016744	DK1616	ST-PMB2
PIC 0	REV 22	750-007141	DM1870	10x 1GE(LAN), 1000 BASE
Xcvr 0	REV 01	740-011782	PCL3UKW	SFP-SX
Xcvr 1	REV 01	740-011782	P7E0T73	SFP-SX
Xcvr 2	REV 01	740-007326	P4TOWLR	SFP-SX
Xcvr 3	REV 01	740-011782	PAR1LRL	SFP-SX
Xcvr 4	REV 01	740-011782	P9MOU3Z	SFP-SX
Xcvr 5	REV 01	740-011782	P9MOU0C	SFP-SX
Xcvr 6	REV 01	740-011782	P9MOTLG	SFP-SX
Xcvr 7	REV 01	740-011782	P9MOU0F	SFP-SX
Xcvr 8	REV 01	740-011613	PFA6LAP	SFP-SX
Xcvr 9	REV 01	740-011782	PCH2POU	SFP-SX
PIC 1	REV 16	750-009450	CV2565	1x OC-192 SM SR2
PIC 2	REV 05	750-004424	HH3057	1x 10GE(LAN), 10GBASE-LR
PIC 3	REV 12	750-013423	DP0403	MultiServices 500
MMB 0	REV 04	710-016036	DK1988	ST-MMB2
FPC 5	REV 07	710-013560	DR0004	E2-FPC Type 3
CPU	REV 05	710-013563	DR0089	FPC CPU-Enhanced
PIC 0	REV 11	750-012793	DR6107	1x 10GE(LAN/WAN) IQ2
Xcvr 0	REV 01	740-014289	C743XU074	XFP-10G-SR
PIC 1	REV 01	750-004695	HD5980	1x Tunnel
PIC 2	REV 32	750-003700	DL3770	1x OC-192 12xMM VSR
PIC 3	REV 12	750-009553	WB8901	4x OC-48 SONET
Xcvr 0	REV 01	740-011785	P9D1GTQ	SFP-SR
Xcvr 1	REV 01	740-011785	PDSOMMB	SFP-SR
Xcvr 3	REV 01	740-011785	PDE1KXP	SFP-SR
MMB 0	REV 07	710-010171	DP7374	MMB-5M3-288mbit
MMB 1	REV 07	710-010171	DP7404	MMB-5M3-288mbit
FPC 6	REV 07	710-013035	DM0994	FPC Type 3-ES
CPU	REV 07	710-016744	DM3651	ST-PMB2
PIC 0	REV 07	750-015217	DN4743	8x 1GE(TYPE3), IQ2
Xcvr 3	REV 01	740-011613	AM0812S8XB0	SFP-SX
Xcvr 4	REV 01	740-011782	PB829RB	SFP-SX
Xcvr 5	REV 01	740-011782	P8J1SYX	SFP-SX
PIC 1	REV 03	750-003336	HJ9954	4x OC-48 SONET, SMSR
PIC 3	REV 02	750-012793	JM7665	1x 10GE(LAN/WAN) IQ2
MMB 0	REV 04	710-016036	DN6913	ST-MMB2
FPC 7	REV 08	710-010845	JM3958	FPC Type 4
CPU	REV 04	710-011481	JK3669	FPC CPU-Enhanced
PIC 0	REV 11	750-017405	DP8837	4x 10GE (LAN/WAN) XFP
Xcvr 1	REV 01	740-014279	753019A00277	XFP-10G-LR
Xcvr 2	REV 02	740-011571	C850XJ00P	XFP-10G-SR
Xcvr 3	REV 01	740-014279	AA0813N1RTG	XFP-10G-LR
MMB 0	REV 04	710-010842	JN1971	ST-MMB
SPMB 0	REV 04	710-023321	DW3629	LCC Switch CPU
SPMB 1	REV 04	710-023321	DW3621	LCC Switch CPU
SIB 0	REV 07	710-022594	DW4200	LCC SIB
B Board	REV 07	710-023185	DW3932	LCC SIB Mezz
SIB 1	REV 07	710-022594	DW4193	LCC SIB
B Board	REV 07	710-023185	DW3904	LCC SIB Mezz
SIB 2				

SIB 3	REV 07	710-022594	DW4210	LCC SIB
B Board	REV 06	710-023185	DT5780	LCC SIB Mezz
SIB 4	REV 08	710-022594	DW8019	LCC SIB
B Board	REV 06	710-023185	DT5795	LCC SIB Mezz
Fan Tray 0				Front Top Fan Tray
Fan Tray 1				Front Bottom Fan Tray
Fan Tray 2				Rear Fan Tray -- Rev 3

### show chassis hardware sfc (TX Matrix Plus Router)

```
user@host> show chassis hardware sfc 0
```

```
sfc0-re0:
```

```
-----
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN112F007AHB	TXP
Midplane	REV 05	710-022574	TS4027	SFC Midplane
FPM Display	REV 03	710-024027	DX0282	TXP FPM Display
CIP 0	REV 04	710-023792	DW4889	TXP CIP
CIP 1	REV 04	710-023792	DW4887	TXP CIP
PEM 0	Rev 07	740-027463	UM26368	Power Entry Module
Routing Engine 0	REV 01	740-026942	737A-1064	SFC RE
Routing Engine 1	REV 01	740-026942	737A-1082	SFC RE
CB 0	REV 09	710-022606	DW6099	SFC Control Board
CB 1	REV 09	710-022606	DW6096	SFC Control Board
SPMB 0		BUILTIN		SFC Switch CPU
SPMB 1		BUILTIN		SFC Switch CPU
SIB F13 0	REV 04	710-022600	DX0841	F13 SIB
B Board	REV 03	710-023431	DX0966	F13 SIB Mezz
SIB F13 1	REV 04	750-024564	DW5776	F13 SIB
B Board	REV 03	710-023431	DW9028	F13 SIB
SIB F13 3	REV 04	750-024564	DW5762	F13 SIB
B Board	REV 03	710-023431	DW9059	F13 SIB
SIB F13 4	REV 04	750-024564	DW5797	F13 SIB
B Board	REV 03	710-023431	DW9041	F13 SIB
SIB F13 6	REV 04	750-024564	DW5770	F13 SIB
B Board	REV 03	710-023431	DW9079	F13 SIB Mezz
SIB F13 7	REV 04	750-024564	DW5758	F13 SIB
B Board	REV 03	710-023431	DW9047	F13 SIB
SIB F13 8	REV 04	750-024564	DW5761	F13 SIB
B Board	REV 03	710-023431	DW9043	F13 SIB Mezz
SIB F13 9	REV 04	750-024564	DW5754	F13 SIB
B Board	REV 03	710-023431	DW9078	F13 SIB Mezz
SIB F13 11	REV 04	710-022600	DX0826	F13 SIB
B Board	REV 03	710-023431	DX0967	F13 SIB Mezz
SIB F13 12	REV 04	750-024564	DW5794	F13 SIB
B Board	REV 03	710-023431	DW9044	F13 SIB Mezz
SIB F2S 0/0	REV 05	710-022603	DW7897	F2S SIB
B Board	REV 05	710-023787	DW7657	NEO PMB
SIB F2S 0/2	REV 05	710-022603	DW7833	F2S SIB
B Board	REV 05	710-023787	DW7526	NEO PMB
SIB F2S 0/4	REV 05	710-022603	DW7875	F2S SIB
B Board	REV 05	710-023787	DW7588	NEO PMB
SIB F2S 0/6	REV 05	710-022603	DW7860	F2S SIB
B Board	REV 05	710-023787	DW7589	NEO PMB
SIB F2S 1/0	REV 04	710-022603	DW4820	F2S SIB
B Board	REV 05	710-023787	DW8510	NEO PMB
SIB F2S 1/2	REV 05	710-022603	DW7849	F2S SIB
B Board	REV 05	710-023787	DW7525	NEO PMB

SIB F2S 1/4	REV 05	710-022603	DW7927	F2S SIB
B Board	REV 05	710-023787	DW7556	F2S SIB Mezz
SIB F2S 1/6	REV 05	710-022603	DW7866	F2S SIB
B Board	REV 05	710-023787	DW7651	NEO PMB
SIB F2S 2/0	REV 05	710-022603	DW7880	F2S SIB
B Board	REV 05	710-023787	DW7523	NEO PMB
SIB F2S 2/2	REV 05	710-022603	DW7895	F2S SIB
B Board	REV 05	710-023787	DW7591	NEO PMB
SIB F2S 2/4	REV 05	710-022603	DW7907	F2S SIB
B Board	REV 05	710-023787	DW7590	NEO PMB
SIB F2S 2/6	REV 05	710-022603	DW7785	F2S SIB
B Board	REV 05	710-023787	DW7524	NEO PMB
SIB F2S 3/0	REV 05	710-022603	DW7782	F2S SIB
B Board	REV 05	710-023787	DW7634	NEO PMB
SIB F2S 3/2	REV 05	710-022603	DW7793	F2S SIB
B Board	REV 05	710-023787	DW7548	NEO PMB
SIB F2S 3/4	REV 05	710-022603	DW7779	F2S SIB
B Board	REV 05	710-023787	DW7587	NEO PMB
SIB F2S 3/6	REV 05	710-022603	DW7930	F2S SIB
B Board	REV 05	710-023787	DW7505	NEO PMB
SIB F2S 4/0	REV 05	710-022603	DW7867	F2S SIB
B Board	REV 05	710-023787	DW7656	NEO PMB
SIB F2S 4/2	REV 05	710-022603	DW7917	F2S SIB
B Board	REV 05	710-023787	DW7640	NEO PMB
SIB F2S 4/4	REV 05	710-022603	DW7929	F2S SIB
B Board	REV 05	710-023787	DW7643	NEO PMB
SIB F2S 4/6	REV 05	710-022603	DW7870	F2S SIB
B Board	REV 05	710-023787	DW7635	NEO PMB
Fan Tray 0	REV 06	760-024497	DV7831	Front Fan Tray
Fan Tray 1	REV 06	760-024497	DV9614	Front Fan Tray
Fan Tray 2	REV 06	760-024502	DV9618	Rear Fan Tray
Fan Tray 3	REV 06	760-024502	DV9616	Rear Fan Tray
Fan Tray 4	REV 06	760-024502	DV7807	Rear Fan Tray
Fan Tray 5	REV 06	760-024502	DV7828	Rear Fan Tray

### show chassis hardware extensive (TX Matrix Plus Router)

```
user@host> show chassis hardware extensive
```

```
sfc0-re0:
```

```
-----
Hardware inventory:
```

Item	Version	Part number	Serial number	Description
Chassis			JN112F007AHB	TXP
Jedec Code:	0x7fb0	EEPROM Version:	0x02	
		S/N:	JN112F007AHB	
Assembly ID:	0x052c	Assembly Version:	00.00	
Date:	00-00-0000	Assembly Flags:	0x00	
ID:	TXP			

```
Board Information Record:
```

```
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

```
I2C Hex Data:
```

```
Address 0x00: 7f b0 02 ff 05 2c 00 00 00 00 00 00 00 00 00 00
```

```
Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

```
Address 0x20: 4a 4e 31 31 32 46 30 30 37 41 48 42 00 00 00 00
```

```
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

```
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

```
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

```
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

```
Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

```

Midplane          REV 05   710-022574   TS4027          SFC Midplane
Jedec Code:      0x7fb0          EEPROM Version: 0x01
P/N:             710-022574      S/N:            TS4027
Assembly ID:     0x0962          Assembly Version: 01.05
Date:           03-23-2009      Assembly Flags: 0x00
Version:         REV 05
ID: SFC Midplane
Board Information Record:
  Address 0x00: ad 01 ff ff 00 1d b5 14 00 00 ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 01 ff 09 62 01 05 52 45 56 20 30 35 00 00
  Address 0x10: 00 00 00 00 37 31 30 2d 30 32 32 35 37 34 00 00
  Address 0x20: 53 2f 4e 20 54 53 34 30 32 37 00 00 00 17 03 07
  Address 0x30: d9 ff ff ff ad 01 ff ff 00 1d b5 14 00 00 ff ff
  Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
  Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff

FPM Display       REV 03   710-024027   DX0282          TXP FPM Display
Jedec Code:      0x7fb0          EEPROM Version: 0x01
P/N:             710-024027      S/N:            DX0282
Assembly ID:     0x096c          Assembly Version: 01.03
Date:           02-10-2009      Assembly Flags: 0x00
Version:         REV 03
ID: TXP FPM Display          FRU Model Number: CRAFT-TXP
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 01 ff 09 6c 01 03 52 45 56 20 30 33 00 00
  Address 0x10: 00 00 00 00 37 31 30 2d 30 32 34 30 32 37 00 00
  Address 0x20: 53 2f 4e 20 44 58 30 32 38 32 00 00 00 0a 02 07
  Address 0x30: d9 ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 00 00 00 00 00 00 00 00 00 00 43
  Address 0x50: 52 41 46 54 2d 54 58 50 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff

CIP 0             REV 04   710-023792   DW4889          TXP CIP
Jedec Code:      0x7fb0          EEPROM Version: 0x01
P/N:             710-023792      S/N:            DW4889
Assembly ID:     0x0969          Assembly Version: 01.04
Date:           01-26-2009      Assembly Flags: 0x00
Version:         REV 04
ID: TXP CIP          FRU Model Number: CIP-TXP
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff

```

### show chassis hardware clei-models (TX Matrix Plus Router)

```
user@host> show chassis hardware clei-models
```

```
sfc0-re0:
```

```
-----
Hardware inventory:
```

Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 05	710-022574		CHAS-BP-TXP-S
FPM Display	REV 03	710-024027		CRAFT-TXP-S
CIP 0	REV 05	710-023792		CIP-TXP-S
CIP 1	REV 05	710-023792		CIP-TXP-S
PEM 0	Rev 04	740-027463	IPUPAFGKTA	PWR-TXP-7-60-DC
PEM 1	Rev 04	740-027463	IPUPAFGKTA	PWR-TXP-7-60-DC

Routing Engine 0	REV 06	740-026942	RE-DUO-C2600-16G-S
Routing Engine 1	REV 06	740-026942	RE-DUO-C2600-16G-S
CB 0	REV 05	710-022606	CB-TXP-S
CB 1	REV 09	710-022606	CB-TXP-S
SIB F13 0	REV 04	750-024564	SIB-TXP-F13
SIB F13 3	REV 04	750-024564	SIB-TXP-F13
SIB F13 8	REV 04	750-024564	SIB-TXP-F13
SIB F13 11	REV 04	750-024564	SIB-TXP-F13
SIB F13 12	REV 03	750-024564	SIB-TXP-F13
SIB F2S 0/0	REV 05	710-022603	SIB-TXP-F2S-S
SIB F2S 0/2	REV 05	710-022603	SIB-TXP-F2S-S
SIB F2S 0/4	REV 04	710-022603	SIB-TXP-F2S-S
SIB F2S 0/6	REV 04	710-022603	SIB-TXP-F2S-S
SIB F2S 1/0	REV 04	710-022603	SIB-TXP-F2S-S
SIB F2S 1/2	REV 05	710-022603	SIB-TXP-F2S-S
SIB F2S 1/4	REV 04	710-022603	SIB-TXP-F2S-S
SIB F2S 1/6	REV 05	710-022603	SIB-TXP-F2S-S
SIB F2S 2/0	REV 04	710-022603	SIB-TXP-F2S-S
SIB F2S 2/2	REV 04	710-022603	SIB-TXP-F2S-S
SIB F2S 2/4	REV 05	710-022603	SIB-TXP-F2S-S
SIB F2S 2/6	REV 04	710-022603	SIB-TXP-F2S-S
SIB F2S 3/0	REV 05	710-022603	SIB-TXP-F2S-S
SIB F2S 3/2	REV 03	710-022603	SIB-TXP-F2S-S
SIB F2S 3/4	REV 05	710-022603	SIB-TXP-F2S-S
SIB F2S 3/6	REV 03	710-022603	SIB-TXP-F2S-S
SIB F2S 4/0	REV 03	710-022603	SIB-TXP-F2S-S
SIB F2S 4/2	REV 05	710-022603	SIB-TXP-F2S-S
SIB F2S 4/4	REV 04	710-022603	SIB-TXP-F2S-S
SIB F2S 4/6	REV 03	710-022603	SIB-TXP-F2S-S
Fan Tray 0	REV 02	760-024497	FANTRAY-TXP-H-S
Fan Tray 1	REV 02	760-024497	FANTRAY-TXP-H-S
Fan Tray 2	REV 05	760-024502	FANTRAY-TXP-V-S
Fan Tray 3			
Fan Tray 4	REV 05	760-024502	FANTRAY-TXP-V-S
Fan Tray 5	REV 02	760-024502	FANTRAY-TXP-V-S

1cc0-re0:

## Hardware inventory:

Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 03	710-017247		CHAS-BP-T1600-S
FPM Display	REV 01	710-021387		CRAFT-T1600-S
CIP	REV 06	710-002895		CIP-L-T640-S
PEM 1	Rev 02	740-023211	IPUPAC8KTA	PWR-T1600-4-60-DC-S
SCG 0	REV 15	710-003423		SCG-T-S
SCG 1	REV 15	710-003423		SCG-T-S
Routing Engine 0	REV 01	740-026941		RE-DUO-C1800-8G-S
Routing Engine 1	REV 01	740-026941		RE-DUO-C1800-8G-S
CB 0	REV 06	710-022597		CB-LCC-S
CB 1	REV 06	710-022597		CB-LCC-S
FPC 1	REV 07	710-013035		T640-FPC3-ES
PIC 0	REV 05	750-015217		PC-8GE-TYPE3-SFP-IQ2
PIC 1	REV 03	750-004424		PC-1XGE-LR
PIC 2	REV 01	750-003336		PC-40C48-SON-SMSR
FPC 3	REV 12	710-013037		T1600-FPC4-ES
PIC 0	REV 02	750-010850		PD-10C768-SON-SR
FPC 4	REV 05	710-021534		T640-FPC1-ES
PIC 0	REV 04	750-014627		PB-40C3-10C12-SON-SFP
PIC 1	REV 22	750-005634		PB-1CHOC12SMIR-QPP
PIC 2	REV 09	750-002911		PB-4FE-TX

PIC 3	REV 08	750-021652	PB-1CH0C12-STM4-IQE-SFP
FPC 5	REV 07	710-007529	T640-FPC3
PIC 0	REV 14	750-009567	PC-1XGE-XENPAK
PIC 1	REV 16	750-007141	PC-10GE-SFP
PIC 2	REV 12	750-009567	PC-1XGE-XENPAK
FPC 6	REV 07	710-013035	T640-FPC3-ES
PIC 0	REV 09	750-009567	PC-1XGE-XENPAK
PIC 1	REV 06	750-015217	PC-8GE-TYPE3-SFP-IQ2
PIC 2	REV 06	750-015217	PC-8GE-TYPE3-SFP-IQ2
FPC 7	REV 03	710-021540	T640-FPC2-ES
PIC 0	REV 13	750-001901	PB-40C12-SON-SMIR
PIC 1	REV 05	750-001900	PB-10C48-SON-SMSR
PIC 2	REV 10	750-008155	PB-2GE-SFP-QPP
PIC 3	REV 03	750-014638	PB-10C48-SON-B-SFP
SIB 0	REV 07	710-022594	SIB-TXP-T1600-S
SIB 1	REV 07	710-022594	SIB-TXP-T1600-S
SIB 3	REV 06	710-022594	SIB-TXP-T1600-S
SIB 4	REV 08	710-022594	SIB-TXP-T1600-S
Fan Tray 0			FANTRAY-T-S
Fan Tray 1			FANTRAY-T-S
Fan Tray 2			FANTRAY-TXP-R-S

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lcc1-re0:
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Hardware inventory:
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Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 04	710-017247		CHAS-BP-T1600-S
FPM Display	REV 01	710-021387		CRAFT-T1600-S
CIP	REV 06	710-002895		CIP-L-T640-S
PEM 0	Rev 02	740-023211	IPUPAC8KTA	PWR-T1600-4-60-DC-S
SCG 0	REV 15	710-003423		SCG-T-S
SCG 1	REV 15	710-003423		SCG-T-S
Routing Engine 0	REV 01	740-026941		RE-DUO-C1800-8G-S
Routing Engine 1	REV 01	740-026941		RE-DUO-C1800-8G-S
CB 0	REV 06	710-022597		CB-LCC-S
CB 1	REV 06	710-022597		CB-LCC-S
FPC 0	REV 02	710-010845		T640-FPC4-ES
PIC 0	REV 11	750-017405		PD-4XGE-XFP
FPC 1	REV 16	710-013037		T1600-FPC4-ES
PIC 1	REV 06	750-034781		PD-1CE-CFP
FPC 2	REV 16	710-013037		T1600-FPC4-ES
PIC 1	REV 05	750-034781		PD-1CE-CFP
FPC 3	REV 10	710-021534		T640-FPC1-ES
PIC 0	REV 13	750-012266		PB-4GE-TYPE1-SFP-IQ2
PIC 1	REV 01	750-007641		PE-1GE-SFP-QPP
PIC 3	REV 17	750-007444		PB-1CHSTM1-SMIR-QPP
FPC 4	REV 06	710-013035		T640-FPC3-ES
PIC 0	REV 22	750-007141		PC-10GE-SFP
PIC 1	REV 16	750-009450		PC-10C192-SON-SR2
PIC 2	REV 05	750-004424		PC-1XGE-LR
PIC 3	REV 12	750-013423		PC-MS-500-3
FPC 5	REV 07	710-013560		T640-FPC3-E2
PIC 0	REV 11	750-012793		PC-1XGE-TYPE3-XFP-IQ2
PIC 1	REV 01	750-004695		PC-TUNNEL
PIC 2	REV 32	750-003700		PC-10C192-SON-VSR
PIC 3	REV 12	750-009553		PC-40C48-SON-SFP
FPC 6	REV 07	710-013035		T640-FPC3-ES
PIC 0	REV 07	750-015217		PC-8GE-TYPE3-SFP-IQ2
PIC 1	REV 03	750-003336		PC-40C48-SON-SMSR
PIC 3	REV 02	750-012793		PC-1XGE-TYPE3-XFP-IQ2

FPC 7	REV 08	710-010845	T640-FPC4-ES
PIC 0	REV 11	750-017405	PD-4XGE-XFP
SIB 0	REV 07	710-022594	SIB-TXP-T1600-S
SIB 1	REV 07	710-022594	SIB-TXP-T1600-S
SIB 3	REV 07	710-022594	SIB-TXP-T1600-S
SIB 4	REV 08	710-022594	SIB-TXP-T1600-S
Fan Tray 0			FANTRAY-T-S
Fan Tray 1			FANTRAY-T-S
Fan Tray 2			FANTRAY-TXP-R-S

### show chassis hardware detail (TX Matrix Plus Router)

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user@host> show chassis hardware detail
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sfc0-re0:
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Hardware inventory:
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Item	Version	Part number	Serial number	Description
Chassis			JN111B023AHB	TXP
Midplane	REV 01	710-022574	TR7990	SFC Midplane
FPM Display	REV 03	710-024027	DW4699	TXP FPM Display
CIP 0	REV 01	710-023792	DR1437	TXP CIP
CIP 1	REV 02	710-023792	DS4564	TXP CIP
PEM 0	Rev 07	740-027463	UM26360	Power Entry Module
Routing Engine 0	REV 01	740-026942	737A-1024	SFC RE
ad0	3887 MB	SMART CF	200811050193CEB1CEB1	Compact Flash
ad1	30533 MB	SAMSUNG MCBQE32G8MPP-0V	SY814A0762	Disk 1
Routing Engine 1	REV 01	740-026942	737A-1024	SFC RE
ad0	3887 MB	SMART CF	20081105004C19A019A0	Compact Flash
ad1	30533 MB	SAMSUNG MCBQE32G8MPP-0V	SY814A0794	Disk 1
CB 0	REV 03	710-022606	DR7134	SFC Control Board
CB 1	REV 01	710-022606	DP8890	SFC Control Board
SPMB 0		BUILTIN		SFC Switch CPU
SPMB 1		BUILTIN		SFC Switch CPU
SIB F13 0	REV 03	750-024564	DT9478	F13 SIB
B Board	REV 02	710-023431	DT6554	F13 SIB
SIB F13 1	REV 03	750-024564	DT9454	F13 SIB
B Board	REV 02	710-023431	DT6551	F13 SIB
SIB F2S 0/0	REV 02	710-022603	DT2838	F2S SIB
B Board	REV 02	710-023787	DT1725	NEO PMB
SIB F2S 0/2	REV 02	710-022603	DT2824	F2S SIB
B Board	REV 02	710-023787	DT1706	NEO PMB
SIB F2S 0/4	REV 02	710-022603	DT2822	F2S SIB
B Board	REV 02	710-023787	DT1696	NEO PMB
SIB F2S 0/6	REV 02	710-022603	DT2823	F2S SIB
B Board	REV 02	710-023787	DT1717	NEO PMB
SIB F2S 1/0	REV 03	710-022603	DV0059	F2S SIB
B Board	REV 03	710-023787	DT9942	NEO PMB
SIB F2S 1/2	REV 02	710-022603	DT2826	F2S SIB
B Board	REV 02	710-023787	DT1713	NEO PMB
SIB F2S 1/4	REV 03	710-022603	DV0092	F2S SIB
B Board	REV 03	710-023787	DV0000	NEO PMB
SIB F2S 1/6	REV 03	710-022603	DV0079	F2S SIB
B Board	REV 03	710-023787	DT9972	NEO PMB
SIB F2S 2/0	REV 03	710-022603	DV0100	F2S SIB
B Board	REV 03	710-023787	DT9925	NEO PMB
SIB F2S 2/2	REV 03	710-022603	DV0050	F2S SIB
B Board	REV 03	710-023787	DV0005	NEO PMB
SIB F2S 2/4	REV 03	710-022603	DV0097	F2S SIB
B Board	REV 03	710-023787	DT9936	NEO PMB



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Fan Tray 0      REV 02  760-024497  DR8286      Front Fan Tray
Fan Tray 1      REV 06  760-024497  DV9624      Front Fan Tray
Fan Tray 2      REV 02  760-024502  DR8259      Rear Fan Tray
Fan Tray 3      REV 02  760-024502  DR8270      Rear Fan Tray
Fan Tray 4      REV 02  760-024502  DR8284      Rear Fan Tray
Fan Tray 5      REV 06  760-024502  DV7813      Rear Fan Tray

lcc0-re0:
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Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis                               JN1101F27AHA  T1600
Midplane      REV 04   710-017247  RC5317        T Series Backplane
FPM GBUS      REV 10   710-002901  DS8197        T640 FPM Board
FPM Display   REV 01   710-021387  DS6433        T1600 FPM Display
CIP           REV 06   710-002895  DS1493        T Series CIP
PEM 0        Rev 08   740-017906  UD26601       Power Entry Module 3x80
SCG 0        REV 15   710-003423  DP5847        T640 Sonet Clock Gen.
SCG 1        REV 15   710-003423  DR0924        T640 Sonet Clock Gen.
Routing Engine 0 REV 01   740-026942  737F-1024     LCC RE
  ad0 3887 MB SMART CF 2008110502B63E513E51 Compact Flash
  ad1 30533 MB SAMSUNG MCBQE32G8MPP-0V SY814A1208 Disk 1
Routing Engine 1 REV 01   740-026942  737F-1024     LCC RE
  ad0 3887 MB SMART CF 2008110500F9A8A8A8A8 Compact Flash
  ad1 30533 MB SAMSUNG MCBQE32G8MPP-0V SY814A1076 Disk 1
CB 0          REV 05   710-022597  DV4264        LCC Control Board
CB 1          REV 03   710-022597  DP8558        LCC Control Board
FPC 0         REV 14   710-013037  DS9967        FPC Type 4-ES
  CPU         REV 08   710-016744  DS3989        ST-PMB2
  PIC 0        REV 12   750-013198  DL7506        1x Tunnel
  PIC 1        REV 12   750-013198  DL7505        1x Tunnel
  MMB 0        REV 01   710-025563  DS8524        ST-MMB2
  MMB 1        REV 01   710-025563  DS8373        ST-MMB2
FPC 1         REV 14   710-013037  DT0027        FPC Type 4-ES
  CPU         REV 09   710-016744  DS7684        ST-PMB2
  PIC 0        REV 12   750-013198  DL7512        1x Tunnel
  PIC 1        REV 12   750-013198  DL7498        1x Tunnel
  MMB 0        REV 01   710-025563  DS8494        ST-MMB2
  MMB 1        REV 01   710-025563  DS8436        ST-MMB2
SPMB 0        REV 04   710-023321  DV3867        LCC Switch CPU
SPMB 1        REV 02   710-023321  DP0238        LCC Switch CPU
SIB 0         REV 06   710-022594  DT8268        LCC SIB
  B Board     REV 06   710-023185  DT5791        LCC SIB Mezz
SIB 1         REV 06   710-022594  DT8261        LCC SIB
  B Board     REV 06   710-023185  DT5769        LCC SIB Mezz
SIB 2         REV 04   710-022594  DS2315        LCC SIB
  B Board     REV 06   710-023185  DT5788        LCC SIB Mezz
SIB 3         REV 06   710-022594  DT8253        LCC SIB
  B Board     REV 06   710-023185  DT5811        LCC SIB Mezz
SIB 4         REV 06   710-022594  DT8248        LCC SIB
  B Board     REV 06   710-023185  DT5812        LCC SIB Mezz
Fan Tray 0    Front Top Fan Tray
Fan Tray 1    Front Bottom Fan Tray
Fan Tray 2    Rear Fan Tray

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### show chassis hardware models (TX Matrix Plus Router)

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user@host> show chassis hardware models
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## sfc0-re0:

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Hardware inventory:

Item	Version	Part number	Serial number	FRU model number
FPM Display	REV 03	710-024027	DX0282	CRAFT-TXP
CIP 0	REV 04	710-023792	DW4889	CIP-TXP
CIP 1	REV 04	710-023792	DW4887	CIP-TXP
PEM 0	Rev 07	740-027463	UM26368	yyyyyyyyyyyyyyyyyyyyyyyyyy
Routing Engine 0	REV 01	740-026942	737A-1064	RE-TXP-SFC-DUO-2600-16G
Routing Engine 1	REV 01	740-026942	737A-1082	RE-TXP-SFC-DUO-2600-16G
CB 0	REV 09	710-022606	DW6099	CB-TXP
CB 1	REV 09	710-022606	DW6096	CB-TXP
SIB F13 1	REV 04	750-024564	DW5776	SIB-TXP-F13
SIB F13 3	REV 04	750-024564	DW5762	SIB-TXP-F13
SIB F13 4	REV 04	750-024564	DW5797	SIB-TXP-F13
SIB F13 6	REV 04	750-024564	DW5770	SIB-TXP-F13
SIB F13 7	REV 04	750-024564	DW5758	SIB-TXP-F13
SIB F13 8	REV 04	750-024564	DW5761	SIB-TXP-F13
SIB F13 9	REV 04	750-024564	DW5754	SIB-TXP-F13
SIB F13 12	REV 04	750-024564	DW5794	SIB-TXP-F13
SIB F2S 0/0	REV 05	710-022603	DW7897	
SIB F2S 0/2	REV 05	710-022603	DW7833	
SIB F2S 0/4	REV 05	710-022603	DW7875	
SIB F2S 0/6	REV 05	710-022603	DW7860	
SIB F2S 1/0	REV 04	710-022603	DW4820	
SIB F2S 1/2	REV 05	710-022603	DW7849	
SIB F2S 1/4	REV 05	710-022603	DW7927	SIB-TXP-F2S
SIB F2S 1/6	REV 05	710-022603	DW7866	
SIB F2S 2/0	REV 05	710-022603	DW7880	
SIB F2S 2/2	REV 05	710-022603	DW7895	
SIB F2S 2/4	REV 05	710-022603	DW7907	
SIB F2S 2/6	REV 05	710-022603	DW7785	
SIB F2S 3/0	REV 05	710-022603	DW7782	
SIB F2S 3/2	REV 05	710-022603	DW7793	
SIB F2S 3/4	REV 05	710-022603	DW7779	
SIB F2S 3/6	REV 05	710-022603	DW7930	
SIB F2S 4/0	REV 05	710-022603	DW7867	
SIB F2S 4/2	REV 05	710-022603	DW7917	
SIB F2S 4/4	REV 05	710-022603	DW7929	
SIB F2S 4/6	REV 05	710-022603	DW7870	
Fan Tray 0	REV 06	760-024497	DV7831	FANTRAY-TXP-F
Fan Tray 1	REV 06	760-024497	DV9614	FANTRAY-TXP-F
Fan Tray 2	REV 06	760-024502	DV9618	FANTRAY-TXP-R
Fan Tray 3	REV 06	760-024502	DV9616	FANTRAY-TXP-R
Fan Tray 4	REV 06	760-024502	DV7807	FANTRAY-TXP-R
Fan Tray 5	REV 06	760-024502	DV7828	FANTRAY-TXP-R

## lcc0-re0:

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Hardware inventory:

Item	Version	Part number	Serial number	FRU model number
Midplane	REV 03	710-017247	RC3765	CHAS-BP-T1600-S
FPM Display	REV 01	710-021387	DN5441	CRAFT-T1600-S
CIP	REV 06	710-002895	DP6021	CIP-L-T640-S
PEM 0	Rev 07	740-017906	UA26384	PWR-T1600-3-80-DC-S
PEM 1	Rev 07	740-017906	UA26296	PWR-T1600-3-80-DC-S
SCG 0	REV 15	710-003423	DR0875	SCG-T-S
CB 0	REV 06	710-022597	DW8534	CB-LCC
CB 1	REV 06	710-022597	DW8527	CB-LCC
FPC 4	REV 12	710-013037	DJ8717	T1600-FPC4-ES

PIC 0	REV 11	750-017405	DP8795	PD-4XGE-XFP
PIC 1	REV 11	750-017405	DP8794	PD-4XGE-XFP
FPC 6	REV 14	710-013037	DS5335	T1600-FPC4-ES
PIC 0	REV 13	750-017405	DS7634	PD-4XGE-XFP
PIC 1	REV 13	750-017405	DS7637	PD-4XGE-XFP
FPC 7	REV 07	710-013035	DM0990	T1600-FPC3-ES
PIC 0	REV 16	750-007141	JJ8067	PC-10GE-SFP
PIC 1	REV 08	750-015749	WE9598	PC-10C192-SON-XFP
PIC 2	REV 10	750-009450	HX6466	PC-10C192-SON-SR2
SIB 0	REV 08	710-022594	DW8033	SIB-TXP-T1600-S
SIB 1	REV 08	710-022594	DW8044	SIB-TXP-T1600-S
SIB 2	REV 08	710-022594	DW8020	SIB-TXP-T1600-S
SIB 3	REV 08	710-022594	DW8063	SIB-TXP-T1600-S
SIB 4	REV 08	710-022594	DW8064	SIB-TXP-T1600-S
Fan Tray 0				FANTRAY-T-S
Fan Tray 1				FANTRAY-T-S
Fan Tray 2				FANTRAY-TXP-R-S

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lcc1-re0:
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Hardware inventory:
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Item	Version	Part number	Serial number	FRU model number
Midplane	REV 04	710-017247	RC5361	CHAS-BP-T1600-S
FPM Display	REV 01	710-021387	DS6430	CRAFT-T1600-S
CIP	REV 06	710-002895	DS4239	CIP-L-T640-S
PEM 0	Rev 08	740-017906	UD26649	PWR-T1600-3-80-DC-S
SCG 0	REV 15	710-003423	DP5820	SCG-T-S
CB 0	REV 06	710-022597	DW8523	CB-LCC
CB 1	REV 06	710-022597	DW8528	CB-LCC
FPC 4	REV 12	710-013037	DP8509	T1600-FPC4-ES
PIC 0	REV 11	750-017405	DP8808	PD-4XGE-XFP
PIC 1	REV 11	750-017405	DP7263	PD-4XGE-XFP
FPC 6	REV 14	710-013037	DS9961	T1600-FPC4-ES
PIC 0	REV 13	750-017405	DS5532	PD-4XGE-XFP
PIC 1	REV 13	750-017405	DS7639	PD-4XGE-XFP
FPC 7	REV 03	710-013035	DF5564	T1600-FPC3-ES
PIC 0	REV 16	750-007141	JJ8063	PC-10GE-SFP
SIB 0	REV 08	710-022594	DW8035	SIB-TXP-T1600-S
SIB 1	REV 10	710-022594	DX7672	SIB-TXP-T1600-S
SIB 2	REV 08	710-022594	DW8060	SIB-TXP-T1600-S
SIB 3	REV 08	710-022594	DW8072	SIB-TXP-T1600-S
SIB 4	REV 08	710-022594	DW8043	SIB-TXP-T1600-S
Fan Tray 0				FANTRAY-T-S
Fan Tray 1				FANTRAY-T-S
Fan Tray 2				FANTRAY-TXP-R-S

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lcc2-re0:
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Hardware inventory:
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Item	Version	Part number	Serial number	FRU model number
Midplane	REV 03	710-017247	RC3956	CHAS-BP-T1600-S
FPM Display	REV 01	710-021387	DN7030	CRAFT-T1600-S
CIP	REV 06	710-002895	DM3962	CIP-L-T640-S
PEM 0	Rev 08	740-017906	UD26519	PWR-T1600-3-80-DC-S
PEM 1	Rev 07	740-017906	UC26601	PWR-T1600-3-80-DC-S
SCG 0	REV 15	710-003423	DP0277	SCG-T-S
CB 0	REV 06	710-022597	DW8524	CB-LCC
CB 1	REV 06	710-022597	DW8536	CB-LCC
FPC 4	REV 12	710-013037	DR1194	T1600-FPC4-ES
PIC 0	REV 11	750-017405	DP8811	PD-4XGE-XFP

PIC 1	REV 11	750-017405	DP8823	PD-4XGE-XFP
FPC 5	REV 12	710-013037	DR1184	T1600-FPC4-ES
PIC 1	REV 11	750-017405	DP4744	PD-4XGE-XFP
FPC 6	REV 12	710-013037	DN8622	T1600-FPC4-ES
PIC 0	REV 14	750-012518	JY9924	PD-40C192-SON-XFP
PIC 1	REV 11	750-017405	DP8776	PD-4XGE-XFP
FPC 7	REV 04	710-013560	JR3968	T640-FPC3-E2
PIC 0	REV 16	750-007141	NC9330	PC-10GE-SFP
SIB 0	REV 07	710-022594	DW4217	SIB-TXP-T1600-S
SIB 1	REV 07	710-022594	DW4213	SIB-TXP-T1600-S
SIB 2	REV 07	710-022594	DW4189	SIB-TXP-T1600-S
SIB 3	REV 07	710-022594	DW4173	SIB-TXP-T1600-S
SIB 4	REV 07	710-022594	DW4201	SIB-TXP-T1600-S
Fan Tray 0				FANTRAY-T-S
Fan Tray 1				FANTRAY-T-S
Fan Tray 2				FANTRAY-TXP-R-S

lcc3-re0:

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Hardware inventory:

Item	Version	Part number	Serial number	FRU model number
Midplane	REV 04	710-017247	RC5319	CHAS-BP-T1600-S
FPM Display	REV 01	710-021387	DS6402	CRAFT-T1600-S
CIP	REV 06	710-002895	DR9973	CIP-L-T640-S
PEM 0	Rev 07	740-017906	UC26496	PWR-T1600-3-80-DC-S
PEM 1	Rev 07	740-017906	UC26599	PWR-T1600-3-80-DC-S
SCG 0	REV 15	710-003423	DP5831	SCG-T-S
CB 0	REV 06	710-022597	DW8533	CB-LCC
CB 1	REV 06	710-022597	DW8538	CB-LCC
FPC 0	REV 14	710-013037	DS5345	T1600-FPC4-ES
PIC 0	REV 13	750-017405	DS7641	PD-4XGE-XFP
PIC 1	REV 13	750-017405	DS5479	PD-4XGE-XFP
FPC 1	REV 14	710-013037	DS7338	T1600-FPC4-ES
PIC 0	REV 13	750-017405	DS7631	PD-4XGE-XFP
PIC 1	REV 13	750-017405	DS7632	PD-4XGE-XFP
FPC 2	REV 14	710-013037	DS9962	T1600-FPC4-ES
PIC 0	REV 13	750-017405	DS7581	PD-4XGE-XFP
PIC 1	REV 13	750-017405	DS7627	PD-4XGE-XFP
FPC 4	REV 10	710-010845	JZ6573	T640-FPC4-ES
PIC 0	REV 14	750-012518	JT5124	PD-40C192-SON-XFP
FPC 5	REV 14	710-013037	DT0016	T1600-FPC4-ES
PIC 0	REV 14	750-012518	JY9918	PD-40C192-SON-XFP
FPC 7	REV 07	710-013035	DM0967	T1600-FPC3-ES
PIC 0	REV 16	750-007141	JJ8059	PC-10GE-SFP
PIC 1	REV 13	750-004695	DM5712	PC-TUNNEL
SIB 0	REV 07	710-022594	DW4174	SIB-TXP-T1600-S
SIB 1	REV 07	710-022594	DW4207	SIB-TXP-T1600-S
SIB 2	REV 06	710-022594	DT8231	SIB-TXP-T1600-S
SIB 3	REV 07	710-022594	DW4175	SIB-TXP-T1600-S
SIB 4	REV 07	710-022594	DW4209	SIB-TXP-T1600-S
Fan Tray 0				FANTRAY-T-S
Fan Tray 1				FANTRAY-T-S
Fan Tray 2				FANTRAY-TXP-R-S

## show chassis hardware (TX Matrix Plus Router with 3D SIBs)

user@host&gt; show chassis hardware

sfc0-re0:  
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## Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN11CAAA4AHB	TXP
Midplane	REV 05	710-022574	ABAC4696	SFC Midplane
FPM Display	REV 09	710-024027	EH3138	TXP FPM Display
CIP 0	REV 12	710-023792	EF6349	TXP CIP
CIP 1	REV 12	710-023792	EG5294	TXP CIP
PEM 0	Rev 06	740-027463	XH04595	Power Entry Module
PEM 1	Rev 06	740-027463	XH04592	Power Entry Module
Routing Engine 0	REV 07	740-026942	P737A-002541	RE-DUO-2600
Routing Engine 1	REV 07	740-026942	P737A-002602	RE-DUO-2600
CB 0	REV 15	710-022606	EH4376	SFC Control Board
CB 1	REV 15	710-022606	EH4379	SFC Control Board
SPMB 0		BUILTIN		SFC Switch CPU
SPMB 1		BUILTIN		SFC Switch CPU
SIB F13 0	REV 10	750-035002	EM9305	F13 SIB 3D
B Board	REV 06	711-035082	EM9667	F13 SIB 3D Mezz
P Board	REV 05	711-043544	EM9708	F13 SIB 3D Power
Xcvr 0	REV 01	740-047547	XB34FB00S	CXP Module
Xcvr 2	REV 01	740-047547	XB48FB01H	CXP Module
Xcvr 4	REV 01	740-047547	XB34FB02W	CXP Module
Xcvr 6	REV 01	740-047547	XB34FB01T	CXP Module
Xcvr 8	REV 01	740-047547	XB48FB00W	CXP Module
Xcvr 10	REV 01	740-047547	XB34FB01S	CXP Module
Xcvr 12	REV 01	740-047547	XB34FB03H	CXP Module
Xcvr 14	REV 01	740-047547	XB34FB023	CXP Module
SIB F13 3	REV 01	710-035001	EJ2612	F13 SIB 3D
B Board	REV 01	711-035082	EJ3815	F13 SIB 3D Mezz
P Board	REV 01	711-043544	EJ2678	F13 SIB 3D Power
Xcvr 0	REV 01	740-047547	XB48FB04C	CXP Module
Xcvr 2	REV 01	740-047547	XB48FB00Z	CXP Module
Xcvr 4	REV 01	740-047547	XB47FB036	CXP Module
Xcvr 6	REV 01	740-047547	XB47FB029	CXP Module
Xcvr 8	REV 01	740-047547	XB48FB02N	CXP Module
Xcvr 10	REV 01	740-047547	XB42FB0CS	CXP Module
Xcvr 12	REV 01	740-047547	XB47FB01X	CXP Module
Xcvr 14	REV 01	740-047547	XB48FB02F	CXP Module
SIB F13 6	REV 05	750-035002	EK2675	F13 SIB 3D
B Board	REV 03	711-035082	EK2612	F13 SIB 3D Mezz
P Board	REV 04	711-043544	EK1179	F13 SIB 3D Power
Xcvr 0	REV 01	740-047547	XB48FB01T	CXP Module
Xcvr 2	REV 01	740-047547	XB48FB02M	CXP Module
Xcvr 4	REV 01	740-047547	XB48FB031	CXP Module
Xcvr 6	REV 01	740-047547	XB48FB04P	CXP Module
Xcvr 8	REV 01	740-047547	XB48FB02T	CXP Module
Xcvr 10	REV 01	740-047547	XB34FB01V	CXP Module
Xcvr 12	REV 01	740-047547	XB48FB02C	CXP Module
Xcvr 14		NON-JNPR		No Module
SIB F13 12	REV 01	710-035001	EJ2631	F13 SIB 3D
B Board	REV 01	711-035082	EJ3808	F13 SIB 3D Mezz
P Board	REV 01	711-043544	EJ2676	F13 SIB 3D Power
SIB F2S 0/0	REV 01	711-034977	EH9829	F2S SIB 3D
B Board	REV 01	711-034979	EH9927	F2S SIB 3D Mezz
SIB F2S 0/2	REV 01	711-034977	EH9791	F2S SIB 3D
B Board	REV 01	711-034979	EH9852	F2S SIB 3D Mezz
SIB F2S 0/4	REV 01	711-034977	EH9803	F2S SIB 3D
B Board	REV 01	711-034979	EH9915	F2S SIB 3D Mezz
SIB F2S 0/6	REV 01	711-034977	EH9763	F2S SIB 3D
B Board	REV 01	711-034979	EH9880	F2S SIB 3D Mezz
SIB F2S 1/0	REV 01	711-034977	EH9757	F2S SIB 3D

B Board	REV 01	711-034979	EH9889	F2S SIB 3D Mezz
SIB F2S 1/2	REV 01	711-034977	EH9815	F2S SIB 3D
B Board	REV 01	711-034979	EH9890	F2S SIB 3D Mezz
SIB F2S 1/4	REV 08	750-034978	EN1954	F2S SIB 3D
B Board	REV 02	711-034979	EN1436	F2S SIB 3D Mezz
SIB F2S 1/6	REV 01	711-034977	EJ7054	F2S SIB 3D
B Board	REV 01	711-034979	EJ8238	F2S SIB 3D Mezz
SIB F2S 2/0	REV 01	711-034977	EH9830	F2S SIB 3D
B Board	REV 01	711-034979	EH9844	F2S SIB 3D Mezz
SIB F2S 2/2	REV 01	711-034977	EH9818	F2S SIB 3D
B Board	REV 01	711-034979	EH9888	F2S SIB 3D Mezz
SIB F2S 2/4	REV 01	711-034977	EH9795	F2S SIB 3D
B Board	REV 01	711-034979	EH9869	F2S SIB 3D Mezz
SIB F2S 2/6	REV 01	711-034977	EJ7026	F2S SIB 3D
B Board	REV 01	711-034979	EJ8273	F2S SIB 3D Mezz
SIB F2S 3/0	REV 01	711-034977	EH9811	F2S SIB 3D
B Board	REV 01	711-034979	EH9892	F2S SIB 3D Mezz
SIB F2S 3/2	REV 01	711-034977	EH9812	F2S SIB 3D
B Board	REV 01	711-034979	EH9877	F2S SIB 3D Mezz
SIB F2S 3/4	REV 08	750-034978	EN1947	F2S SIB 3D
B Board	REV 02	711-034979	EN1471	F2S SIB 3D Mezz
Fan Tray 0	REV 10	760-024497	EH3313	Front Fan Tray
Fan Tray 1	REV 10	760-024497	EH3290	Front Fan Tray
Fan Tray 2	REV 10	760-024502	EH3292	Rear Fan Tray
Fan Tray 3	REV 10	760-024502	EH3287	Rear Fan Tray
Fan Tray 4	REV 10	760-024502	EH3286	Rear Fan Tray
Fan Tray 5	REV 10	760-024502	EH3285	Rear Fan Tray

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Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN11B23FEAHA	T1600
Midplane	REV 01	710-027486	RC9787	T-series Backplane
FPM GBUS	REV 13	710-002901	BBAG5132	T640 FPM Board
FPM Display	REV 04	710-021387	BBAL9612	T1600 FPM Display
CIP	REV 06	710-002895	BBAN0605	T-series CIP
PEM 0	REV 05	740-036442	1G022060143	Power Entry Module 6x60
PEM 1	REV 05	740-036442	1G022060011	Power Entry Module 6x60
SCG 0	REV 18	710-003423	BBAL7318	T640 Sonet Clock Gen.
SCG 1	REV 18	710-003423	BBAL7255	T640 Sonet Clock Gen.
Routing Engine 0	REV 07	740-026941	P737F-002933	RE-DUO-1800
Routing Engine 1	REV 06	740-026941	P737F-002749	RE-DUO-1800
CB 0	REV 11	710-022597	EH3611	LCC Control Board
CB 1	REV 11	710-022597	EH4798	LCC Control Board
FPC 5	REV 17	710-013037	BBAC5333	FPC Type 4-ES
CPU	REV 10	710-016744	BBAB7619	ST-PMB2
PIC 0	REV 18	750-017405	BBAE3420	4x 10GE (LAN/WAN) XFP
Xcvr 0	REV 03	740-014289	T10C90659	XFP-10G-SR
MMB 0	REV 05	710-025563	BBAB9538	ST-MMB2
MMB 1	REV 05	710-025563	BBAB9502	ST-MMB2
FPC 7	REV 01	750-045173	BBAV0032	FPC Type 5-3D
CPU				
SPMB 0	REV 05	710-023321	EG9434	LCC Switch CPU
SPMB 1	REV 05	710-023321	EH3878	LCC Switch CPU
SIB 0	REV 01	750-041657	EH7997	LCC SIB 3D
B Board	REV 01	711-042424	EH7674	LCC SIB 3D Mezz
Xcvr 0	REV 01	740-047547	XB48FB014	CXP Module
Xcvr 2	REV 01	740-047547	XB48FB05A	CXP Module
Xcvr 4	REV 01	740-047547	XB48FB052	CXP Module

Xcvr 6	REV 01	740-047547	XB48FB01B	CXP Module
SIB 1	REV 01	750-041657	EH8023	LCC SIB 3D
B Board	REV 01	711-042424	EH7659	LCC SIB 3D Mezz
Xcvr 0	REV 01	740-047547	XB48FB05J	CXP Module
Xcvr 2	REV 01	740-047547	XB48FB01E	CXP Module
Xcvr 4	REV 01	740-047547	XB48FB01J	CXP Module
Xcvr 6	REV 01	740-047547	XB48FB02S	CXP Module
SIB 2	REV 03	750-041657	EJ6554	LCC SIB 3D
B Board	REV 02	711-042424	EJ5756	LCC SIB 3D Mezz
Xcvr 0	REV 01	740-047547	XB34FB01Z	CXP Module
Xcvr 2	REV 01	740-047547	XB34FB013	CXP Module
Xcvr 4	REV 01	740-047547	XB48FB04Z	CXP Module
Xcvr 6	REV 01	740-047547	XB48FB05N	CXP Module
Fan Tray 0				Front Top Fan Tray
Fan Tray 1				Front Bottom Fan Tray
Fan Tray 2				Rear Fan Tray -- Rev 4

lcc2-re0:

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Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN11B3975AHA	T1600
Midplane	REV 01	710-027486	RC9826	T-series Backplane
FPM GBUS	REV 13	710-002901	BBAG5124	T640 FPM Board
FPM Display	REV 03	710-021387	BBAJ1112	T1600 FPM Display
CIP	REV 06	710-002895	BBAL3744	T-series CIP
PEM 0	REV 05	740-036442	1G022060081	Power Entry Module 6x60
PEM 1	REV 05	740-036442	1G022060188	Power Entry Module 6x60
SCG 0	REV 18	710-003423	BBAH8775	T640 Sonet Clock Gen.
SCG 1	REV 18	710-003423	BBAL7272	T640 Sonet Clock Gen.
Routing Engine 0	REV 07	740-026941	P737F-002992	RE-DUO-1800
Routing Engine 1	REV 07	740-026941	P737F-002938	RE-DUO-1800
CB 0	REV 11	710-022597	EH4805	LCC Control Board
CB 1	REV 11	710-022597	EH4786	LCC Control Board
FPC 1	REV 01	710-033873	BBAH0320	FPC Type 3-ES
CPU	REV 11	710-016744	BBAF3281	ST-PMB2
MMB 0	REV 06	710-025563	BBAF5061	ST-MMB2
FPC 5	REV 04	710-033871	BBAM5070	FPC Type 4-ES
CPU	REV 11	710-016744	BBAM6653	ST-PMB2
PIC 1	REV 20	750-017405	BBAM1296	4x 10GE (LAN/WAN) XFP
Xcvr 0	REV 03	740-014289	T10B42981	XFP-10G-SR
MMB 0	REV 07	710-025563	BBAN2631	ST-MMB2
MMB 1	REV 07	710-025563	BBAN2538	ST-MMB2
SPMB 0	REV 05	710-023321	EH3903	LCC Switch CPU
SPMB 1	REV 05	710-023321	EH3902	LCC Switch CPU
SIB 0	REV 01	750-041657	EH8019	LCC SIB 3D
B Board	REV 01	711-042424	EH7680	LCC SIB 3D Mezz
Xcvr 0	REV 01	740-047547	XB48FB04F	CXP Module
Xcvr 2	REV 01	740-047547	XB48FB04S	CXP Module
Xcvr 4	REV 01	740-047547	XB48FB04B	CXP Module
Xcvr 6	REV 01	740-047547	XB48FB043	CXP Module
SIB 1	REV 01	750-041657	EH8012	LCC SIB 3D
B Board	REV 01	711-042424	EH7658	LCC SIB 3D Mezz
Xcvr 0	REV 01	740-047547	XB48FB05E	CXP Module
Xcvr 2	REV 01	740-047547	XB48FB01Z	CXP Module
Xcvr 4	REV 01	740-047547	XB48FB018	CXP Module
Xcvr 6	REV 01	740-047547	XB48FB054	CXP Module
SIB 2	REV 01	750-041657	EH7993	LCC SIB 3D
B Board	REV 01	711-042424	EH7678	LCC SIB 3D Mezz
Xcvr 0	REV 01	740-047547	XB48FB05C	CXP Module

Xcvr 2	REV 01	740-047547	XB47FB00N	CXP Module
Xcvr 4	REV 01	740-047547	XB48FB05U	CXP Module
Xcvr 6	REV 01	740-047547	XB48FB05L	CXP Module
Fan Tray 0				Front Top Fan Tray
Fan Tray 1				Front Bottom Fan Tray
Fan Tray 2				Rear Fan Tray -- Rev 4

### show chassis hardware clei-models (TX Matrix Plus Router with 3D SIBs)

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user@host> show chassis hardware clei-models
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sfc0-re0:
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Hardware inventory:

Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 05	710-022574		CHAS-BP-TXP-S
FPM Display	REV 09	710-024027		CRAFT-TXP-S
CIP 0	REV 12	710-023792		CIP-TXP-S
CIP 1	REV 12	710-023792		CIP-TXP-S
PEM 0	Rev 06	740-027463	IPUPAFGKTA	PWR-TXP-7-60-DC-S
Routing Engine 0	REV 07	740-026942		RE-DUO-C2600-16G-S
Routing Engine 1	REV 07	740-026942		RE-DUO-C2600-16G-S
CB 0	REV 13	710-022606		CB-TXP-S
CB 1	REV 14	710-022606		CB-TXP-S
SIB F13 0	REV 10	750-035002	PROTOXCLEI	SIB-TXP-3D-F13-S
Xcvr 0	REV 01	740-048813		
Xcvr 1	REV 01	740-048813		
Xcvr 2	REV 01	740-048813		
Xcvr 3	REV 01	740-048813		
Xcvr 4	REV 01	740-048813		
Xcvr 5	REV 01	740-048813		
Xcvr 6	REV 01	740-048813		
Xcvr 7	REV 01	740-048813		
Xcvr 8	REV 01	740-047547		CXP-TXP-3D
Xcvr 10	REV 01	740-047547		CXP-TXP-3D
Xcvr 12	REV 01	740-047547		CXP-TXP-3D
Xcvr 14	REV 01	740-047547		CXP-TXP-3D
SIB F13 1	REV 10	750-035002	PROTOXCLEI	SIB-TXP-3D-F13-S
Xcvr 0	REV 01	740-047547		CXP-TXP-3D
Xcvr 1	REV 01	740-047547		CXP-TXP-3D
Xcvr 2	REV 01	740-047547		CXP-TXP-3D
Xcvr 3	REV 01	740-047547		CXP-TXP-3D
Xcvr 4	REV 01	740-047547		CXP-TXP-3D
Xcvr 5	REV 01	740-047547		CXP-TXP-3D
Xcvr 6	REV 01	740-047547		CXP-TXP-3D
Xcvr 7	REV 01	740-047547		CXP-TXP-3D
Xcvr 8	REV 01	740-047547		CXP-TXP-3D
Xcvr 10	REV 01	740-047547		CXP-TXP-3D
Xcvr 12	REV 01	740-047547		CXP-TXP-3D
Xcvr 14	REV 01	740-047547		CXP-TXP-3D
Xcvr 0	REV 01	740-048813		
Xcvr 1	REV 01	740-048813		
Xcvr 2	REV 01	740-048813		
Xcvr 3	REV 01	740-048813		
Xcvr 4	REV 01	740-048813		
Xcvr 5	REV 01	740-048813		
Xcvr 6	REV 01	740-048813		
Xcvr 7	REV 01	740-048813		
Xcvr 8	REV 01	740-048813		
Xcvr 10	REV 01	740-048813		



Xcvr 12	REV 01	740-048813		
Xcvr 14	REV 01	740-048813		
Xcvr 0	REV 01	740-047547		CXP-TXP-3D
Xcvr 1	REV 01	740-047547		CXP-TXP-3D
Xcvr 2	REV 01	740-047547		CXP-TXP-3D
Xcvr 3	REV 01	740-047547		CXP-TXP-3D
Xcvr 4	REV 01	740-047547		CXP-TXP-3D
Xcvr 5	REV 01	740-047547		CXP-TXP-3D
Xcvr 6	REV 01	740-047547		CXP-TXP-3D
Xcvr 7	REV 01	740-047547		CXP-TXP-3D
Xcvr 8	REV 01	740-047547		CXP-TXP-3D
Xcvr 10	REV 01	740-047547		CXP-TXP-3D
Xcvr 12	REV 01	740-047547		CXP-TXP-3D
Xcvr 14	REV 01	740-047547		CXP-TXP-3D
SIB F13 6	REV 16	750-035002	PROTOXCLEI	SIB-TXP-3D-F13
Xcvr 0	REV 01	740-048813		
Xcvr 1	REV 01	740-048813		
Xcvr 2	REV 01	740-048813		
Xcvr 3	REV 01	740-048813		
Xcvr 4	REV 01	740-048813		
Xcvr 5	REV 01	740-048813		
Xcvr 6	REV 01	740-048813		
Xcvr 7	REV 01	740-048813		
Xcvr 8	REV 01	740-047547		CXP-TXP-3D
Xcvr 10	REV 01	740-047547		CXP-TXP-3D
Xcvr 12	REV 01	740-047547		CXP-TXP-3D
Xcvr 14	REV 01	740-047547		CXP-TXP-3D
SIB F13 7	REV 10	750-035002	PROTOXCLEI	SIB-TXP-3D-F13-S
Xcvr 0	REV 01	740-047547		CXP-TXP-3D
Xcvr 1	REV 01	740-047547		CXP-TXP-3D
Xcvr 2	REV 01	740-047547		CXP-TXP-3D
Xcvr 3	REV 01	740-047547		CXP-TXP-3D
Xcvr 4	REV 01	740-047547		CXP-TXP-3D
Xcvr 5	REV 01	740-047547		CXP-TXP-3D
Xcvr 6	REV 01	740-047547		CXP-TXP-3D
Xcvr 7	REV 01	740-047547		CXP-TXP-3D
Xcvr 8	REV 01	740-047547		CXP-TXP-3D
Xcvr 10	REV 01	740-047547		CXP-TXP-3D
Xcvr 12	REV 01	740-047547		CXP-TXP-3D
Xcvr 14	REV 01	740-047547		CXP-TXP-3D
Xcvr 0	REV 01	740-048813		
Xcvr 1	REV 01	740-048813		
Xcvr 2	REV 01	740-048813		
Xcvr 3	REV 01	740-048813		
Xcvr 4	REV 01	740-048813		
Xcvr 5	REV 01	740-047547		CXP-TXP-3D
Xcvr 6	REV 01	740-047547		CXP-TXP-3D
Xcvr 7	REV 01	740-047547		CXP-TXP-3D
Xcvr 8	REV 01	740-047547		CXP-TXP-3D
Xcvr 10	REV 01	740-047547		CXP-TXP-3D
Xcvr 12	REV 01	740-047547		CXP-TXP-3D
Xcvr 14	REV 01	740-047547		CXP-TXP-3D
SIB F13 9	REV 16	750-035002	PROTOXCLEI	SIB-TXP-3D-F13
Xcvr 0	REV 01	740-047547		CXP-TXP-3D
Xcvr 1	REV 01	740-047547		CXP-TXP-3D
Xcvr 2	REV 01	740-047547		CXP-TXP-3D
Xcvr 3	REV 01	740-047547		CXP-TXP-3D
Xcvr 4	REV 01	740-047547		CXP-TXP-3D
Xcvr 5	REV 01	740-047547		CXP-TXP-3D
Xcvr 6	REV 01	740-047547		CXP-TXP-3D

Xcvr 7	REV 01	740-047547		CXP-TXP-3D
Xcvr 8	REV 01	740-047547		CXP-TXP-3D
Xcvr 10	REV 01	740-047547		CXP-TXP-3D
Xcvr 12	REV 01	740-047547		CXP-TXP-3D
Xcvr 14	REV 01	740-047547		CXP-TXP-3D
SIB F13 11	REV 10	750-035002	PROTOXCLEI	750-035002
Xcvr 0	REV 01	740-048813		
Xcvr 1	REV 01	740-048813		
Xcvr 2	REV 01	740-048813		
Xcvr 3	REV 01	740-048813		
Xcvr 4	REV 01	740-048813		
Xcvr 5	REV 01	740-048813		
Xcvr 6	REV 01	740-047547		CXP-TXP-3D
Xcvr 7	REV 01	740-048813		
Xcvr 8	REV 01	740-047547		CXP-TXP-3D
Xcvr 12	REV 01	740-047547		CXP-TXP-3D
Xcvr 14	REV 01	740-047547		CXP-TXP-3D
SIB F13 12	REV 16	750-035002	PROTOXCLEI	SIB-TXP-3D-F13
Xcvr 0	REV 01	740-047547		CXP-TXP-3D
Xcvr 1	REV 01	740-047547		CXP-TXP-3D
Xcvr 2	REV 01	740-047547		CXP-TXP-3D
Xcvr 3	REV 01	740-047547		CXP-TXP-3D
Xcvr 4	REV 01	740-047547		CXP-TXP-3D
Xcvr 5	REV 01	740-047547		CXP-TXP-3D
Xcvr 6	REV 01	740-047547		CXP-TXP-3D
Xcvr 7	REV 01	740-047547		CXP-TXP-3D
Xcvr 8	REV 01	740-047547		CXP-TXP-3D
Xcvr 10	REV 01	740-047547		CXP-TXP-3D
Xcvr 12	REV 01	740-047547		CXP-TXP-3D
Xcvr 14	REV 01	740-047547		CXP-TXP-3D
SIB F2S 0/0	REV 06	750-034978	PROTOXCLEI	SIB-TXP-3D-F2S
SIB F2S 0/2	REV 07	750-034978	PROTOXCLEI	SIB-TXP-3D-F2S
SIB F2S 0/4	REV 06	750-034978	PROTOXCLEI	SIB-TXP-3D-F2S
SIB F2S 0/6	REV 06	750-034978	PROTOXCLEI	SIB-TXP-3D-F2S
SIB F2S 1/0	REV 07	750-034978	PROTOXCLEI	SIB-TXP-3D-F2S
SIB F2S 1/2	REV 07	750-034978	PROTOXCLEI	SIB-TXP-3D-F2S
SIB F2S 1/4	REV 07	750-034978	PROTOXCLEI	SIB-TXP-3D-F2S
SIB F2S 1/6	REV 08	750-034978	PROTOXCLEI	SIB-TXP-3D-F2S
SIB F2S 2/0	REV 06	750-034978	PROTOXCLEI	SIB-TXP-3D-F2S
SIB F2S 2/2	REV 06	750-034978	PROTOXCLEI	SIB-TXP-3D-F2S
SIB F2S 2/4	REV 07	750-034978	PROTOXCLEI	SIB-TXP-3D-F2S
SIB F2S 2/6	REV 06	750-034978	PROTOXCLEI	SIB-TXP-3D-F2S
SIB F2S 3/0	REV 07	750-034978	PROTOXCLEI	SIB-TXP-3D-F2S
SIB F2S 3/2	REV 06	750-034978	PROTOXCLEI	SIB-TXP-3D-F2S
SIB F2S 3/4	REV 06	750-034978	PROTOXCLEI	SIB-TXP-3D-F2S
SIB F2S 3/6	REV 06	750-034978	PROTOXCLEI	SIB-TXP-3D-F2S
SIB F2S 4/0	REV 07	750-034978	PROTOXCLEI	SIB-TXP-3D-F2S
SIB F2S 4/2	REV 06	750-034978	PROTOXCLEI	SIB-TXP-3D-F2S
SIB F2S 4/4	REV 06	750-034978	PROTOXCLEI	SIB-TXP-3D-F2S
SIB F2S 4/6	REV 06	750-034978	PROTOXCLEI	SIB-TXP-3D-F2S
Fan Tray 0	REV 10	760-024497		FANTRAY-TXP-H-S
Fan Tray 1	REV 10	760-024497		FANTRAY-TXP-H-S
Fan Tray 2	REV 10	760-024502		FANTRAY-TXP-V-S
Fan Tray 3	REV 10	760-024502		FANTRAY-TXP-V-S
Fan Tray 4	REV 10	760-024502		FANTRAY-TXP-V-S
Fan Tray 5	REV 10	760-024502		FANTRAY-TXP-V-S

1cc0-re0:

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Hardware inventory:

Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 01	710-027486	IPMJ700DRD	CHAS-BP-T1600-S
FPM Display	REV 04	710-021387		CRAFT-T1600-S
CIP	REV 06	710-002895		CIP-L-T640-S
PEM 0	REV 05	740-036442	IPUPAG6KAA	PWR-T-6-60-DC-S
PEM 1	REV 05	740-036442	IPUPAG6KAA	PWR-T-6-60-DC-S
SCG 0	REV 18	710-003423		SCG-T-S
SCG 1	REV 18	710-003423		SCG-T-S
Routing Engine 0	REV 10	740-026941		RE-DUO-C1800-8G-S
Routing Engine 1	REV 07	740-026941		RE-DUO-C1800-8G-S
CB 0	REV 11	710-022597		CB-LCC-S
CB 1	REV 11	710-022597		CB-LCC-S
FPC 0	REV 01	750-045173	IP9IAL4DAB	T4000-FPC5-3D
PIC 0	REV 17	750-034624	IP9IAL2DAA	PF-12XGE-SFPP
PIC 1	REV 17	750-034624	IP9IAL2DAA	PF-12XGE-SFPP
FPC 3	REV 01	750-045173	IP9IAL4DAB	T4000-FPC5-3D
PIC 0	REV 13	750-033423	XXXXXXXXDD	PF-12-24XGE-SFPP
FPC 4	REV 02	750-045173	IP9IAL4DAC	T4000-FPC5-3D
PIC 0	REV 17	750-034624	IP9IAL2DAA	PF-12XGE-SFPP
PIC 1	REV 17	750-034624	IP9IAL2DAA	PF-12XGE-SFPP
FPC 5	REV 01	750-045173	IP9IAL4DAB	T4000-FPC5-3D
PIC 0	REV 17	750-034624	IP9IAL2DAA	PF-12XGE-SFPP
PIC 1	REV 17	750-034624	IP9IAL2DAA	PF-12XGE-SFPP
FPC 6	REV 01	750-045173	IP9IAL4DAB	T4000-FPC5-3D
PIC 0	REV 17	750-034624	IP9IAL2DAA	PF-12XGE-SFPP
PIC 1	REV 10	750-035293	IP9IAL3DAA	PF-1CGE-CFP
SIB 0	REV 06	750-041657	PROTOXCLEI	SIB-TXP-3D-LCC
Xcvr 0	REV 01	740-048813		
Xcvr 1	REV 01	740-048813		
Xcvr 2	REV 01	740-048813		
Xcvr 3	REV 01	740-048813		
Xcvr 4	REV 01	740-048813		
Xcvr 5	REV 01	740-048813		
Xcvr 6	REV 01	740-048813		
Xcvr 7	REV 01	740-048813		
SIB 1	REV 06	750-041657	PROTOXCLEI	SIB-TXP-3D-LCC
Xcvr 0	REV 01	740-048813		
Xcvr 1	REV 01	740-048813		
Xcvr 2	REV 01	740-048813		
Xcvr 3	REV 01	740-048813		
Xcvr 4	REV 01	740-048813		
Xcvr 5	REV 01	740-048813		
Xcvr 6	REV 01	740-048813		
Xcvr 7	REV 01	740-048813		
SIB 2	REV 06	750-041657	PROTOXCLEI	SIB-TXP-3D-LCC
Xcvr 0	REV 01	740-048813		
Xcvr 1	REV 01	740-048813		
Xcvr 2	REV 01	740-048813		
Xcvr 3	REV 01	740-048813		
Xcvr 4	REV 01	740-048813		
Xcvr 5	REV 01	740-048813		
Xcvr 6	REV 01	740-048813		
Xcvr 7	REV 01	740-048813		
SIB 3	REV 07	750-041657	PROTOXCLEI	SIB-TXP-3D-LCC
Xcvr 0	REV 01	740-048813		
Xcvr 1	REV 01	740-048813		
Xcvr 2	REV 01	740-048813		
Xcvr 3	REV 01	740-048813		
Xcvr 4	REV 01	740-048813		
Xcvr 5	REV 01	740-048813		

Xcvr 6	REV 01	740-048813	PROTOXCLEI	SIB-TXP-3D-LCC
Xcvr 7	REV 01	740-048813		
SIB 4	REV 06	750-041657		
Xcvr 0	REV 01	740-048813		
Xcvr 1	REV 01	740-048813		
Xcvr 2	REV 01	740-048813		
Xcvr 3	REV 01	740-048813		
Xcvr 4	REV 01	740-048813		
Xcvr 5	REV 01	740-048813		
Xcvr 6	REV 01	740-048813		
Xcvr 7	REV 01	740-048813		
Fan Tray 0				FANTRAY-T-S
Fan Tray 1				FANTRAY-T-S
Fan Tray 2				FANTRAY-TXP3D-LCC-R-S
[Output Truncated]				

### show chassis hardware detail (TX Matrix Plus Router with 3D SIBs)

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user@host> show chassis hardware detail
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sfc0-re0:
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Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN11CAAA4AHB	TXP
Midplane	REV 05	710-022574	ABAC4696	SFC Midplane
FPM Display	REV 09	710-024027	EH3138	TXP FPM Display
CIP 0	REV 12	710-023792	EF6349	TXP CIP
CIP 1	REV 12	710-023792	EG5294	TXP CIP
PEM 0	Rev 06	740-027463	XH04595	Power Entry Module
PEM 1	Rev 06	740-027463	XH04592	Power Entry Module
Routing Engine 0	REV 07	740-026942	P737A-002541	RE-DUO-2600
ad0	3823 MB	SMART CF	2011030400062C132C13	Compact Flash
ad1	62720 MB	SMART Lite SATA Drive	201105100009A452A452	Disk 1
Routing Engine 1	REV 07	740-026942	P737A-002602	RE-DUO-2600
ad0	3823 MB	SMART CF	20110508085EE471E471	Compact Flash
ad1	62720 MB	SMART Lite SATA Drive	201110210089DF39DF39	Disk 1
CB 0	REV 15	710-022606	EH4376	SFC Control Board
CB 1	REV 15	710-022606	EH4379	SFC Control Board
SPMB 0		BUILTIN		SFC Switch CPU
SPMB 1		BUILTIN		SFC Switch CPU
SIB F13 0	REV 10	750-035002	EM9305	F13 SIB 3D
B Board	REV 06	711-035082	EM9667	F13 SIB 3D Mezz
P Board	REV 05	711-043544	EM9708	F13 SIB 3D Power
Xcvr 0	REV 01	740-047547	XB34FB00S	CXP Module
Xcvr 2	REV 01	740-047547	XB48FB01H	CXP Module
Xcvr 4	REV 01	740-047547	XB34FB02W	CXP Module
Xcvr 6	REV 01	740-047547	XB34FB01T	CXP Module
Xcvr 8	REV 01	740-047547	XB48FB00W	CXP Module
Xcvr 10	REV 01	740-047547	XB34FB01S	CXP Module
Xcvr 12	REV 01	740-047547	XB34FB03H	CXP Module
Xcvr 14	REV 01	740-047547	XB34FB023	CXP Module
SIB F13 3	REV 01	710-035001	EJ2612	F13 SIB 3D
B Board	REV 01	711-035082	EJ3815	F13 SIB 3D Mezz
P Board	REV 01	711-043544	EJ2678	F13 SIB 3D Power
Xcvr 0	REV 01	740-047547	XB48FB04C	CXP Module
Xcvr 2	REV 01	740-047547	XB48FB00Z	CXP Module
Xcvr 4	REV 01	740-047547	XB47FB036	CXP Module
Xcvr 6	REV 01	740-047547	XB47FB029	CXP Module
Xcvr 8	REV 01	740-047547	XB48FB02N	CXP Module

Xcvr 10	REV 01	740-047547	XB42FB0CS	CXP Module
Xcvr 12	REV 01	740-047547	XB47FB01X	CXP Module
Xcvr 14	REV 01	740-047547	XB48FB02F	CXP Module
SIB F13 6	REV 05	750-035002	EK2675	F13 SIB 3D
B Board	REV 03	711-035082	EK2612	F13 SIB 3D Mezz
P Board	REV 04	711-043544	EK1179	F13 SIB 3D Power
Xcvr 0	REV 01	740-047547	XB48FB01T	CXP Module
Xcvr 2	REV 01	740-047547	XB48FB02M	CXP Module
Xcvr 4	REV 01	740-047547	XB48FB031	CXP Module
Xcvr 6	REV 01	740-047547	XB48FB04P	CXP Module
Xcvr 8	REV 01	740-047547	XB48FB02T	CXP Module
Xcvr 10	REV 01	740-047547	XB34FB01V	CXP Module
Xcvr 12	REV 01	740-047547	XB48FB02C	CXP Module
Xcvr 14		NON-JNPR		No Module
SIB F13 12	REV 01	710-035001	EJ2631	F13 SIB 3D
B Board	REV 01	711-035082	EJ3808	F13 SIB 3D Mezz
P Board	REV 01	711-043544	EJ2676	F13 SIB 3D Power
SIB F2S 0/0	REV 01	711-034977	EH9829	F2S SIB 3D
B Board	REV 01	711-034979	EH9927	F2S SIB 3D Mezz
SIB F2S 0/2	REV 01	711-034977	EH9791	F2S SIB 3D
B Board	REV 01	711-034979	EH9852	F2S SIB 3D Mezz
SIB F2S 0/4	REV 01	711-034977	EH9803	F2S SIB 3D
B Board	REV 01	711-034979	EH9915	F2S SIB 3D Mezz
SIB F2S 0/6	REV 01	711-034977	EH9763	F2S SIB 3D
B Board	REV 01	711-034979	EH9880	F2S SIB 3D Mezz
SIB F2S 1/0	REV 01	711-034977	EH9757	F2S SIB 3D
B Board	REV 01	711-034979	EH9889	F2S SIB 3D Mezz
SIB F2S 1/2	REV 01	711-034977	EH9815	F2S SIB 3D
B Board	REV 01	711-034979	EH9890	F2S SIB 3D Mezz
SIB F2S 1/4	REV 08	750-034978	EN1954	F2S SIB 3D
B Board	REV 02	711-034979	EN1436	F2S SIB 3D Mezz
SIB F2S 1/6	REV 01	711-034977	EJ7054	F2S SIB 3D
B Board	REV 01	711-034979	EJ8238	F2S SIB 3D Mezz
SIB F2S 2/0	REV 01	711-034977	EH9830	F2S SIB 3D
B Board	REV 01	711-034979	EH9844	F2S SIB 3D Mezz
SIB F2S 2/2	REV 01	711-034977	EH9818	F2S SIB 3D
B Board	REV 01	711-034979	EH9888	F2S SIB 3D Mezz
SIB F2S 2/4	REV 01	711-034977	EH9795	F2S SIB 3D
B Board	REV 01	711-034979	EH9869	F2S SIB 3D Mezz
SIB F2S 2/6	REV 01	711-034977	EJ7026	F2S SIB 3D
B Board	REV 01	711-034979	EJ8273	F2S SIB 3D Mezz
SIB F2S 3/0	REV 01	711-034977	EH9811	F2S SIB 3D
B Board	REV 01	711-034979	EH9892	F2S SIB 3D Mezz
SIB F2S 3/2	REV 01	711-034977	EH9812	F2S SIB 3D
B Board	REV 01	711-034979	EH9877	F2S SIB 3D Mezz
SIB F2S 3/4	REV 08	750-034978	EN1947	F2S SIB 3D
B Board	REV 02	711-034979	EN1471	F2S SIB 3D Mezz
Fan Tray 0	REV 10	760-024497	EH3313	Front Fan Tray
Fan Tray 1	REV 10	760-024497	EH3290	Front Fan Tray
Fan Tray 2	REV 10	760-024502	EH3292	Rear Fan Tray
Fan Tray 3	REV 10	760-024502	EH3287	Rear Fan Tray
Fan Tray 4	REV 10	760-024502	EH3286	Rear Fan Tray
Fan Tray 5	REV 10	760-024502	EH3285	Rear Fan Tray

1cc0-re0:

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Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN11B23FEAHA	T1600
Midplane	REV 01	710-027486	RC9787	T-series Backplane

FPM GBUS	REV 13	710-002901	BBAG5132	T640 FPM Board
FPM Display	REV 04	710-021387	BBAL9612	T1600 FPM Display
CIP	REV 06	710-002895	BBAN0605	T-series CIP
PEM 0	REV 05	740-036442	1G022060143	Power Entry Module 6x60
PEM 1	REV 05	740-036442	1G022060011	Power Entry Module 6x60
SCG 0	REV 18	710-003423	BBAL7318	T640 Sonet Clock Gen.
SCG 1	REV 18	710-003423	BBAL7255	T640 Sonet Clock Gen.
Routing Engine 0	REV 07	740-026941	P737F-002933	RE-DUO-1800
ad0	3823 MB	SMART CF	201103030490604E604E	Compact Flash
ad1	62720 MB	SMART Lite SATA Drive	20110729028B11D411D4	Disk 1
Routing Engine 1	REV 06	740-026941	P737F-002749	RE-DUO-1800
ad0	3823 MB	SMART CF	2011010504EB99649964	Compact Flash
ad1	62720 MB	SMART Lite SATA Drive	201102140058934A934A	Disk 1
CB 0	REV 11	710-022597	EH3611	LCC Control Board
CB 1	REV 11	710-022597	EH4798	LCC Control Board
FPC 5	REV 17	710-013037	BBAC5333	FPC Type 4-ES
CPU	REV 10	710-016744	BBAB7619	ST-PMB2
PIC 0	REV 18	750-017405	BBAE3420	4x 10GE (LAN/WAN) XFP
Xcvr 0	REV 03	740-014289	T10C90659	XFP-10G-SR
MMB 0	REV 05	710-025563	BBAB9538	ST-MMB2
MMB 1	REV 05	710-025563	BBAB9502	ST-MMB2
FPC 7	REV 01	750-045173	BBAV0032	FPC Type 5-3D
CPU				
SPMB 0	REV 05	710-023321	EG9434	LCC Switch CPU
SPMB 1	REV 05	710-023321	EH3878	LCC Switch CPU
SIB 0	REV 01	750-041657	EH7997	LCC SIB 3D
B Board	REV 01	711-042424	EH7674	LCC SIB 3D Mezz
Xcvr 0	REV 01	740-047547	XB48FB014	CXP Module
Xcvr 2	REV 01	740-047547	XB48FB05A	CXP Module
Xcvr 4	REV 01	740-047547	XB48FB052	CXP Module
Xcvr 6	REV 01	740-047547	XB48FB01B	CXP Module
SIB 1	REV 01	750-041657	EH8023	LCC SIB 3D
B Board	REV 01	711-042424	EH7659	LCC SIB 3D Mezz
Xcvr 0	REV 01	740-047547	XB48FB05J	CXP Module
Xcvr 2	REV 01	740-047547	XB48FB01E	CXP Module
Xcvr 4	REV 01	740-047547	XB48FB01J	CXP Module
Xcvr 6	REV 01	740-047547	XB48FB02S	CXP Module
SIB 2	REV 03	750-041657	EJ6554	LCC SIB 3D
B Board	REV 02	711-042424	EJ5756	LCC SIB 3D Mezz
Xcvr 0	REV 01	740-047547	XB34FB01Z	CXP Module
Xcvr 2	REV 01	740-047547	XB34FB013	CXP Module
Xcvr 4	REV 01	740-047547	XB48FB04Z	CXP Module
Xcvr 6	REV 01	740-047547	XB48FB05N	CXP Module
Fan Tray 0				Front Top Fan Tray
Fan Tray 1				Front Bottom Fan Tray
Fan Tray 2				Rear Fan Tray -- Rev 4

lcc2-re0:

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Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN11B3975AHA	T1600
Midplane	REV 01	710-027486	RC9826	T-series Backplane
FPM GBUS	REV 13	710-002901	BBAG5124	T640 FPM Board
FPM Display	REV 03	710-021387	BBAJ1112	T1600 FPM Display
CIP	REV 06	710-002895	BBAL3744	T-series CIP
PEM 0	REV 05	740-036442	1G022060081	Power Entry Module 6x60
PEM 1	REV 05	740-036442	1G022060188	Power Entry Module 6x60
SCG 0	REV 18	710-003423	BBAH8775	T640 Sonet Clock Gen.
SCG 1	REV 18	710-003423	BBAL7272	T640 Sonet Clock Gen.

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Routing Engine 0 REV 07 740-026941 P737F-002992 RE-DUO-1800
  ad0 3823 MB SMART CF 201103030356329E329E Compact Flash
  ad1 62720 MB SMART Lite SATA Drive 2011051000488D8B8D8B Disk 1
Routing Engine 1 REV 07 740-026941 P737F-002938 RE-DUO-1800
  ad0 3823 MB SMART CF 20110304000F02680268 Compact Flash
  ad1 62720 MB SMART Lite SATA Drive 201105300A70F325F325 Disk 1
CB 0 REV 11 710-022597 EH4805 LCC Control Board
CB 1 REV 11 710-022597 EH4786 LCC Control Board
FPC 1 REV 01 710-033873 BBAH0320 FPC Type 3-ES
  CPU REV 11 710-016744 BBAF3281 ST-PMB2
  MMB 0 REV 06 710-025563 BBAF5061 ST-MMB2
FPC 5 REV 04 710-033871 BBAM5070 FPC Type 4-ES
  CPU REV 11 710-016744 BBAM6653 ST-PMB2
  PIC 1 REV 20 750-017405 BBAM1296 4x 10GE (LAN/WAN) XFP
    Xcvr 0 REV 03 740-014289 T10B42981 XFP-10G-SR
  MMB 0 REV 07 710-025563 BBAN2631 ST-MMB2
  MMB 1 REV 07 710-025563 BBAN2538 ST-MMB2
SPMB 0 REV 05 710-023321 EH3903 LCC Switch CPU
SPMB 1 REV 05 710-023321 EH3902 LCC Switch CPU
SIB 0 REV 01 750-041657 EH8019 LCC SIB 3D
  B Board REV 01 711-042424 EH7680 LCC SIB 3D Mezz
    Xcvr 0 REV 01 740-047547 XB48FB04F CXP Module
    Xcvr 2 REV 01 740-047547 XB48FB04S CXP Module
    Xcvr 4 REV 01 740-047547 XB48FB04B CXP Module
    Xcvr 6 REV 01 740-047547 XB48FB043 CXP Module
  SIB 1 REV 01 750-041657 EH8012 LCC SIB 3D
    B Board REV 01 711-042424 EH7658 LCC SIB 3D Mezz
      Xcvr 0 REV 01 740-047547 XB48FB05E CXP Module
      Xcvr 2 REV 01 740-047547 XB48FB01Z CXP Module
      Xcvr 4 REV 01 740-047547 XB48FB018 CXP Module
      Xcvr 6 REV 01 740-047547 XB48FB054 CXP Module
  SIB 2 REV 01 750-041657 EH7993 LCC SIB 3D
    B Board REV 01 711-042424 EH7678 LCC SIB 3D Mezz
      Xcvr 0 REV 01 740-047547 XB48FB05C CXP Module
      Xcvr 2 REV 01 740-047547 XB47FB00N CXP Module
      Xcvr 4 REV 01 740-047547 XB48FB05U CXP Module
      Xcvr 6 REV 01 740-047547 XB48FB05L CXP Module
Fan Tray 0 Front Top Fan Tray
Fan Tray 1 Front Bottom Fan Tray
Fan Tray 2 Rear Fan Tray -- Rev 4

```

### show chassis hardware lcc (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis hardware lcc 0
```

```
lcc0-re0:
```

```
-----
Hardware inventory:
```

Item	Version	Part number	Serial number	Description
Chassis			JN11B23FEAHA	T1600
Midplane	REV 01	710-027486	RC9787	T-series Backplane
FPM GBUS	REV 13	710-002901	BBAG5132	T640 FPM Board
FPM Display	REV 04	710-021387	BBAL9612	T1600 FPM Display
CIP	REV 06	710-002895	BBAN0605	T-series CIP
PEM 0	REV 05	740-036442	1G022060143	Power Entry Module 6x60
PEM 1	REV 05	740-036442	1G022060011	Power Entry Module 6x60
SCG 0	REV 18	710-003423	BBAL7318	T640 Sonet Clock Gen.
SCG 1	REV 18	710-003423	BBAL7255	T640 Sonet Clock Gen.
Routing Engine 0	REV 07	740-026941	P737F-002933	RE-DUO-1800
Routing Engine 1	REV 06	740-026941	P737F-002749	RE-DUO-1800

CB 0	REV 11	710-022597	EH3611	LCC Control Board
CB 1	REV 11	710-022597	EH4798	LCC Control Board
FPC 5	REV 17	710-013037	BBAC5333	FPC Type 4-ES
CPU	REV 10	710-016744	BBAB7619	ST-PMB2
PIC 0	REV 18	750-017405	BBAE3420	4x 10GE (LAN/WAN) XFP
Xcvr 0	REV 03	740-014289	T10C90659	XFP-10G-SR
MMB 0	REV 05	710-025563	BBAB9538	ST-MMB2
MMB 1	REV 05	710-025563	BBAB9502	ST-MMB2
FPC 7	REV 01	750-045173	BBAV0032	FPC Type 5-3D
CPU				
SPMB 0	REV 05	710-023321	EG9434	LCC Switch CPU
SPMB 1	REV 05	710-023321	EH3878	LCC Switch CPU
SIB 0	REV 01	750-041657	EH7997	LCC SIB 3D
B Board	REV 01	711-042424	EH7674	LCC SIB 3D Mezz
Xcvr 0	REV 01	740-047547	XB48FB014	CXP Module
Xcvr 2	REV 01	740-047547	XB48FB05A	CXP Module
Xcvr 4	REV 01	740-047547	XB48FB052	CXP Module
Xcvr 6	REV 01	740-047547	XB48FB01B	CXP Module
SIB 1	REV 01	750-041657	EH8023	LCC SIB 3D
B Board	REV 01	711-042424	EH7659	LCC SIB 3D Mezz
Xcvr 0	REV 01	740-047547	XB48FB05J	CXP Module
Xcvr 2	REV 01	740-047547	XB48FB01E	CXP Module
Xcvr 4	REV 01	740-047547	XB48FB01J	CXP Module
Xcvr 6	REV 01	740-047547	XB48FB02S	CXP Module
SIB 2	REV 03	750-041657	EJ6554	LCC SIB 3D
B Board	REV 02	711-042424	EJ5756	LCC SIB 3D Mezz
Xcvr 0	REV 01	740-047547	XB34FB01Z	CXP Module
Xcvr 2	REV 01	740-047547	XB34FB013	CXP Module
Xcvr 4	REV 01	740-047547	XB48FB04Z	CXP Module
Xcvr 6	REV 01	740-047547	XB48FB05N	CXP Module
Fan Tray 0				Front Top Fan Tray
Fan Tray 1				Front Bottom Fan Tray
Fan Tray 2				Rear Fan Tray -- Rev 4

### show chassis hardware sfc (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis hardware sfc 0
```

```
sfc0-re0:
```

```
-----
```

```
Hardware inventory:
```

Item	Version	Part number	Serial number	Description
Chassis			JN11CAAA4AHB	TXP
Midplane	REV 05	710-022574	ABAC4696	SFC Midplane
FPM Display	REV 09	710-024027	EH3138	TXP FPM Display
CIP 0	REV 12	710-023792	EF6349	TXP CIP
CIP 1	REV 12	710-023792	EG5294	TXP CIP
PEM 0	Rev 06	740-027463	XH04595	Power Entry Module
PEM 1	Rev 06	740-027463	XH04592	Power Entry Module
Routing Engine 0	REV 07	740-026942	P737A-002541	RE-DUO-2600
Routing Engine 1	REV 07	740-026942	P737A-002602	RE-DUO-2600
CB 0	REV 15	710-022606	EH4376	SFC Control Board
CB 1	REV 15	710-022606	EH4379	SFC Control Board
SPMB 0		BUILTIN		SFC Switch CPU
SPMB 1		BUILTIN		SFC Switch CPU
SIB F13 0	REV 10	750-035002	EM9305	F13 SIB 3D
B Board	REV 06	711-035082	EM9667	F13 SIB 3D Mezz
P Board	REV 05	711-043544	EM9708	F13 SIB 3D Power
Xcvr 0	REV 01	740-047547	XB34FB00S	CXP Module
Xcvr 2	REV 01	740-047547	XB48FB01H	CXP Module



Xcvr 4	REV 01	740-047547	XB34FB02W	CXP Module
Xcvr 6	REV 01	740-047547	XB34FB01T	CXP Module
Xcvr 8	REV 01	740-047547	XB48FB00W	CXP Module
Xcvr 10	REV 01	740-047547	XB34FB01S	CXP Module
Xcvr 12	REV 01	740-047547	XB34FB03H	CXP Module
Xcvr 14	REV 01	740-047547	XB34FB023	CXP Module
SIB F13 3	REV 01	710-035001	EJ2612	F13 SIB 3D
B Board	REV 01	711-035082	EJ3815	F13 SIB 3D Mezz
P Board	REV 01	711-043544	EJ2678	F13 SIB 3D Power
Xcvr 0	REV 01	740-047547	XB48FB04C	CXP Module
Xcvr 2	REV 01	740-047547	XB48FB00Z	CXP Module
Xcvr 4	REV 01	740-047547	XB47FB036	CXP Module
Xcvr 6	REV 01	740-047547	XB47FB029	CXP Module
Xcvr 8	REV 01	740-047547	XB48FB02N	CXP Module
Xcvr 10	REV 01	740-047547	XB42FB0CS	CXP Module
Xcvr 12	REV 01	740-047547	XB47FB01X	CXP Module
Xcvr 14	REV 01	740-047547	XB48FB02F	CXP Module
SIB F13 6	REV 05	750-035002	EK2675	F13 SIB 3D
B Board	REV 03	711-035082	EK2612	F13 SIB 3D Mezz
P Board	REV 04	711-043544	EK1179	F13 SIB 3D Power
Xcvr 0	REV 01	740-047547	XB48FB01T	CXP Module
Xcvr 2	REV 01	740-047547	XB48FB02M	CXP Module
Xcvr 4	REV 01	740-047547	XB48FB031	CXP Module
Xcvr 6	REV 01	740-047547	XB48FB04P	CXP Module
Xcvr 8	REV 01	740-047547	XB48FB02T	CXP Module
Xcvr 10	REV 01	740-047547	XB34FB01V	CXP Module
Xcvr 12	REV 01	740-047547	XB48FB02C	CXP Module
Xcvr 14		NON-JNPR		No Module
SIB F13 12	REV 01	710-035001	EJ2631	F13 SIB 3D
B Board	REV 01	711-035082	EJ3808	F13 SIB 3D Mezz
P Board	REV 01	711-043544	EJ2676	F13 SIB 3D Power
SIB F2S 0/0	REV 01	711-034977	EH9829	F2S SIB 3D
B Board	REV 01	711-034979	EH9927	F2S SIB 3D Mezz
SIB F2S 0/2	REV 01	711-034977	EH9791	F2S SIB 3D
B Board	REV 01	711-034979	EH9852	F2S SIB 3D Mezz
SIB F2S 0/4	REV 01	711-034977	EH9803	F2S SIB 3D
B Board	REV 01	711-034979	EH9915	F2S SIB 3D Mezz
SIB F2S 0/6	REV 01	711-034977	EH9763	F2S SIB 3D
B Board	REV 01	711-034979	EH9880	F2S SIB 3D Mezz
SIB F2S 1/0	REV 01	711-034977	EH9757	F2S SIB 3D
B Board	REV 01	711-034979	EH9889	F2S SIB 3D Mezz
SIB F2S 1/2	REV 01	711-034977	EH9815	F2S SIB 3D
B Board	REV 01	711-034979	EH9890	F2S SIB 3D Mezz
SIB F2S 1/4	REV 08	750-034978	EN1954	F2S SIB 3D
B Board	REV 02	711-034979	EN1436	F2S SIB 3D Mezz
SIB F2S 1/6	REV 01	711-034977	EJ7054	F2S SIB 3D
B Board	REV 01	711-034979	EJ8238	F2S SIB 3D Mezz
SIB F2S 2/0	REV 01	711-034977	EH9830	F2S SIB 3D
B Board	REV 01	711-034979	EH9844	F2S SIB 3D Mezz
SIB F2S 2/2	REV 01	711-034977	EH9818	F2S SIB 3D
B Board	REV 01	711-034979	EH9888	F2S SIB 3D Mezz
SIB F2S 2/4	REV 01	711-034977	EH9795	F2S SIB 3D
B Board	REV 01	711-034979	EH9869	F2S SIB 3D Mezz
SIB F2S 2/6	REV 01	711-034977	EJ7026	F2S SIB 3D
B Board	REV 01	711-034979	EJ8273	F2S SIB 3D Mezz
SIB F2S 3/0	REV 01	711-034977	EH9811	F2S SIB 3D
B Board	REV 01	711-034979	EH9892	F2S SIB 3D Mezz
SIB F2S 3/2	REV 01	711-034977	EH9812	F2S SIB 3D
B Board	REV 01	711-034979	EH9877	F2S SIB 3D Mezz
SIB F2S 3/4	REV 08	750-034978	EN1947	F2S SIB 3D

B Board	REV 02	711-034979	EN1471	F2S SIB 3D Mezz
Fan Tray 0	REV 10	760-024497	EH3313	Front Fan Tray
Fan Tray 1	REV 10	760-024497	EH3290	Front Fan Tray
Fan Tray 2	REV 10	760-024502	EH3292	Rear Fan Tray
Fan Tray 3	REV 10	760-024502	EH3287	Rear Fan Tray
Fan Tray 4	REV 10	760-024502	EH3286	Rear Fan Tray
Fan Tray 5	REV 10	760-024502	EH3285	Rear Fan Tray

### show chassis hardware (16-Port 10-Gigabit Ethernet MPC with SFP+ Optics [MX Series Routers])

```
user@host> show chassis hardware
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN112D865AFA	MX960
Midplane	REV 03	710-013698	TS3339	MX960 Backplane
FPM Board	REV 03	710-014974	WW6267	Front Panel Display
PDM	Rev 03	740-013110	QCS12485026	Power Distribution
Module				
PEM 0	Rev 04	740-013682	QCS12434086	PS 1.7kW; 200-240VAC
in				
PEM 1	Rev 04	740-013682	QCS1243408Z	PS 1.7kW; 200-240VAC
in				
PEM 2	Rev 04	740-013682	QCS1243407X	PS 1.7kW; 200-240VAC
in				
Routing Engine 0	REV 07	740-015113	9009009677	RE-S-1300
Routing Engine 1	REV 07	740-015113	9009011510	RE-S-1300
CB 0	REV 03	710-021523	XF0394	MX SCB
CB 1	REV 03	710-021523	XF0550	MX SCB
CB 2	REV 03	710-021523	XD7455	MX SCB
FPC 4	REV 02	750-028467	JR6127	MPC M 16x 10GE
CPU	REV 02	711-029089	JX0129	AS PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
PIC 1		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
PIC 2		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
PIC 3		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Fan Tray 0	REV 05	740-014971	TP9990	Fan Tray
Fan Tray 1	REV 05	740-014971	VS1709	Fan Tray

### show chassis hardware (MPC3E [MX Series Routers])

```
user@host> show chassis hardware
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN1101AFEAFB	MX480
Midplane	REV 05	710-017414	TR4444	MX480 Midplane
FPM Board	REV 02	710-017254	KG6056	Front Panel Display
PEM 0	Rev 03	740-017330	QCS082090FC	PS 1.2-1.7kW; 100-240V
PEM 1	Rev 03	740-017330	QCS082090FD	PS 1.2-1.7kW; 100-240V
Routing Engine 0	REV 07	740-013063	9009004124	RE-S-2000
Routing Engine 1	REV 07	740-013063	9009005569	RE-S-2000
CB 0	REV 07	710-021523	XZ3587	MX SCB
CB 1	REV 03	710-021523	KH8306	MX SCB
FPC 1	REV 04.1.07	750-033205	P1240	MPC Type 3

CPU	REV 01	711-035209	YL0504	HMPC PMB 2G
MIC 1	REV 10	750-033199	YX4495	1X100GE CFP
PIC 2		BUILTIN	BUILTIN	1X100GE CFP
Xcvr 0	REV 01	740-032210	C22CQNE	CFP-100G-LR4
FPC 2	REV 26	750-016670	KH0045	DPCE 40x 1GE R EQ
CPU	REV 07	710-013713	KF5448	DPC PMB
PIC 0		BUILTIN	BUILTIN	10x 1GE(LAN) EQ
Xcvr 0	REV 01	740-011613	PF21JHU	SFP-SX
PIC 1		BUILTIN	BUILTIN	10x 1GE(LAN) EQ
Xcvr 9	REV 01	740-011613	AM0813S8ZL6	SFP-SX
PIC 2		BUILTIN	BUILTIN	10x 1GE(LAN) EQ
Xcvr 0	REV 02	740-011613	PGL2KYF	SFP-SX
Xcvr 2	REV 01	740-011613	AM0806S8N4P	SFP-SX
PIC 3		BUILTIN	BUILTIN	10x 1GE(LAN) EQ
Xcvr 5	REV 01	740-011613	AM0815S967N	SFP-SX
Xcvr 7	REV 01	740-011613	AM0806S8N1X	SFP-SX
Xcvr 8	REV 01	740-011613	AM0815S967J	SFP-SX
Xcvr 9	REV 01	740-011613	AM0815S967M	SFP-SX
FPC 3	REV 12.2.09	750-033205	YR9443	MPC Type 3
CPU	REV 03	711-035209	YL6931	HMPC PMB 2G
MIC 0	REV 05	750-033199	YR3269	1X100GE CFP
PIC 0		BUILTIN	BUILTIN	1X100GE CFP
Xcvr 0	REV 01	740-032210	ULH0KG3	CFP-100G-LR4
MIC 1	REV 02	750-033199	YG3245	1X100GE CFP
PIC 2		BUILTIN	BUILTIN	1X100GE CFP
Xcvr 0	REV 01	740-032210	ULH0KGF	CFP-100G-LR4
FPC 4	REV 12.3.09	750-033205	YR9437	MPC Type 3
CPU	REV 03	711-035209	YT5857	HMPC PMB 2G
MIC 0	REV 05	750-033199	YR3295	1X100GE CFP
PIC 0		BUILTIN	BUILTIN	1X100GE CFP
Xcvr 0		NON-JNPR	X12000187	CFP-100G-SR10
MIC 1	REV 10	750-033199	YX4518	1X100GE CFP
PIC 2		BUILTIN	BUILTIN	1X100GE CFP
Xcvr 0	REV 01	740-035329	X123000008	CFP-100G-SR10
FPC 5	REV 06	750-024884	JW9769	MPC Type 2 3D EQ
CPU	REV 02	711-028401	JR6158	MPC PMB 2G Proto
MIC 0	REV 05	750-028387	JR6197	3D 4x 10GE XFP
PIC 0		BUILTIN	BUILTIN	2x 10GE XFP
Xcvr 0	REV 01	740-014289	T07M71112	XFP-10G-SR
Xcvr 1	REV 02	740-014289	T08L85610	XFP-10G-SR
PIC 1		BUILTIN	BUILTIN	2x 10GE XFP
MIC 1	REV 22	750-028392	YM0053	3D 20x 1GE(LAN) SFP
PIC 2		BUILTIN	BUILTIN	10x 1GE(LAN) SFP
Xcvr 0	REV 01	740-011613	AM0703S005B	SFP-SX
Xcvr 1	REV 01	740-011613	E07L01352	SFP-SX
PIC 3		BUILTIN	BUILTIN	10x 1GE(LAN) SFP
Xcvr 5	REV 01	740-013111	6500217	SFP-T
Xcvr 9	REV 02	740-013111	8499527	SFP-T
Fan Tray				Left Fan Tray

The PIC number for MIC 1 always starts from 2 (even if the first MIC is a 1X100GE CFP or a legacy MIC).

### show chassis hardware (QFX3500 Switches)

```
user@switch> show chassis hardware
```

Hardware inventory:				
Item	Version	Part number	Serial number	Description
Chassis				QFX3500
Routing Engine 0		BUILTIN	BUILTIN	QFX Routing Engine
FPC 0	REV 04	750-044071	BBAR3902	QFX3500-48S4Q-AFI
CPU		BUILTIN	BUILTIN	FPC CPU
PIC 0		BUILTIN	BUILTIN	48x 10G-SFP+
PIC 1		BUILTIN	BUILTIN	15x 10G-SFP+
MGMT BRD	REV 02	750-044063	BBAR0398	QFX3500-MGMT-SFP-AFO
Xcvr 0	REV 01	740-011614	AC0946S0BD1	SFP-LX10
Xcvr 1	REV 02	740-013111	A281922	SFP-T
Power Supply 0	Rev 04	740-032091	UI00677	JPSU-650W-AC-AFI
Power Supply 1	REV 00	740-041741	VJ00162	JPSU-650W-AC-AFO
Fan Tray 0				QFX Fan Tray, Back to
Front Airlfow				
Fan Tray 1				QFX Fan Tray, Back to
Front Airlfow				
Fan Tray 2				QFX Fan Tray, Back to
Front Airlfow				

### show chassis hardware detail (QFX3500 Switches)

user@switch> show chassis hardware detail

Hardware inventory:				
Item	Version	Part number	Serial number	Description
Chassis			JN000TEST5	QFX3500
Routing Engine 0		BUILTIN	BUILTIN	QFX Routing Engine
FPC 0	REV 05	750-036931	EE0823	QFX3500-48S4Q-AFI
CPU		BUILTIN	BUILTIN	FPC CPU
PIC 0		BUILTIN	BUILTIN	48x 10G-SFP+
Xcvr 0	REV 01	740-030589	S99E270079	SFP+-10G-LPBK
Xcvr 1	REV 01	740-030589	S9AK450099	SFP+-10G-LPBK
Xcvr 2	REV 01	740-030589	S99E270078	SFP+-10G-LPBK
Xcvr 3	REV 01	740-030589	S9AK450098	SFP+-10G-LPBK
Xcvr 4	REV 01	740-030589	S99E270075	SFP+-10G-LPBK
Xcvr 5	REV 01	740-030589	S9AK450093	SFP+-10G-LPBK
Xcvr 6	REV 01	740-030589	S9AK450097	SFP+-10G-LPBK
Xcvr 7	REV 01	740-030589	S9AK450095	SFP+-10G-LPBK
Xcvr 8	REV 01	740-030589	S99E270072	SFP+-10G-LPBK
Xcvr 9	REV 01	740-030589	S99E270073	SFP+-10G-LPBK
Xcvr 10	REV 01	740-030589	S99E270080	SFP+-10G-LPBK
Xcvr 11	REV 01	740-030589	S9AK450169	SFP+-10G-LPBK
Xcvr 12	REV 01	740-030589	S99E270076	SFP+-10G-LPBK
Xcvr 13	REV 01	740-030589	S9AK450167	SFP+-10G-LPBK
Xcvr 14	REV 01	740-030589	S9AK450170	SFP+-10G-LPBK
Xcvr 15	REV 01	740-030589	S9AK450166	SFP+-10G-LPBK
Xcvr 16	REV 01	740-030589	S9AK450092	SFP+-10G-LPBK
Xcvr 17	REV 01	740-030589	S9AK450163	SFP+-10G-LPBK
Xcvr 18	REV 01	740-030589	S9AK450094	SFP+-10G-LPBK
Xcvr 19	REV 01	740-030589	S9AK450100	SFP+-10G-LPBK
Xcvr 20	REV 01	740-030589	S9AK450168	SFP+-10G-LPBK
Xcvr 21	REV 01	740-030589	S9AK450165	SFP+-10G-LPBK
Xcvr 22	REV 01	740-030589	S9AK450073	SFP+-10G-LPBK
Xcvr 23	REV 01	740-030589	S9AK450164	SFP+-10G-LPBK
Xcvr 24	REV 01	740-030589	S9AK450074	SFP+-10G-LPBK
Xcvr 25	REV 01	740-030589	SA62270195	SFP+-10G-LPBK
Xcvr 26	REV 01	740-030589	S9AK450078	SFP+-10G-LPBK

Xcvr 27	REV 01	740-030589	S9AK450024	SFP+-10G-LPBK
Xcvr 28	REV 01	740-030589	S9AK450027	SFP+-10G-LPBK
Xcvr 29	REV 01	740-030589	S9AK450080	SFP+-10G-LPBK
Xcvr 30	REV 01	740-030589	S9AK450030	SFP+-10G-LPBK
Xcvr 31	REV 01	740-030589	S9AK450025	SFP+-10G-LPBK
Xcvr 32	REV 01	740-030589	S9AK450023	SFP+-10G-LPBK
Xcvr 33	REV 01	740-030589	S9AK450075	SFP+-10G-LPBK
Xcvr 34	REV 01	740-030589	S9AK450161	SFP+-10G-LPBK
Xcvr 35	REV 01	740-030589	S9AK450071	SFP+-10G-LPBK
Xcvr 36	REV 01	740-030589	S9AK450072	SFP+-10G-LPBK
Xcvr 37	REV 01	740-030589	S9AK450022	SFP+-10G-LPBK
Xcvr 38	REV 01	740-030589	S9AK450021	SFP+-10G-LPBK
Xcvr 39	REV 01	740-030589	S9AK450175	SFP+-10G-LPBK
Xcvr 40	REV 01	740-030589	S9AK450162	SFP+-10G-LPBK
Xcvr 41	REV 01	740-030589	S99E270074	SFP+-10G-LPBK
Xcvr 42	REV 01	740-030589	S9AK450174	SFP+-10G-LPBK
Xcvr 43	REV 01	740-030589	S9AK450077	SFP+-10G-LPBK
Xcvr 44	REV 01	740-030589	S9AK450076	SFP+-10G-LPBK
Xcvr 45	REV 01	740-030589	S9AK450026	SFP+-10G-LPBK
Xcvr 46	REV 01	740-030589	S9AK450079	SFP+-10G-LPBK
Xcvr 47	REV 01	740-030589	S9AK450029	SFP+-10G-LPBK
PIC 1		BUILTIN	BUILTIN	15x 10G-SFP+
Xcvr 1	REV 01	740-032986	QA170087	QSFP+-40G-SR4
Xcvr 4	REV 01	740-032986	QA360442	QSFP+-40G-SR4
Xcvr 8	REV 01	740-032986	QA170091	QSFP+-40G-SR4
Xcvr 12	REV 01	740-032986	QA170042	QSFP+-40G-SR4
MGMT BRD	REV 08	750-036946	EE0731	QFX3500-MB
Power Supply 0	Rev 04	740-032091	UI00690	QFX PS 650W AC
Power Supply 1	Rev 04	740-032091	UI00679	QFX PS 650W AC
Fan Tray 0				QFX Fan Tray
Fan Tray 1				QFX Fan Tray

### show chassis hardware models (QFX3500 Switches)

```
user@switch> show chassis hardware models
```

Hardware inventory:				
Item	Version	Part number	Serial number	FRU model number
Routing Engine 0		BUILTIN	BUILTIN	
FPC 0	REV 02	711-032234	EC4074	
Power Supply 0	PSMI 2C	11-d65800	--	

### show chassis hardware clei-models (QFX3500 Switches)

```
user@switch> show chassis hardware clei-models
```

Hardware inventory:				
Item	Version	Part number	CLEI code	FRU model number
Routing Engine 0		BUILTIN		
FPC 0	REV 02	711-032234		
Power Supply 0	PSMI 2C	11-d65800		

### show chassis hardware clei-models (QFX5100 Switches)

```
user@switch> show chassis hardware clei-models
```

Hardware inventory:				
Item	Version	Part number	CLEI code	FRU model number
Routing Engine 0		BUILTIN	CMMNV10BRA	

FPC 0	REV 01	611-053010	CMMNV10BRA	
PIC 0		BUILTIN	CMMNV10BRA	
Power Supply 0	REV 03	740-053352	MUPABHBAA	JPSU-850W-AC-AFO
Power Supply 1	REV 03	740-053352	MUPABHBAA	JPSU-850W-AC-AFO
Fan Tray 0				QFX5100-96S-FANAF0
Fan Tray 1				QFX5100-96S-FANAF0
Fan Tray 2				QFX5100-96S-FANAF0

### show chassis hardware (QFX10002 Switches)

```
user@switch> show chassis hardware
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			12345	QFX10002-36Q
Pseudo CB 0				
Routing Engine 0		BUILTIN	BUILTIN	RE-QFX10002-36Q
FPC 0	REV 26	750-059497	ACNL1387	QFX10002-36Q
CPU		BUILTIN	BUILTIN	FPC CPU
PIC 0		BUILTIN	BUILTIN	36X40G
Xcvr 0	REV 01	740-038623	MOC15476230389	QSFP+-40G-CU1M
Xcvr 1	REV 01	740-038623	MOC15476230438	QSFP+-40G-CU1M
Xcvr 2	REV 01	740-038623	MOC15446231917	QSFP+-40G-CU1M
Xcvr 3	REV 01	740-038623	MOC15446232043	QSFP+-40G-CU1M
Xcvr 4	REV	740-038624	APF15470032AVB	QSFP+-40G-CU3M
Xcvr 5	REV	740-038624	APF15470032H15	QSFP+-40G-CU3M
Xcvr 6	REV	740-038624	APF15470032A9J	QSFP+-40G-CU3M
Xcvr 7	REV	740-038624	APF15470032AG7	QSFP+-40G-CU3M
Xcvr 8	REV	740-038624	APF15470032ALD	QSFP+-40G-CU3M
Xcvr 9	REV 01	740-053203	APF15470071V43	QSFP+-40G-ACU7M
Xcvr 10	REV 01	740-053203	APF15470071V15	QSFP+-40G-ACU7M
Xcvr 11	REV 01	740-053203	APF15470071V12	QSFP+-40G-ACU7M
Xcvr 13	REV	740-038624	APF15470032H1N	QSFP+-40G-CU3M
Xcvr 18	REV 01	740-053203	APF154800738HW	QSFP+-40G-ACU7M
Xcvr 19	REV 01	740-038153	MOC12161530041	QSFP+-40G-CU3M
Xcvr 20	REV 01	740-038153	APF15500034A29	QSFP+-40G-CU3M
Xcvr 30	REV 01	740-038623	MOC15476230444	QSFP+-40G-CU1M
Xcvr 31	REV 01	740-032986	QC330038	QSFP+-40G-SR4
Xcvr 32	REV 01	740-032986	QC290540	QSFP+-40G-SR4
Mezz	REV 02	711-059316	ACNG9344	QFX10002 36X40G Mezz
Power Supply 0	REV 03	740-054405	1EDN5389293	AC AFO 1600W PSU
Power Supply 1	REV 03	740-054405	1EDN5346300	AC AFO 1600W PSU
Fan Tray 0				QFX10002 Fan Tray 0,
Front to Back Airflow - AFO				
Fan Tray 1				QFX10002 Fan Tray 1,
Front to Back Airflow - AFO				
Fan Tray 2				QFX10002 Fan Tray 2,
Front to Back Airflow - AFO				

### show chassis hardware detail (QFX10002 Switches)

```
user@switch> show chassis hardware detail
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			12345	QFX10002-72Q
Pseudo CB 0				

Routing Engine 0		BUILTIN	BUILTIN	RE-QFX10002-72Q
ada0	8193 MB	QEMU	QM00001	Virtio Block Disk
ada1	4096 MB	QEMU	QM00002	Virtio Block Disk
ada2	512 MB	QEMU	QM00003	Virtio Block Disk
ada3	1024 MB	QEMU	QM00004	Virtio Block Disk
usb0 (addr 0.1)		UHCI root HUB 0	Intel	uhub0
usb0 (addr 1.1)		EHCI root HUB 0	Intel	uhub1
usb0 (addr 1.2)		product 0x0020 32	vendor 0x8087	uhub2
usb0 (addr 1.3)		Ultra Fit 21891	SanDisk	umass0
FPC 0	REV 05	750-055415	ACAM4724	QFX10002-72Q
CPU		BUILTIN	BUILTIN	FPC CPU

### show chassis hardware (QFX10008 and QFX10016 Switches)

```
user@switch> show chassis hardware
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			DE994	QFX10008
Midplane	REV 28	750-054097	ACPG3671	QFX10008 Midplane
Routing Engine 0		BUILTIN	BUILTIN	Routing Engine
Routing Engine 1		BUILTIN	BUILTIN	Routing Engine
CB 0	REV 03	750-068820	ACPA3224	Control Board
CB 1	REV 03	750-068820	ACPM9059	Control Board
FPC 0	REV 33	750-051354	ACNP4522	ULC-36Q-12Q28
CPU		BUILTIN	BUILTIN	FPC CPU
PIC 0		BUILTIN	BUILTIN	36X40G
Xcvr 0	REV 01	740-038623	MOC16016230802	QSFP+-40G-CU1M
Xcvr 1	REV 01	740-038623	MOC16016230802	QSFP+-40G-CU1M
Xcvr 2	REV 01	740-038623	MOC16016231080	QSFP+-40G-CU1M
Xcvr 3	REV 01	740-038623	MOC16016231080	QSFP+-40G-CU1M
Xcvr 4	REV	740-038624	APF16220038H15	QSFP+-40G-CU3M
Xcvr 5	REV	740-038624	APF16220038H5M	QSFP+-40G-CU3M
Xcvr 6	REV	740-038624	APF160600308W8	QSFP+-40G-CU3M
Xcvr 8	REV	740-038624	APF16210038FFL	QSFP+-40G-CU3M
Xcvr 9	REV	740-038624	APF16210038F6F	QSFP+-40G-CU3M
Xcvr 10	REV	740-038624	APF1605003032B	QSFP+-40G-CU3M
Xcvr 11	REV	740-038624	APF16070030CDB	QSFP+-40G-CU3M
Xcvr 13	REV	740-038624	APF16210038FEW	QSFP+-40G-CU3M
Xcvr 15	REV 01	740-052307	APF16100071C1L	QSFP+-40G-ACU7M
Xcvr 16	REV	740-038625	APF1623005048E	QSFP+-40G-CU5M
Xcvr 17	REV	740-038625	APF16230050471	QSFP+-40G-CU5M
Xcvr 18	REV	740-038625	APF1623005044D	QSFP+-40G-CU5M
Xcvr 19	REV 01	740-052307	APF16100071C30	QSFP+-40G-ACU7M
Xcvr 20	REV	740-038625	APF16290055004	QSFP+-40G-CU5M
Xcvr 21	REV 01	740-038153	APF1622003970G	QSFP+-40G-CU3M
Xcvr 22	REV	740-038624	APF16190036R90	QSFP+-40G-CU3M
Xcvr 23	REV	740-038624	APF16050030374	QSFP+-40G-CU3M
Xcvr 24	REV 01	740-038153	APF162400318HC	QSFP+-40G-CU3M
Xcvr 30	REV	740-038624	APF1606003097A	QSFP+-40G-CU3M
Xcvr 31	REV 01	740-052307	APF160500702R9	QSFP+-40G-ACU7M
Xcvr 32	REV	740-038624	APF16220038GVR	QSFP+-40G-CU3M
FPD Board	REV 07	711-054687	ACPC7158	QFX10000 FPD
Power Supply 0	REV 02	740-049388	1EDL63104D6	QFX10000 AC
Power Supply 1	REV 02	740-049388	1EDL62503XC	QFX10000 AC
Power Supply 2	REV 02	740-049388	1EDL62503XS	QFX10000 AC
Power Supply 3	REV 02	740-049388	1EDL62503T8	QFX10000 AC
Power Supply 4	REV 02	740-049388	1EDL62503TR	QFX10000 AC
Power Supply 5	REV 02	740-049388	1EDL62503T5	QFX10000 AC
FTC 0	REV 15	750-050108	ACPF4227	QFX10000 FTC

FTC 1	REV 15	750-050108	ACPF4228	QFX10000 FTC
Fan Tray 0	REV 09	760-054372	ACNV5506	QFX10008 FHB
Fan Tray 1	REV 09	760-054372	ACNV5365	QFX10008 FHB
SIB 0	REV 27	750-050058	ACPM4212	QFX10008 SIB
SIB 1	REV 27	750-050058	ACPM4253	QFX10008 SIB
SIB 2	REV 27	750-050058	ACPM4174	QFX10008 SIB
SIB 3	REV 27	750-050058	ACPM4191	QFX10008 SIB
SIB 4	REV 27	750-050058	ACPM4216	QFX10008 SIB
SIB 5	REV 27	750-050058	ACPM4286	QFX10008 SIB

### show chassis hardware detail (QFX10008 and QFX10016 Switches)

```
user@switch> show chassis hardware details
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			12345	QFX10008
Midplane	REV 01	750-054097	ACAM1754	QFX10008 Midplane
Routing Engine 0		BUILTIN	BUILTIN	Routing Engine
ada0	8193 MB	QEMU	QM00001	Virtio Block Disk
ada1	4096 MB	QEMU	QM00002	Virtio Block Disk
ada2	512 MB	QEMU	QM00003	Virtio Block Disk
ada3	1024 MB	QEMU	QM00004	Virtio Block Disk
usb0 (addr 1)	UHCI root HUB 0		Intel	uhub0
usb0 (addr 1)	EHCI root HUB 0		Intel	uhub1
usb0 (addr 2)	product 0x0020 32		vendor 0x8087	uhub2
Routing Engine 1		BUILTIN	BUILTIN	Routing Engine
ada0	8193 MB	QEMU	QM00001	Virtio Block Disk
ada1	4096 MB	QEMU	QM00002	Virtio Block Disk
ada2	512 MB	QEMU	QM00003	Virtio Block Disk
ada3	1024 MB	QEMU	QM00004	Virtio Block Disk
usb0 (addr 0.1)	UHCI root HUB 0		Intel	uhub0
usb0 (addr 1.1)	EHCI root HUB 0		Intel	uhub1
usb0 (addr 1.2)	product 0x0020 32		vendor 0x8087	uhub2
CB 0	REV 16	750-052688	ACAM7936	Control Board
CB 1	REV 18	750-052688	ACAM7708	Control Board
FPC 0	REV 26	750-051351	ACPJ1372	ULC-60S-6Q Main Board
CPU		BUILTIN	BUILTIN	FPC CPU

### show chassis hardware interconnect-device (QFabric Systems)

```
user@switch> show chassis hardware interconnect-device interconnect1
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis	REV 07			QFX_olive
Midplane	REV 07	750-021261	BH0208188289	QFX Midplane
CB 0	REV 07	750-021261	BH0208188289	QFXIC08-CB4S

### show chassis hardware node-device (QFabric Systems)

```
user@switch> show chassis hardware node-device node1
```

Routing Engine 0	BUILTIN	BUILTIN	QFX Routing Engine
node1	REV 05	711-032234	ED3694 QFX3500-48S4Q-AFI
CPU	BUILTIN	BUILTIN	FPC CPU
PIC 0	BUILTIN	BUILTIN	48x 10G-SFP+



```

Xcvr 8      REV 01  740-030658  AD0946A028B  SFP+-10G-USR
...

```

### show chassis hardware (PTX5000 Packet Transport Router)

```
user@host> show chassis hardware
```

```
Hardware inventory:
```

Item	Version	Part number	Serial number	Description
Chassis			JN11D1FD7AJA	PTX5000
Midplane	REV 03	711-031896	ABAC5589	Midplane-8S
FPM	REV 08	760-030647	EG1679	Front Panel Display
PDU 0	Rev 05	740-032019	ZE00006	DC Power Dist Unit
PSM 0	Rev 05	740-032022	ZJ00018	DC 12V Power Supply
PSM 1	Rev 04	740-032022	ZC00052	DC 12V Power Supply
PSM 2	Rev 04	740-032022	ZD00051	DC 12V Power Supply
PSM 3	Rev 05	740-032022	ZJ00060	DC 12V Power Supply
CCG 0	REV 04	750-030653	EG3703	Clock Generator
CCG 1	REV 04	750-030653	EG3698	Clock Generator
Routing Engine 0	REV 05	740-026942	P737A-002231	RE-DUO-2600
Routing Engine 1	REV 06	740-026942	P737A-002438	RE-DUO-2600
CB 0	REV 08	750-030625	EG5519	Control Board
CB 1	REV 08	750-030625	EG5516	Control Board
FPC 0	REV 18	750-036844	EJ3080	FPC
CPU	REV 12	711-030686	EJ3260	SNG PMB
FPC 2	REV 13	750-036844	EG5065	FPC
CPU	REV 09	711-030686	EG4082	SNG PMB
PIC 0	REV 14	750-031913	EG5127	24x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	143363A00240	SFP+-10G-SR
Xcvr 1	REV 01	740-031981	UK90PZ1	SFP+-10G-LR
Xcvr 2	REV 01	740-031980	AD1141A04XH	SFP+-10G-SR
Xcvr 3	REV 01	740-031981	UK90Q46	SFP+-10G-LR
Xcvr 4	REV 01	740-031980	AD1141A04X4	SFP+-10G-SR
Xcvr 6	REV 01	740-031980	B11H02560	SFP+-10G-SR
Xcvr 7	REV 01	740-031980	B11C01589	SFP+-10G-SR
Xcvr 8	REV 01	740-031980	AD1141A04XF	SFP+-10G-SR
Xcvr 10	REV 01	740-031980	123363A01094	SFP+-10G-SR
Xcvr 11	REV 01	740-031980	AK80LKF	SFP+-10G-SR
Xcvr 12	REV 01	740-031980	183363A01528	SFP+-10G-SR
Xcvr 14	REV 01	740-031980	193363A01079	SFP+-10G-SR
Xcvr 15	REV 01	740-031980	AK80MC8	SFP+-10G-SR
Xcvr 16	REV 01	740-031980	AJC0BHC	SFP+-10G-SR
Xcvr 19	REV 01	740-021309	J08D26856	SFP+-10G-LR
Xcvr 21	REV 01	740-031980	AK80KCT	SFP+-10G-SR
Xcvr 22	REV 01	740-031981	UK90PZL	SFP+-10G-LR
Xcvr 23	REV 01	740-031980	AK80N1V	SFP+-10G-SR
FPC 3	REV 13	750-036844	EG5074	FPC
CPU	REV 09	711-030686	EG4064	SNG PMB
PIC 1	REV 10	750-031903	EG0325	SNG Load
FPC 5	REV 06	750-036844	EH3198	FPC
CPU				
PIC 0	REV 14	750-031913	EG5134	24x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80LBH	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11B03724	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80FMH	SFP+-10G-SR
Xcvr 5	REV 01	740-031980	B11J00818	SFP+-10G-SR
Xcvr 6	REV 01	740-031980	193363A00743	SFP+-10G-SR
Xcvr 7	REV 01	740-031980	B11B06125	SFP+-10G-SR
Xcvr 10	REV 01	740-031980	B11H02529	SFP+-10G-SR
Xcvr 11	REV 01	740-031980	AK80LFB	SFP+-10G-SR

Xcvr 12	REV 01	740-031980	193363A01061	SFP+-10G-SR
Xcvr 15	REV 01	740-031980	B11J00687	SFP+-10G-SR
Xcvr 16	REV 01	740-031980	193363A00738	SFP+-10G-SR
Xcvr 18	REV 01	740-031980	AK80MQX	SFP+-10G-SR
Xcvr 19	REV 01	740-021309	J08C17257	SFP+-10G-LR
Xcvr 22	REV 01	740-031980	B11J00730	SFP+-10G-SR
Xcvr 23	REV 01	740-031980	AK80KEE	SFP+-10G-SR
PIC 1	REV 08	750-036710	EG3105	2x 40GE CFP
Xcvr 0	REV 01	740-034554	B260HLT	CFP-40G-LR4
Xcvr 1	REV 01	740-034554	B11C02847	CFP-40G-LR4
FPC 6	REV 18	750-036844	EJ4391	FPC
CPU	REV 12	711-030686	EJ3257	SNG PMB
FPC 7	REV 18	750-036844	EJ4382	FPC
CPU	REV 12	711-030686	EJ3238	SNG PMB
SPMB 0	REV 10	711-030686	EG5418	SNG PMB
SPMB 1	REV 09	711-030686	EG5373	SNG PMB
SIB 0	REV 07	750-030631	EG4858	SIB-I-8S
SIB 1	REV 07	750-030631	EG4872	SIB-I-8S
SIB 2	REV 07	750-030631	EG4866	SIB-I-8S
SIB 3	REV 07	750-030631	EG6011	SIB-I-8S
SIB 4	REV 07	750-030631	EG4907	SIB-I-8S
SIB 5	REV 07	750-030631	EG4879	SIB-I-8S
SIB 6	REV 07	750-030631	EG4864	SIB-I-8S
SIB 7	REV 07	750-030631	EG4899	SIB-I-8S
SIB 8	REV 07	750-030631	EG4880	SIB-I-8S
Fan Tray 0	REV 04	760-032784	EG1496	Vertical Fan Tray
Fan Tray 1	REV 04	760-030642	EG1335	Horizontal Fan Tray
Fan Tray 2	REV 02	760-030642	ED4952	Horizontal Fan Tray

### show chassis hardware (PTX5000 Packet Transport Router with AC PSM and PDU)

```
user@host> show chassis hardware
```

#### Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN12223A6AJA	PTX5000
Midplane	REV 16	750-035893	ACRA1350	Midplane-8S
FPM	REV 12	760-030647	BBBD5625	Front Panel Display
PDU 0	Rev 01	740-048338	1GB83360005	High Capacity AC WYE PDU
PSM 0	Rev 01	740-048334	1GB43360074	High Capacity AC PSM
PSM 1	Rev 01	740-048334	1GB43360001	High Capacity AC PSM
PSM 2	Rev 01	740-048334	1GB43360104	High Capacity AC PSM
PSM 3	Rev 01	740-048334	1GB43360042	High Capacity AC PSM
PSM 4	Rev 01	740-048334	1GB43360068	High Capacity AC PSM
PSM 5	Rev 01	740-048334	1GB43360080	High Capacity AC PSM
PSM 6	Rev 01	740-048334	1GB43360046	High Capacity AC PSM
PSM 7	Rev 01	740-048334	1GB43360100	High Capacity AC PSM
PDU 1	Rev 01	740-048338	1GB83360006	High Capacity AC WYE PDU
PSM 0	Rev 01	740-048334	1GB43360069	High Capacity AC PSM
PSM 1	Rev 01	740-048334	1GB43360099	High Capacity AC PSM
PSM 2	Rev 01	740-048334	1GB43360050	High Capacity AC PSM
PSM 3	Rev 01	740-048334	1GB43360095	High Capacity AC PSM
PSM 4	Rev 01	740-048334	1GB43360101	High Capacity AC PSM
PSM 5	Rev 01	740-048334	1GB43360075	High Capacity AC PSM
PSM 6	Rev 01	740-048334	1GB43360047	High Capacity AC PSM
PSM 7	Rev 01	740-048334	1GB43360019	High Capacity AC PSM
CCG 0	REV 09	750-030653	BBAZ5345	Clock Generator
...				

## show chassis hardware (PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```
user@host> show chassis hardware
```

```
Hardware inventory:
```

Item	Version	Part number	Serial number	Description
Chassis			JN1204FC0AJA	PTX5000
Midplane	REV 11	750-035893	ACAB8038	Midplane-8S
FPM	REV 12	760-030647	BBBD5619	Front Panel
Display				
PDU 0	Rev 04	740-048336	1GB93470043	High Capacity DC PDU
PSM 0	Rev 04	740-046988	1GB63500184	High Capacity DC PSM
PSM 2	Rev 04	740-046988	1GB63500169	High Capacity DC PSM
PSM 4	Rev 04	740-046988	1GB63500306	High Capacity DC PSM
PSM 6	Rev 04	740-046988	1GB63500074	High Capacity DC PSM
PDU 1	Rev 04	740-048336	1GB93470045	High Capacity DC PDU
PSM 1	Rev 04	740-046988	1GB63500193	High Capacity DC PSM
PSM 3	Rev 04	740-046988	1GB63500143	High Capacity DC PSM
PSM 5	Rev 04	740-046988	1GB63500146	High Capacity DC PSM
PSM 7	Rev 04	740-046988	1GB63500192	High Capacity DC PSM
CCG 0	REV 09	750-030653	BBBC1909	Clock Generator
CCG 1	REV 09	750-030653	BBBD2970	Clock Generator
...				

## show chassis hardware clei-models (PTX5000 Packet Transport Router)

```
user@host> show chassis hardware clei-models
```

```
Hardware inventory:
```

Item	Version	Part number	CLEI code	FRU model number
FPM	REV 08	760-030647	PROTOXCLEI	CRAFT-PTX5000-S
PDU 0	Rev 05	740-032019	IPUPAHLKAA	PWR-SAN-PDU-DC
PSM 0	Rev 05	740-032022	IPUPAHNKAA	PSM-PTX-DC-120-S
PSM 1	Rev 04	740-032022	032022XXXX	PWR-SAN-12-DC
PSM 2	Rev 04	740-032022	032022XXXX	PWR-SAN-12-DC
PSM 3	Rev 05	740-032022	IPUPAHNKAA	PSM-PTX-DC-120-S
CCG 0	REV 04	750-030653	PROTOXCLEI	CCG-PTX-S
CCG 1	REV 04	750-030653	PROTOXCLEI	CCG-PTX-S
Routing Engine 0	REV 05	740-026942		RE-DUO-C2600-16G-S
Routing Engine 1	REV 06	740-026942		RE-DUO-C2600-16G-S
CB 0	REV 08	750-030625	PROTOXCLEI	CB-PTX-S
CB 1	REV 08	750-030625	PROTOXCLEI	CB-PTX-S
FPC 0	REV 18	750-036844	PROTOXCLEI	FPC-PTX-P1-A
FPC 2	REV 13	750-036844	PROTOXCLEI	FPC-PTX-P1-A
PIC 0	REV 14	750-031913	PROTOXCLEI	P1-PTX-24-10GE-SFPP
FPC 3	REV 13	750-036844	PROTOXCLEI	FPC-PTX-P1-A
FPC 5				
PIC 0	REV 14	750-031913	PROTOXCLEI	P1-PTX-24-10GE-SFPP
FPC 6	REV 18	750-036844	PROTOXCLEI	FPC-PTX-P1-A
FPC 7	REV 18	750-036844	PROTOXCLEI	FPC-PTX-P1-A
SIB 0	REV 07	750-030631	PROTOXCLEI	SIB-I-PTX5008
SIB 1	REV 07	750-030631	PROTOXCLEI	SIB-I-PTX5008
SIB 2	REV 07	750-030631	PROTOXCLEI	SIB-I-PTX5008
SIB 3	REV 07	750-030631	PROTOXCLEI	SIB-I-PTX5008
SIB 4	REV 07	750-030631	PROTOXCLEI	SIB-I-PTX5008
SIB 5	REV 07	750-030631	PROTOXCLEI	SIB-I-PTX5008
SIB 6	REV 07	750-030631	PROTOXCLEI	SIB-I-PTX5008
SIB 7	REV 07	750-030631	PROTOXCLEI	SIB-I-PTX5008
SIB 8	REV 07	750-030631	PROTOXCLEI	SIB-I-PTX5008
Fan Tray 1	REV 04	760-030642	PROTOXCLEI	FAN-PTX-H-S

## show chassis hardware clei-models (PTX5000 Packet Transport Router with AC PSM and PDU)

```
user@host> show chassis hardware clei-models
```

```
Hardware inventory:
```

Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 16	750-035893	IPMUN00ARA	CHAS-MP-PTX5000-S
FPM	REV 12	760-030647	IPUCA7SCAA	CRAFT-PTX5000-S
PDU 0	Rev 01	740-048338	PROTOACPDU	PDU2-PTX-AC-W
PSM 0	Rev 01	740-048334	PROTOACPSM	PSM2-PTX-AC
PSM 1	Rev 01	740-048334	PROTOACPSM	PSM2-PTX-AC
PSM 2	Rev 01	740-048334	PROTOACPSM	PSM2-PTX-AC
PSM 3	Rev 01	740-048334	PROTOACPSM	PSM2-PTX-AC
PSM 4	Rev 01	740-048334	PROTOACPSM	PSM2-PTX-AC
PSM 5	Rev 01	740-048334	PROTOACPSM	PSM2-PTX-AC
PSM 6	Rev 01	740-048334	PROTOACPSM	PSM2-PTX-AC
PSM 7	Rev 01	740-048334	PROTOACPSM	PSM2-PTX-AC
PDU 1	Rev 01	740-048338	PROTOACPDU	PDU2-PTX-AC-W
PSM 0	Rev 01	740-048334	PROTOACPSM	PSM2-PTX-AC
PSM 1	Rev 01	740-048334	PROTOACPSM	PSM2-PTX-AC
PSM 2	Rev 01	740-048334	PROTOACPSM	PSM2-PTX-AC
PSM 3	Rev 01	740-048334	PROTOACPSM	PSM2-PTX-AC
PSM 4	Rev 01	740-048334	PROTOACPSM	PSM2-PTX-AC
PSM 5	Rev 01	740-048334	PROTOACPSM	PSM2-PTX-AC
PSM 6	Rev 01	740-048334	PROTOACPSM	PSM2-PTX-AC
PSM 7	Rev 01	740-048334	PROTOACPSM	PSM2-PTX-AC
CCG 0	REV 09	750-030653	IPUCA7DCAA	CCG-PTX-S
...				

## show chassis hardware clei-models (PTX5000 Packet Transport Router with FPC2-PTX-PIA)

```
user@host> show chassis hardware clei-models
```

```
Hardware inventory:
```

Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 11	750-035893	IPMUN00ARA	CHAS-MP-PTX5000-S
FPM	REV 12	760-030647	IPUCA7SCAA	CRAFT-PTX5000-S
PDU 0	Rev 04	740-048336	IPUPAL7KAA	PDU2-PTX-DC-S
PSM 0	Rev 04	740-046988	IPUPAL8KAA	PSM2-PTX-DC-S
PSM 2	Rev 04	740-046988	IPUPAL8KAA	PSM2-PTX-DC-S
PSM 4	Rev 04	740-046988	IPUPAL8KAA	PSM2-PTX-DC-S
PSM 6	Rev 04	740-046988	IPUPAL8KAA	PSM2-PTX-DC-S
PDU 1	Rev 04	740-048336	IPUPAL7KAA	PDU2-PTX-DC-S
PSM 1	Rev 04	740-046988	IPUPAL8KAA	PSM2-PTX-DC-S
PSM 3	Rev 04	740-046988	IPUPAL8KAA	PSM2-PTX-DC-S
PSM 5	Rev 04	740-046988	IPUPAL8KAA	PSM2-PTX-DC-S
PSM 7	Rev 04	740-046988	IPUPAL8KAA	PSM2-PTX-DC-S
CCG 0	REV 09	750-030653	IPUCA7DCAA	CCG-PTX-S
CCG 1	REV 09	750-030653	IPUCA7DCAA	CCG-PTX-S
...				

## show chassis hardware detail (PTX5000 Packet Transport Router)

```
user@host> show chassis hardware detail
```

```
Hardware inventory:
```

Item	Version	Part number	Serial number	Description
Chassis			JN1D1FD7AJA	PTX5000
Midplane	REV 03	711-031896	ABAC5589	Midplane-8S
FPM	REV 08	760-030647	EG1679	Front Panel Display

PDU 0	Rev 05	740-032019	ZE00006	DC Power Dist Unit
PSM 0	Rev 05	740-032022	ZJ00018	DC 12V Power Supply
PSM 1	Rev 04	740-032022	ZC00052	DC 12V Power Supply
PSM 2	Rev 04	740-032022	ZD00051	DC 12V Power Supply
PSM 3	Rev 05	740-032022	ZJ00060	DC 12V Power Supply
CCG 0	REV 04	750-030653	EG3703	Clock Generator
CCG 1	REV 04	750-030653	EG3698	Clock Generator
Routing Engine 0	REV 05	740-026942	P737A-002231	RE-DUO-2600
ad0	3823 MB	SMART CF	201006190039C02DC02D	Compact Flash
ad1	62720 MB	SMART Lite SATA Drive	2011042300CF4C6B4C6B	Disk 1
Routing Engine 1	REV 06	740-026942	P737A-002438	RE-DUO-2600
ad0	3823 MB	SMART CF	20100619053455F055F0	Compact Flash
ad1	62720 MB	SMART Lite SATA Drive	20110423000AE8E7E8E7	Disk 1
CB 0	REV 08	750-030625	EG5519	Control Board
CB 1	REV 08	750-030625	EG5516	Control Board
FPC 0	REV 18	750-036844	EJ3080	FPC
CPU	REV 12	711-030686	EJ3260	SNG PMB
FPC 2	REV 13	750-036844	EG5065	FPC
CPU	REV 09	711-030686	EG4082	SNG PMB
PIC 0	REV 14	750-031913	EG5127	24x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	143363A00240	SFP+-10G-SR
Xcvr 1	REV 01	740-031981	UK90PZ1	SFP+-10G-LR
Xcvr 2	REV 01	740-031980	AD1141A04XH	SFP+-10G-SR
Xcvr 3	REV 01	740-031981	UK90Q46	SFP+-10G-LR
Xcvr 4	REV 01	740-031980	AD1141A04X4	SFP+-10G-SR
Xcvr 6	REV 01	740-031980	B11H02560	SFP+-10G-SR
Xcvr 7	REV 01	740-031980	B11C01589	SFP+-10G-SR
Xcvr 8	REV 01	740-031980	AD1141A04XF	SFP+-10G-SR
Xcvr 10	REV 01	740-031980	123363A01094	SFP+-10G-SR
Xcvr 11	REV 01	740-031980	AK80LKF	SFP+-10G-SR
Xcvr 12	REV 01	740-031980	183363A01528	SFP+-10G-SR
Xcvr 14	REV 01	740-031980	193363A01079	SFP+-10G-SR
Xcvr 15	REV 01	740-031980	AK80MC8	SFP+-10G-SR
Xcvr 16	REV 01	740-031980	AJC0BHC	SFP+-10G-SR
Xcvr 19	REV 01	740-021309	J08D26856	SFP+-10G-LR
Xcvr 21	REV 01	740-031980	AK80KCT	SFP+-10G-SR
Xcvr 22	REV 01	740-031981	UK90PZL	SFP+-10G-LR
Xcvr 23	REV 01	740-031980	AK80N1V	SFP+-10G-SR
FPC 3	REV 13	750-036844	EG5074	FPC
CPU	REV 09	711-030686	EG4064	SNG PMB
PIC 1	REV 10	750-031903	EG0325	SNG Load
FPC 5	REV 06	750-036844	EH3198	FPC
CPU				
PIC 0	REV 14	750-031913	EG5134	24x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80LBH	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	B11B03724	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AK80FMH	SFP+-10G-SR
Xcvr 5	REV 01	740-031980	B11J00818	SFP+-10G-SR
Xcvr 6	REV 01	740-031980	193363A00743	SFP+-10G-SR
Xcvr 7	REV 01	740-031980	B11B06125	SFP+-10G-SR
Xcvr 10	REV 01	740-031980	B11H02529	SFP+-10G-SR
Xcvr 11	REV 01	740-031980	AK80LFB	SFP+-10G-SR
Xcvr 12	REV 01	740-031980	193363A01061	SFP+-10G-SR
Xcvr 15	REV 01	740-031980	B11J00687	SFP+-10G-SR
Xcvr 16	REV 01	740-031980	193363A00738	SFP+-10G-SR
Xcvr 18	REV 01	740-031980	AK80MQX	SFP+-10G-SR
Xcvr 19	REV 01	740-021309	J08C17257	SFP+-10G-LR
Xcvr 22	REV 01	740-031980	B11J00730	SFP+-10G-SR
Xcvr 23	REV 01	740-031980	AK80KEE	SFP+-10G-SR
PIC 1	REV 08	750-036710	EG3105	2x 40GE CFP

Xcvr 0	REV 01	740-034554	B260HLT	CFP-40G-LR4
Xcvr 1	REV 01	740-034554	B11C02847	CFP-40G-LR4
FPC 6	REV 18	750-036844	EJ4391	FPC
CPU	REV 12	711-030686	EJ3257	SNG PMB
FPC 7	REV 18	750-036844	EJ4382	FPC
CPU	REV 12	711-030686	EJ3238	SNG PMB
SPMB 0	REV 10	711-030686	EG5418	SNG PMB
SPMB 1	REV 09	711-030686	EG5373	SNG PMB
SIB 0	REV 07	750-030631	EG4858	SIB-I-8S
SIB 1	REV 07	750-030631	EG4872	SIB-I-8S
SIB 2	REV 07	750-030631	EG4866	SIB-I-8S
SIB 3	REV 07	750-030631	EG6011	SIB-I-8S
SIB 4	REV 07	750-030631	EG4907	SIB-I-8S
SIB 5	REV 07	750-030631	EG4879	SIB-I-8S
SIB 6	REV 07	750-030631	EG4864	SIB-I-8S
SIB 7	REV 07	750-030631	EG4899	SIB-I-8S
SIB 8	REV 07	750-030631	EG4880	SIB-I-8S
Fan Tray 0	REV 04	760-032784	EG1496	Vertical Fan Tray
Fan Tray 1	REV 04	760-030642	EG1335	Horizontal Fan Tray
Fan Tray 2	REV 02	760-030642	ED4952	Horizontal Fan Tray

#### show chassis hardware detail (PTX5000 Packet Transport Router with AC PSM and PDU)

```
user@host> show chassis hardware detail
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN12223A6AJA	PTX5000
Midplane	REV 16	750-035893	ACRA1350	Midplane-8S
FPM	REV 12	760-030647	BBBD5625	Front Panel Display
PDU 0	Rev 01	740-048338	1GB83360005	High Capacity AC WYE PDU
PSM 0	Rev 01	740-048334	1GB43360074	High Capacity AC PSM
PSM 1	Rev 01	740-048334	1GB43360001	High Capacity AC PSM
PSM 2	Rev 01	740-048334	1GB43360104	High Capacity AC PSM
PSM 3	Rev 01	740-048334	1GB43360042	High Capacity AC PSM
PSM 4	Rev 01	740-048334	1GB43360068	High Capacity AC PSM
PSM 5	Rev 01	740-048334	1GB43360080	High Capacity AC PSM
PSM 6	Rev 01	740-048334	1GB43360046	High Capacity AC PSM
PSM 7	Rev 01	740-048334	1GB43360100	High Capacity AC PSM
PDU 1	Rev 01	740-048338	1GB83360006	High Capacity AC WYE PDU
PSM 0	Rev 01	740-048334	1GB43360069	High Capacity AC PSM
PSM 1	Rev 01	740-048334	1GB43360099	High Capacity AC PSM
PSM 2	Rev 01	740-048334	1GB43360050	High Capacity AC PSM
PSM 3	Rev 01	740-048334	1GB43360095	High Capacity AC PSM
PSM 4	Rev 01	740-048334	1GB43360101	High Capacity AC PSM
PSM 5	Rev 01	740-048334	1GB43360075	High Capacity AC PSM
PSM 6	Rev 01	740-048334	1GB43360047	High Capacity AC PSM
PSM 7	Rev 01	740-048334	1GB43360019	High Capacity AC PSM
CCG 0	REV 09	750-030653	BBAZ5345	Clock Generator

#### show chassis hardware detail (PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```
user@host> show chassis hardware detail
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN1204FC0AJA	PTX5000

Midplane	REV 11	750-035893	ACAB8038	Midplane-8S
FPM	REV 12	760-030647	BBBD5619	Front Panel
Display				
PDU 0	Rev 04	740-048336	1GB93470043	High Capacity DC PDU
PSM 0	Rev 04	740-046988	1GB63500184	High Capacity DC PSM
PSM 2	Rev 04	740-046988	1GB63500169	High Capacity DC PSM
PSM 4	Rev 04	740-046988	1GB63500306	High Capacity DC PSM
PSM 6	Rev 04	740-046988	1GB63500074	High Capacity DC PSM
PDU 1	Rev 04	740-048336	1GB93470045	High Capacity DC PDU
PSM 1	Rev 04	740-046988	1GB63500193	High Capacity DC PSM
PSM 3	Rev 04	740-046988	1GB63500143	High Capacity DC PSM
PSM 5	Rev 04	740-046988	1GB63500146	High Capacity DC PSM
PSM 7	Rev 04	740-046988	1GB63500192	High Capacity DC PSM
CCG 0	REV 09	750-030653	BBBC1909	Clock Generator
CCG 1	REV 09	750-030653	BBBD2970	Clock Generator
...				

### show chassis hardware models (PTX5000 Packet Transport Router)

```
user@host> show chassis hardware models
```

Hardware inventory:

Item	Version	Part number	Serial number	FRU model number
FPM	REV 08	760-030647	EG1679	CRAFT-PTX5000-S
PDU 0	Rev 05	740-032019	ZE00006	PWR-SAN-PDU-DC
PSM 0	Rev 05	740-032022	ZJ00018	PSM-PTX-DC-120-S
PSM 1	Rev 04	740-032022	ZC00052	PWR-SAN-12-DC
PSM 2	Rev 04	740-032022	ZD00051	PWR-SAN-12-DC
PSM 3	Rev 05	740-032022	ZJ00060	PSM-PTX-DC-120-S
CCG 0	REV 04	750-030653	EG3703	CCG-PTX-S
CCG 1	REV 04	750-030653	EG3698	CCG-PTX-S
Routing Engine 0	REV 05	740-026942	P737A-002231	RE-DUO-C2600-16G-S
Routing Engine 1	REV 06	740-026942	P737A-002438	RE-DUO-C2600-16G-S
CB 0	REV 08	750-030625	EG5519	CB-PTX-S
CB 1	REV 08	750-030625	EG5516	CB-PTX-S
FPC 0	REV 18	750-036844	EJ3080	FPC-PTX-P1-A
FPC 2	REV 13	750-036844	EG5065	FPC-PTX-P1-A
PIC 0	REV 14	750-031913	EG5127	P1-PTX-24-10GE-SFPP
FPC 3	REV 13	750-036844	EG5074	FPC-PTX-P1-A
FPC 5				
PIC 0	REV 14	750-031913	EG5134	P1-PTX-24-10GE-SFPP
FPC 6	REV 18	750-036844	EJ4391	FPC-PTX-P1-A
FPC 7	REV 18	750-036844	EJ4382	FPC-PTX-P1-A
SIB 0	REV 07	750-030631	EG4858	SIB-I-PTX5008
SIB 1	REV 07	750-030631	EG4872	SIB-I-PTX5008
SIB 2	REV 07	750-030631	EG4866	SIB-I-PTX5008
SIB 3	REV 07	750-030631	EG6011	SIB-I-PTX5008
SIB 4	REV 07	750-030631	EG4907	SIB-I-PTX5008
SIB 5	REV 07	750-030631	EG4879	SIB-I-PTX5008
SIB 6	REV 07	750-030631	EG4864	SIB-I-PTX5008
SIB 7	REV 07	750-030631	EG4899	SIB-I-PTX5008
SIB 8	REV 07	750-030631	EG4880	SIB-I-PTX5008
Fan Tray 1	REV 04	760-030642	EG1335	FAN-PTX-H-S

### show chassis hardware models (PTX5000 Packet Transport Router with AC PSM and PDU)

```
user@host> show chassis hardware models
```

## Hardware inventory:

Item	Version	Part number	Serial number	FRU model number
Midplane	REV 16	750-035893	ACRA1350	CHAS-MP-PTX5000-S
FPM	REV 12	760-030647	BBBD5625	CRAFT-PTX5000-S
PDU 0	Rev 01	740-048338	1GB83360005	PDU2-PTX-AC-W
PSM 0	Rev 01	740-048334	1GB43360074	PSM2-PTX-AC
PSM 1	Rev 01	740-048334	1GB43360001	PSM2-PTX-AC
PSM 2	Rev 01	740-048334	1GB43360104	PSM2-PTX-AC
PSM 3	Rev 01	740-048334	1GB43360042	PSM2-PTX-AC
PSM 4	Rev 01	740-048334	1GB43360068	PSM2-PTX-AC
PSM 5	Rev 01	740-048334	1GB43360080	PSM2-PTX-AC
PSM 6	Rev 01	740-048334	1GB43360046	PSM2-PTX-AC
PSM 7	Rev 01	740-048334	1GB43360100	PSM2-PTX-AC
PDU 1	Rev 01	740-048338	1GB83360006	PDU2-PTX-AC-W
PSM 0	Rev 01	740-048334	1GB43360069	PSM2-PTX-AC
PSM 1	Rev 01	740-048334	1GB43360099	PSM2-PTX-AC
PSM 2	Rev 01	740-048334	1GB43360050	PSM2-PTX-AC
PSM 3	Rev 01	740-048334	1GB43360095	PSM2-PTX-AC
PSM 4	Rev 01	740-048334	1GB43360101	PSM2-PTX-AC
PSM 5	Rev 01	740-048334	1GB43360075	PSM2-PTX-AC
PSM 6	Rev 01	740-048334	1GB43360047	PSM2-PTX-AC
PSM 7	Rev 01	740-048334	1GB43360019	PSM2-PTX-AC
CCG 0	REV 09	750-030653	BBAZ5345	CCG-PTX-S
...				

## show chassis hardware models (PTX5000 Packet Transport Router with FPC2-PTX-P1A)

user@host&gt; show chassis hardware models

## Hardware inventory:

Item	Version	Part number	Serial number	FRU model number
Midplane	REV 11	750-035893	ACAB8038	CHAS-MP-PTX5000-S
FPM	REV 12	760-030647	BBBD5619	CRAFT-PTX5000-S
PDU 0	Rev 04	740-048336	1GB93470043	PDU2-PTX-DC-S
PSM 0	Rev 04	740-046988	1GB63500184	PSM2-PTX-DC-S
PSM 2	Rev 04	740-046988	1GB63500169	PSM2-PTX-DC-S
PSM 4	Rev 04	740-046988	1GB63500306	PSM2-PTX-DC-S
PSM 6	Rev 04	740-046988	1GB63500074	PSM2-PTX-DC-S
PDU 1	Rev 04	740-048336	1GB93470045	PDU2-PTX-DC-S
PSM 1	Rev 04	740-046988	1GB63500193	PSM2-PTX-DC-S
PSM 3	Rev 04	740-046988	1GB63500143	PSM2-PTX-DC-S
PSM 5	Rev 04	740-046988	1GB63500146	PSM2-PTX-DC-S
PSM 7	Rev 04	740-046988	1GB63500192	PSM2-PTX-DC-S
CCG 0	REV 09	750-030653	BBBC1909	CCG-PTX-S
CCG 1	REV 09	750-030653	BBBD2970	CCG-PTX-S
...				

## show chassis hardware extensive (PTX5000 Packet Transport Router)

user@host&gt; show chassis hardware extensive

## Hardware inventory:

Item	Version	Part number	Serial number	Description
.....				
PDU 0	Rev 04	740-032019	UE0003	DC Power Dist Unit
Jedec Code:	0x7fb0		EEPROM Version:	0x02
P/N:	740-032019		S/N:	UE0003
Assembly ID:	0x043d		Assembly Version:	04.00
Date:	11-29-2010		Assembly Flags:	0x00



```

Version:      Rev 04          CLEI Code:      032022XXXX
ID: DC Power Dist Unit      FRU Model Number: PWR-SAN-PDU-DC
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 3d 04 00 52 65 76 20 30 34 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 33 32 30 31 39 00 00
Address 0x20: 53 2f 4e 20 55 45 30 30 30 33 00 00 00 1d 0b 07
Address 0x30: da ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 30 33 32 30 32 32 58 58 58 58 50
Address 0x50: 57 52 2d 53 41 4e 2d 50 44 55 2d 44 43 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 a3 ff ff ff ff ff ff ff ff ff ff ff ff
PSM 0          Rev 04      740-032022      YG00065          DC 12V Power Supply
Module
Jedec Code:    0x7fb0          EEPROM Version:    0x02
P/N:           740-032022      S/N:              YG00065
Assembly ID:   0x0440          Assembly Version:  04.00
Date:          07-30-2010      Assembly Flags:    0x00
Version:       Rev 04          CLEI Code:        032022XXXX
ID: DC 12V Power Supply Module FRU Model Number: PWR-SAN-12-DC
Board Information Record:
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 04 40 04 00 52 65 76 20 30 34 00 00
Address 0x10: 00 00 00 00 37 34 30 2d 30 33 32 30 32 32 00 00
Address 0x20: 53 2f 4e 20 59 47 30 30 30 36 35 00 00 1e 07 07
Address 0x30: da ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
Address 0x40: ff ff ff ff 01 30 33 32 30 32 32 58 58 58 58 50
Address 0x50: 57 52 2d 53 41 4e 2d 31 32 2d 44 43 20 20 20 20
Address 0x60: 20 20 20 20 20 20 01 00 ff ff ff ff ff ff ff ff
Address 0x70: ff ff ff 0c ff ff ff ff ff ff ff ff ff ff ff ff

```

### show chassis hardware extensive (PTX1000 Packet Transport Router)

```
user@host> show chassis hardware extensive
```

```

Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis                               UNDEFINED    PTX1000
Pseudo CB 0
Routing Engine 0
FPC 0          REV 06    750-053330   ACAM4850       PTX1000-FPC-P2-BUILTIN
CPU            BUILTIN   BUILTIN      FPC CPU
PIC 0          BUILTIN   BUILTIN      288X10GE/72X40GE/24X100GE

Xcvr 2         REV 01    740-046565   QE240845       QSFP+-40G-SR4
Xcvr 3         REV 01    740-046565   QE240962       QSFP+-40G-SR4
Xcvr 5         REV 01    740-032986   ES400LZ        QSFP+-40G-SR4
Xcvr 12        REV 01    740-054053   QE419452       QSFP+-4X10G-SR
Xcvr 18        REV 01    740-054053   QE419481       QSFP+-4X10G-SR
Xcvr 30        REV 01    740-046565   QE440485       QSFP+-40G-SR4
Xcvr 48        REV 01    740-032986   ES400K3        QSFP+-40G-SR4
Xcvr 68        REV 01    740-046565   QF2805J3       QSFP+-40G-SR4
Mezz           REV 05    711-053333   ACAM4282       Mezzanine Board
Power Supply 2  REV 01    740-054405   1EDN4470131    AC AFO 1600W PSU
Power Supply 3  REV 01    740-054405   1EDN4470112    AC AFO 1600W PSU
Fan Tray 0                               PTX1000 Fan Tray 0, Front
to Back Airflow - AFO
Fan Tray 1                               PTX1000 Fan Tray 1, Front

```

```

to Back Airflow - AFO
Fan Tray 2
to Back Airflow - AFO
PTX1000 Fan Tray 2, Front

```

### show chassis hardware extensive (PTX5000 with Control Board 2)

```

user@host> show chassis hardware grep CB

```

CB 0	REV 06	750-055537	ACLZ9541	Control Board 2
CB 1	REV 06	750-055537	ACLY5329	Control Board 2

### show chassis hardware (MX Routers with Media Services Blade [MSB])

```

user@switch> show chassis hardware

```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN1100FB1AFB	MX480
Midplane	REV 05	710-017414	TR3310	MX480 Midplane
FPM Board	REV 02	710-017254	KG1872	Front Panel Display
PEM 2	Rev 02	740-017343	QCS0812A00N	DC Power Entry Module
PEM 3	Rev 02	740-017343	QCS0812A00U	DC Power Entry Module
Routing Engine 0	REV 07	740-015113	1000740938	RE-S-1300
CB 0	REV 03	710-021523	KF4630	MX SCB
FPC 1	REV 11	750-037207	ZW9726	AS-MCC
CPU	REV 04	711-038173	ZW4819	AS-MCC PMB
MIC 0	REV 06	750-037214	ZW3574	AS-MSC
PIC 0		BUILTIN	BUILTIN	AS-MSC
MIC 1	REV 00	750-037211		AS-MXC
PIC 2		BUILTIN	BUILTIN	AS-MXC

### show chassis hardware extensive (MX Routers with Media Services Blade [MSB])

```

user@switch> show chassis hardware extensive

```

FPC 1	REV 11	750-037207	ZW9726	AS-MCC
Jedec Code:	0x7fb0	EEPROM Version:	0x02	
P/N:	750-037207	S/N:	ZW9726	
Assembly ID:	0x0b37	Assembly Version:	01.11	
Date:	02-17-2012	Assembly Flags:	0x00	
Version:	REV 11	CLEI Code:	PROTOXCLEI	
ID:	AS-MCC	FRU Model Number:	750-037207	
Board Information Record:				
Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff				
I2C Hex Data:				
Address 0x00: 7f b0 02 ff 0b 37 01 0b 52 45 56 20 31 31 00 00				
Address 0x10: 00 00 00 00 37 35 30 2d 30 33 37 32 30 37 00 00				
Address 0x20: 53 2f 4e 20 5a 57 39 37 32 36 00 00 00 11 02 07				
Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff				
Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 37				
Address 0x50: 35 30 2d 30 33 37 32 30 37 00 00 00 00 00 00 00				
Address 0x60: 00 00 00 00 00 00 31 31 00 ff ff ff ff ff ff ff ff				
Address 0x70: ff ff ff 5e ff ff ff ff ff ff ff ff ff ff ff ff				
CPU	REV 04	711-038173	ZW4819	AS-MCC-PMB
Jedec Code:	0x7fb0	EEPROM Version:	0x02	
P/N:	711-038173	S/N:	ZW4819	
Assembly ID:	0x0b38	Assembly Version:	01.04	
Date:	12-30-2011	Assembly Flags:	0x00	

```

Version:      REV 04
ID: AS-MCC PMB
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 38 01 04 52 45 56 20 30 34 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 33 38 31 37 33 00 00
  Address 0x20: 53 2f 4e 20 5a 57 34 38 31 39 00 00 00 1e 0c 07
  Address 0x30: db ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 50 52 4f 54 4f 58 43 4c 45 49 37
  Address 0x50: 31 31 2d 30 33 38 31 37 33 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 30 34 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 60 00 00 00 00 00 00 00 00 00 00 00 00
MIC 0          REV 06      750-037214      ZW3574      AS-MSC
Jedec Code:    0x7fb0      EEPROM Version:    0x02
P/N:           750-037214      S/N:           ZW3574
Assembly ID:   0x0a44      Assembly Version: 01.06
Date:          02-19-2012      Assembly Flags: 0x00
Version:       REV 06      CLEI Code:      PROTOXCLEI
ID: AS-MSC      FRU Model Number: 750-037214
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0a 44 01 06 52 45 56 20 30 36 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 33 37 32 31 34 00 00
  Address 0x20: 53 2f 4e 20 5a 57 33 35 37 34 00 00 00 13 02 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 37
  Address 0x50: 35 30 2d 30 33 37 32 31 34 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 30 36 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 60 c0 03 e5 f4 00 00 00 00 00 00 00 00
PIC 0          BUILTIN      BUILTIN      AS-MSC
MIC 1          REV 00      750-037211      AS-MXC
Jedec Code:    0x7fb0      EEPROM Version:    0x01
P/N:           750-037211
Assembly ID:   0x0a43      Assembly Version: 01.00
Date:          255-255-65535  Assembly Flags: 0x00
Version:       REV 00
ID: AS-MXC
Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
  Address 0x00: 7f b0 01 ff 0a 43 01 00 52 45 56 20 30 30 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 33 37 32 31 31 00 00
  Address 0x20: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x30: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
  Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff c0 02 e6 6c 7f b0 02 ff 0a 44 01 06
PIC 2          BUILTIN      BUILTIN      AS-MXC

```

### show chassis hardware (ACX5048 Router)

```
user@host> show chassis hardware
```

```
Hardware inventory:
```

Item	Version	Part number	Serial number	Description
Chassis			VF3714170810	ACX5048

Pseudo CB 0				
Routing Engine 0		BUILTIN	BUILTIN	ACX5K Routing Engine
FPC 0	REV 05	650-056267	VF3714170810	ACX5048
CPU		BUILTIN	BUILTIN	FPC CPU
PIC 0		BUILTIN	BUILTIN	48x10G-6x40G
Xcvr 0	REV 02	740-011613	NR2051S	SFP-SX
Xcvr 33	REV 01	740-030589	SE5N290041	SFP+-10G-LPBK
Xcvr 35	REV 01	740-030589	SE5N290926	SFP+-10G-LPBK
Xcvr 37	REV 01	740-030589	SE5N290049	SFP+-10G-LPBK
Xcvr 39	REV 01	740-030589	SE5N290046	SFP+-10G-LPBK
Xcvr 48		NON-JNPR	409310098	UNKNOWN
Power Supply 1	REV 03	740-041741	1GA24081097	JPSU-650W-AC-AFO
Fan Tray 0				ACX5K Fan Tray 0, Front
to Back Airflow - AFO				
Fan Tray 1				ACX5K Fan Tray 1, Front
to Back Airflow - AFO				
Fan Tray 2				ACX5K Fan Tray 2, Front
to Back Airflow - AFO				
Fan Tray 3				ACX5K Fan Tray 3, Front
to Back Airflow - AFO				
Fan Tray 4				ACX5K Fan Tray 4, Front
to Back Airflow - AFO				

#### show chassis hardware detail (ACX5048 Router)

```
user@host> show chassis hardware detail
```

##### Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			VF3714170810	ACX5048
Pseudo CB 0				
Routing Engine 0		BUILTIN	BUILTIN	ACX5K Routing Engine
ad0	509 MB	QEMU HARDDISK	QM00001	Hard Disk
ad1	4095 MB	QEMU HARDDISK	QM00002	Hard Disk
ad2	511 MB	QEMU HARDDISK	QM00003	Hard Disk
ad3	1023 MB	QEMU HARDDISK	QM00004	Hard Disk
usb0 (addr 1)	product 0x0000 0		vendor 0x0000	uhub1
usb0 (addr 2)	product 0x0020 32		vendor 0x8087	uhub2
FPC 0	REV 05	650-056267	VF3714170810	ACX5048
CPU		BUILTIN	BUILTIN	FPC CPU
PIC 0		BUILTIN	BUILTIN	48x10G-6x40G
Xcvr 0	REV 02	740-011613	NR2051S	SFP-SX
Xcvr 33	REV 01	740-030589	SE5N290041	SFP+-10G-LPBK
Xcvr 35	REV 01	740-030589	SE5N290926	SFP+-10G-LPBK
Xcvr 37	REV 01	740-030589	SE5N290049	SFP+-10G-LPBK
Xcvr 39	REV 01	740-030589	SE5N290046	SFP+-10G-LPBK
Xcvr 48		NON-JNPR	409310098	UNKNOWN
Power Supply 1	REV 03	740-041741	1GA24081097	JPSU-650W-AC-AFO
Fan Tray 0				ACX5K Fan Tray 0, Front
to Back Airflow - AFO				
Fan Tray 1				ACX5K Fan Tray 1, Front
to Back Airflow - AFO				
Fan Tray 2				ACX5K Fan Tray 2, Front
to Back Airflow - AFO				
Fan Tray 3				ACX5K Fan Tray 3, Front
to Back Airflow - AFO				
Fan Tray 4				ACX5K Fan Tray 4, Front
to Back Airflow - AFO				

**show chassis hardware clei-models (ACX5048 Router)**

```
user@host> show chassis hardware clei-models
```

Hardware inventory:

Item	Version	Part number	CLEI code	FRU model number
Routing Engine 0		BUILTIN	CMMRG00BRA	ACX5048
FPC 0	REV 05	650-056267	CMMRG00BRA	ACX5048
PIC 0		BUILTIN	CMMRG00BRA	ACX5048
Power Supply 1	REV 03	740-041741	CMUPABHBAA	JPSU-650W-AC-AFO
Fan Tray 0				ACX5K-FAN
Fan Tray 1				ACX5K-FAN
Fan Tray 2				ACX5K-FAN
Fan Tray 3				ACX5K-FAN
Fan Tray 4				ACX5K-FAN

**show chassis hardware models (ACX5048 Router)**

```
user@host> show chassis hardware models
```

Hardware inventory:

Item	Version	Part number	Serial number	FRU model number
Routing Engine 0		BUILTIN	BUILTIN	ACX5048
FPC 0	REV 05	650-056267	VF3714170810	ACX5048
PIC 0		BUILTIN	BUILTIN	ACX5048
Power Supply 1	REV 03	740-041741	1GA24081097	JPSU-650W-AC-AFO
Fan Tray 0				ACX5K-FAN
Fan Tray 1				ACX5K-FAN
Fan Tray 2				ACX5K-FAN
Fan Tray 3				ACX5K-FAN
Fan Tray 4				ACX5K-FAN

**show chassis hardware (ACX5096 Router)**

```
user@host> show chassis hardware
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			VB3714510139	ACX5096
Pseudo CB 0				
Routing Engine 0		BUILTIN	BUILTIN	ACX5K Routing Engine
FPC 0	REV 09	650-053391	VB3714510139	ACX5096
CPU		BUILTIN	BUILTIN	FPC CPU
PIC 0		BUILTIN	BUILTIN	96x10G-8x40G
Xcvr 0	REV 01	740-021308	ARS186H	SFP+-10G-SR
Xcvr 2	REV 01	740-031851	AM1045SUA1G	SFP-SX
Xcvr 10	REV 02	740-011613	NS11KRP	SFP-SX
Xcvr 14	REV 01	740-031980	AMCOLKL	SFP+-10G-SR
Xcvr 20	REV 01	740-021308	ARS18A2	SFP+-10G-SR
Xcvr 30	REV 02	740-011613	PJ21954	SFP-SX
Xcvr 35	REV 01	740-031851	PN344LV	SFP-SX
Xcvr 40	REV 01	740-031851	PLG028R	SFP-SX
Xcvr 41	REV 01	740-021308	L12D01919	SFP+-10G-SR
Xcvr 46	REV 01	740-011613	PD91F10	SFP-SX
Xcvr 64	REV 01	740-031980	AMS0YSS	SFP+-10G-SR
Xcvr 96	REV 01	740-032986	QE481421	QSFP+-40G-SR4
Xcvr 99	REV 01	740-032986	QE494942	QSFP+-40G-SR4
Xcvr 100	REV 01	740-032986	QE494756	QSFP+-40G-SR4
Power Supply 0	REV 01	740-053352	1GD14220106	JPSU-850W-AC-AFO
Power Supply 1	REV 01	740-053352	1GD14220102	JPSU-850W-AC-AFO

```

Fan Tray 0
to Back Airflow - AFO
Fan Tray 1
to Back Airflow - AFO
Fan Tray 2
to Back Airflow - AFO

```

ACX5K Fan Tray 0, Front

ACX5K Fan Tray 1, Front

ACX5K Fan Tray 2, Front

### show chassis hardware detail (ACX5096 Router)

```
user@host> show chassis hardware detail
```

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			VB3714510139	ACX5096
Pseudo CB 0				
Routing Engine 0		BUILTIN	BUILTIN	ACX5K Routing Engine
ad0	509 MB	QEMU HARDDISK	QM00001	Hard Disk
ad1	4095 MB	QEMU HARDDISK	QM00002	Hard Disk
ad2	511 MB	QEMU HARDDISK	QM00003	Hard Disk
ad3	1023 MB	QEMU HARDDISK	QM00004	Hard Disk
usb0 (addr 1)	product	0x0000 0	vendor 0x0000	uhub1
usb0 (addr 2)	product	0x0020 32	vendor 0x8087	uhub2
FPC 0	REV 09	650-053391	VB3714510139	ACX5096
CPU		BUILTIN	BUILTIN	FPC CPU
PIC 0		BUILTIN	BUILTIN	96x10G-8x40G
Xcvr 0	REV 01	740-021308	ARS186H	SFP+-10G-SR
Xcvr 10	REV 02	740-011613	NS11KRP	SFP-SX
Xcvr 14	REV 01	740-031980	AMCOLKL	SFP+-10G-SR
Xcvr 20	REV 01	740-021308	ARS18A2	SFP+-10G-SR
Xcvr 30	REV 02	740-011613	PJ21954	SFP-SX
Xcvr 41	REV 01	740-021308	L12D01919	SFP+-10G-SR
Xcvr 46	REV 01	740-011613	PD91F10	SFP-SX
Xcvr 64	REV 01	740-031980	AMS0YSS	SFP+-10G-SR
Xcvr 78	REV 01	740-031851	AM1045SUA1G	SFP-SX
Xcvr 96	REV 01	740-032986	QE481421	QSFP+-40G-SR4
Xcvr 99	REV 01	740-032986	QE494942	QSFP+-40G-SR4
Xcvr 100	REV 01	740-032986	QE494756	QSFP+-40G-SR4
Power Supply 0	REV 01	740-053352	1GD14220106	JPSU-850W-AC-AFO
Power Supply 1	REV 01	740-053352	1GD14220102	JPSU-850W-AC-AFO
Fan Tray 0				ACX5K Fan Tray 0, Front
to Back Airflow - AFO				
Fan Tray 1				ACX5K Fan Tray 1, Front
to Back Airflow - AFO				
Fan Tray 2				ACX5K Fan Tray 2, Front
to Back Airflow - AFO				

### show chassis hardware clei-models (ACX5096 Router)

```
user@host> show chassis hardware clei-models
```

Hardware inventory:

Item	Version	Part number	CLEI code	FRU model number
Routing Engine 0		BUILTIN	CMMNX10BRA	ACX5096
FPC 0	REV 09	650-053391	CMMNX10BRA	ACX5096
PIC 0		BUILTIN	CMMNX10BRA	ACX5096
Power Supply 0	REV 01	740-053352	CMUPACSBAA	JPSU-850W-AC-AFO
Power Supply 1	REV 01	740-053352	CMUPACSBAA	JPSU-850W-AC-AFO
Fan Tray 0				ACX5K-FAN

Fan Tray 1	ACX5K-FAN
Fan Tray 2	ACX5K-FAN

### show chassis hardware models (ACX5096 Router)

```
user@host> show chassis hardware models
```

```
Hardware inventory:
Item                Version  Part number  Serial number  FRU model number
Routing Engine 0
FPC 0              REV 09  650-053391  VB3714510139  ACX5096
  PIC 0            BUILTIN  BUILTIN      ACX5096
Power Supply 0     REV 01  740-053352  1GD14220106  JPSU-850W-AC-AFO
Power Supply 1     REV 01  740-053352  1GD14220102  JPSU-850W-AC-AFO
Fan Tray 0
Fan Tray 1
Fan Tray 2          ACX5K-FAN
                  ACX5K-FAN
                  ACX5K-FAN
```

### show chassis hardware (ACX500 Router)

```
user@host> show chassis hardware
```

```
Hardware inventory:
Item                Version  Part number  Serial number  Description
Chassis
Midplane            REV 01  650-055932  VJ0214510035  ACX500-AC
Routing Engine
FEB 0               BUILTIN  BUILTIN      Routing Engine
                  BUILTIN  BUILTIN      Forwarding Engine
Processor
FPC 0
  MIC 0             BUILTIN  BUILTIN      FPC BUILTIN
    PIC 0           BUILTIN  BUILTIN      2x 1GE(LAN) SFP
      Xcvr 0        REV 01  740-031851  PMF2Y3C       SFP-SX
      Xcvr 1        REV 01  740-031851  PN342QN       SFP-SX
    MIC 1           BUILTIN  BUILTIN      4x 1GE(LAN) SFP, RJ45
      PIC 1         BUILTIN  BUILTIN      4x 1GE(LAN) SFP, RJ45
        Xcvr 0      REV 01  740-011613  PF30K0L       SFP-SX
    MIC 2           BUILTIN  BUILTIN      MS BUILTIN
      PIC 2         BUILTIN  BUILTIN      MS BUILTIN
```

### show chassis hardware detail (ACX500 Router)

```
user@host> show chassis hardware detail
```

```
Hardware inventory:
Item                Version  Part number  Serial number  Description
Chassis
Midplane            REV 01  650-055932  VJ0214510035  ACX500-AC
Routing Engine
da0 3820 MB USB DISK 2.0 BUILTIN  BUILTIN      Routing Engine
FEB 0               BUILTIN  BUILTIN      Nand Flash 0
                  BUILTIN  BUILTIN      Forwarding Engine
Processor
FPC 0
  MIC 0             BUILTIN  BUILTIN      FPC BUILTIN
    PIC 0           BUILTIN  BUILTIN      2x 1GE(LAN) SFP
      Xcvr 0        REV 01  740-031851  PMF2Y3C       SFP-SX
      Xcvr 1        REV 01  740-031851  PN342QN       SFP-SX
    MIC 1           BUILTIN  BUILTIN      4x 1GE(LAN) SFP, RJ45
      PIC 1         BUILTIN  BUILTIN      4x 1GE(LAN) SFP, RJ45
```

Xcvr 0	REV 01	740-011613	PF30K0L	SFP-SX
MIC 2		BUILTIN	BUILTIN	MS BUILTIN
PIC 2		BUILTIN	BUILTIN	MS BUILTIN

### show chassis hardware extensive (ACX500 Router)

```
user@host> show chassis hardware extensive
```

#### Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			VJ0214510035	ACX500-AC
Jedec Code:	0x7fb0		EEPROM Version:	0x02
			S/N:	VJ0214510035
Assembly ID:	0x057c		Assembly Version:	00.00
Date:	00-00-0000		Assembly Flags:	0x00
ID:	ACX500-AC			

#### Board Information Record:

Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

#### I2C Hex Data:

Address 0x00: 7f b0 02 ff 05 7c 00 00 00 00 00 00 00 00 00 00

Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Address 0x20: 56 4a 30 32 31 34 35 31 30 30 33 35 00 00 00 00

Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Midplane	REV 01	650-055932	VJ0214510035	ACX500-AC
Jedec Code:	0x7fb0		EEPROM Version:	0x02
P/N:	650-055932		S/N:	VJ0214510035
Assembly ID:	0x057c		Assembly Version:	01.00
Date:	12-23-2014		Assembly Flags:	0x00
Version:	REV 01		CLEI Code:	PROTOXCLEI
ID:	ACX500-AC		FRU Model Number:	ACX500-AC

#### Board Information Record:

Address 0x00: ad 01 00 80 f0 1c 2d 1b 60 80 ff ff ff ff ff ff

#### I2C Hex Data:

Address 0x00: 7f b0 02 fe 05 7c 01 00 52 45 56 20 30 31 00 00

Address 0x10: 00 00 00 00 36 35 30 2d 30 35 35 39 33 32 00 00

Address 0x20: 56 4a 30 32 31 34 35 31 30 30 33 35 00 17 0c 07

Address 0x30: de ff ff ff ad 01 00 80 f0 1c 2d 1b 60 80 ff ff

Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 41

Address 0x50: 43 58 35 30 30 2d 41 43 00 00 00 00 00 00 00 00

Address 0x60: 00 00 00 00 00 00 30 41 00 ff ff ff ff ff ff ff

Address 0x70: ff ff ff 93 56 4a 30 32 31 34 35 31 30 30 33 35

Routing Engine	BUILTIN	BUILTIN	Routing Engine
da0 3820 MB USB DISK 2.0			Nand Flash 0
FEB 0	BUILTIN	BUILTIN	Forwarding Engine

#### Processor

FPC 0	BUILTIN	BUILTIN	FPC BUILTIN	
MIC 0	BUILTIN	BUILTIN	2x 1GE(LAN) SFP	
Jedec Code:	0x0000		EEPROM Version:	0x00
P/N:	BUILTIN		S/N:	BUILTIN
Assembly ID:	0x0a40		Assembly Version:	00.00
Date:	00-00-0000		Assembly Flags:	0x00
ID:	2x 1GE(LAN) SFP			

#### Board Information Record:

Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

#### I2C Hex Data:

Address 0x00: 00 00 00 00 0a 40 00 00 00 00 00 00 00 00 00 00



```

Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 49 6e 76 61
Address 0x20: 42 55 49 4c 54 49 4e 00 49 6e 76 61 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 de ad be ef 64 20 22 a8 60 af 21 38
  PIC 0          BUILTIN      BUILTIN      2x 1GE(LAN) SFP
    Xcvr 0      REV 01      740-031851    PMF2Y3C      SFP-SX
    Xcvr 1      REV 01      740-031851    PN342QN      SFP-SX
  MIC 1          BUILTIN      BUILTIN      4x 1GE(LAN) SFP, RJ45
Jedec Code: 0x0000      EEPROM Version: 0x00
P/N: BUILTIN      S/N: BUILTIN
Assembly ID: 0x0aac      Assembly Version: 00.00
Date: 00-00-0000      Assembly Flags: 0x00
ID: 4x 1GE(LAN) SFP, RJ45
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a ac 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 49 6e 76 61
Address 0x20: 42 55 49 4c 54 49 4e 00 49 6e 76 61 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 00 00 00 00 64 20 b5 c0 60 af 21 38
  PIC 1          BUILTIN      BUILTIN      4x 1GE(LAN) SFP, RJ45
    Xcvr 0      REV 01      740-011613    PF30K0L      SFP-SX
  MIC 2          BUILTIN      BUILTIN      MS BUILTIN
Jedec Code: 0x0000      EEPROM Version: 0x00
P/N: BUILTIN      S/N: BUILTIN
Assembly ID: 0x0aaf      Assembly Version: 00.00
Date: 00-00-0000      Assembly Flags: 0x00
ID: MS BUILTIN
Board Information Record:
Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I2C Hex Data:
Address 0x00: 00 00 00 00 0a af 00 00 00 00 00 00 00 00 00 00
Address 0x10: 00 00 00 00 42 55 49 4c 54 49 4e 00 49 6e 76 61
Address 0x20: 42 55 49 4c 54 49 4e 00 49 6e 76 61 00 00 00 00
Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Address 0x70: 00 00 00 00 de ad be ef 64 22 cd 48 60 af 21 38
  PIC 2          BUILTIN      BUILTIN      MS BUILTIN

```

### show chassis hardware clei-models (ACX500 Router)

```
user@host> show chassis hardware clei-models
```

```
Hardware inventory:
```

Item	Version	Part number	CLEI code	FRU model number
Midplane	REV 01	650-055932	PROTOXCLEI	ACX500-AC
Routing Engine		BUILTIN		
FEB 0		BUILTIN		
FPC 0		BUILTIN		


**show chassis hardware models (ACX500 Router)**

```
user@host> show chassis hardware models
```

```
Hardware inventory:
```

Item	Version	Part number	Serial number	FRU model number
Midplane	REV 01	650-055932	VJ0214510035	ACX500-AC
Routing Engine		BUILTIN	BUILTIN	
FEB 0		BUILTIN	BUILTIN	
FPC 0		BUILTIN	BUILTIN	

## show chassis in-service-upgrade

<b>Syntax</b>	<code>show chassis in-service-upgrade</code>
<b>Syntax (EX9253 Switches)</b>	<code>show chassis in-service-upgrade</code>
<b>Release Information</b>	<p>Command introduced in Junos OS Release 9.0.</p> <p>Command introduced in Junos OS Release 12.3R2, 13.1R2, and 13.2R1 for TX Matrix Plus routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 13.2 for PTX5000 routers.</p> <p>Command introduced in Junos OS Release 13.2X51-D15 for the QFX Series.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 18.2 for EX9253 Switches.</p>
<b>Description</b>	<p>Display the status of Flexible PIC Concentrators (FPCs) and their corresponding PICs after the most recent unified in-service software upgrade (ISSU). This command must be issued on the master Routing Engine.</p>
	<p> <b>NOTE:</b> Only Intelligent Queuing (IQ) PICs are displayed by this command output. Unified ISSU status for other PIC types is controlled internally by the FPC.</p>
<b>Options</b>	This command has no options.
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <i>request system software abort</i></li> <li>• <i>request system software in-service-upgrade</i></li> <li>• <i>Getting Started with Unified In-Service Software Upgrade</i></li> <li>• <i>Example: Performing a Unified ISSU</i></li> </ul>
<b>List of Sample Output</b>	<p><a href="#">show chassis in-service-upgrade on page 1994</a></p> <p><a href="#">show chassis in-service-upgrade (MX2010 Router) on page 1994</a></p> <p><a href="#">show chassis in-service-upgrade (MX2020 Router) on page 1994</a></p> <p><a href="#">show chassis in-service-upgrade (MX2008 Router) on page 1995</a></p> <p><a href="#">show chassis in-service-upgrade (TX Matrix Plus Router) on page 1995</a></p> <p><a href="#">show chassis in-service-upgrade (QFX5100 Switch) on page 1996</a></p>

[show chassis in-service-upgrade \(EX9253 Switch\) on page 1996](#)

**Output Fields** [Table 144 on page 1994](#) lists the output fields for the **show chassis in-service-upgrade** command. Output fields are listed in the approximate order in which they appear.

*Table 144: show chassis in-service-upgrade Output Fields*

Field Name	Field Description
<b>Item</b>	Flexible PIC Concentrator (FPC) slot number.
<b>Status</b>	FPC and corresponding PIC state. State can be either of the following: <ul style="list-style-type: none"> <li>• <b>Online</b>—FPC is online and running.</li> <li>• <b>Offline</b>—FPC is powered down.</li> </ul>
<b>Reason</b>	Reason for the state (if offline).

## Sample Output

### show chassis in-service-upgrade

```
user@host> show chassis in-service-upgrade
```

Item	Status	Reason
FPC 0	Online	
FPC 1	Online	
FPC 2	Online	
PIC 0	Online	
PIC 1	Online	
FPC 3	Offline	Offlined by CLI command
FPC 4	Online	
PIC 1	Online	
FPC 5	Online	
PIC 0	Online	
FPC 6	Online	
PIC 3	Online	
FPC 7	Online	

### show chassis in-service-upgrade (MX2010 Router)

```
user@host> show chassis in-service-upgrade
```

Item	Status	Reason
FPC 0	Online	
FPC 1	Online	
FPC 8	Online	
FPC 9	Online	

### show chassis in-service-upgrade (MX2020 Router)

```
user@host> show chassis in-service-upgrade
```

Item	Status	Reason
FPC 0	Online	
FPC 1	Online	

```

FPC 2      Online
FPC 3      Online
FPC 4      Online
FPC 5      Online
FPC 6      Online
FPC 7      Online
FPC 8      Online
FPC 9      Online
FPC 10     Online
FPC 11     Online
FPC 12     Online
FPC 13     Online
FPC 14     Online
FPC 15     Online
FPC 16     Online
FPC 17     Online
FPC 18     Online
FPC 19     Online

```

### show chassis in-service-upgrade (MX2008 Router)

```
user@host> show chassis in-service-upgrade
```

Item	Status	Reason
FPC 0	Online	
FPC 3	Online	
FPC 5	Online	
FPC 7	Online	
FPC 9	Online	

### show chassis in-service-upgrade (TX Matrix Plus Router)

```
user@host> show chassis in-service-upgrade
```

```
1cc0-re0:
```

Item	Status	Reason
FPC 1	Online	
PIC 0	Online	
FPC 2	Online	
FPC 3	Online	
PIC 1	Online	
FPC 4	Online	
FPC 6	Online	
FPC 7	Online	

```
1cc1-re0:
```

Item	Status	Reason
FPC 0	Online	
PIC 3	Online	
FPC 1	Online	
FPC 2	Online	
FPC 4	Online	
FPC 6	Online	
FPC 7	Online	

```
1cc2-re0:
```

Item	Status	Reason
FPC 0	Online	
FPC 2	Online	
FPC 3	Online	
PIC 0	Online	
FPC 4	Online	
FPC 6	Online	
FPC 7	Online	
PIC 1	Online	

lcc3-re0:

---

Item	Status	Reason
FPC 0	Online	
PIC 0	Online	
FPC 1	Online	
FPC 2	Online	
FPC 3	Online	
PIC 2	Online	
FPC 4	Online	
FPC 5	Online	
FPC 6	Online	
FPC 7	Online	
PIC 1	Online	

#### show chassis in-service-upgrade (QFX5100 Switch)

```
user@switch> show chassis in-service-upgrade
```

Item	Status	Reason
FPC 0	Online (ISSU)	

#### show chassis in-service-upgrade (EX9253 Switch)

```
user@switch> show chassis in-service-upgrade
```

Item	Status	Reason
FPC 0	Online	
FPC 1	Online	

## show chassis lccs

<b>Syntax</b>	show chassis lccs
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	(TX Matrix and TX Matrix Plus routers only ) On a TX Matrix router, display the status of all T640 LCC connected to the TX Matrix router. On a TX Matrix Plus router, display the status of all LCC connected to the TX Matrix Plus router.
<b>Options</b>	This command has no options.
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">request chassis lcc on page 868</a></li> <li>• <i>Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade</i></li> <li>• <i>fpc</i></li> </ul>
<b>List of Sample Output</b>	<a href="#">show chassis lccs on page 1997</a> <a href="#">show chassis lccs (TX Matrix Plus router with 3D SIBs) on page 1998</a>
<b>Output Fields</b>	Table 145 on page 1997 lists the output fields for the <b>show chassis lccs</b> command. Output fields are listed in the approximate order in which they appear.

*Table 145: show chassis lccs Output Fields*

Field Name	Field Description
<b>Slot</b>	LCC slot number.
<b>State</b>	LCC status: <ul style="list-style-type: none"> <li>• <b>Online</b>—LCC is online and running.</li> <li>• <b>Offline</b>—LCC is powered down.</li> <li>• <b>Empty</b>—No LCC is present.</li> </ul>
<b>Uptime</b>	How long the LCC has been up and running.

## Sample Output

### show chassis lccs

```
user@host> show chassis lccs
```

Slot	State	Uptime
0	Online	3 minutes, 17 seconds
1	Empty	
2	Online	3 minutes, 23 seconds
3	Empty	

#### show chassis lccs (TX Matrix Plus router with 3D SIBs)

```
user@host> show chassis lccs
```

Slot	State	Uptime
0	Offline	
1	Empty	
2	Online	1 day, 4 hours, 57 minutes, 7 seconds
3	Empty	
4	Online	1 day, 4 hours, 56 minutes, 58 seconds
5	Empty	
6	Empty	
7	Online	3 hours, 45 minutes, 41 seconds



## show chassis lcc-mode

**Syntax** `show chassis lcc-mode`

**Release Information** Command introduced in Junos OS Release 13.1.

**Description** (TX Matrix Plus routers only) Display the mode in which LCCs are connected to a TX Matrix Plus router.



**NOTE:** This command is supported only on TX Matrix Plus routers with 3D SIBs.

**Options** This command has no options.

**Required Privilege Level** view

**Related Documentation**

- [lcc-mode on page 688](#)
- *Routing Matrix with a TXP-Mixed-LCC-3D Configuration*

**List of Sample Output** [show chassis lcc-mode \(TX Matrix Plus Router with 3D SIBs\) on page 1999](#)

**Output Fields** [Table 146 on page 1999](#) lists the output fields for the **show chassis lcc-mode** command. Output fields are listed in the approximate order in which they appear.

*Table 146: show chassis lcc-mode Output Fields*

Field Name	Field Description
Slot	The LCC number.
LCC-mode	Displays the mode of the LCC: <ul style="list-style-type: none"> <li>• <b>T1600</b>—LCC functions as a T1600 router.</li> <li>• <b>T4000</b>—LCC functions as a T4000 router.</li> <li>• <b>EMPTY</b>—LCC is not configured as either a T1600 or a T4000 router.</li> </ul>

## Sample Output

[show chassis lcc-mode \(TX Matrix Plus Router with 3D SIBs\)](#)

```
user@host> show chassis lcc-mode
```

Slot	LCC-mode
0	T4000
1	EMPTY
2	T4000
3	EMPTY
4	T4000
5	EMPTY
6	T1600
7	EMPTY

## show chassis location

<b>List of Syntax</b>	<a href="#">Syntax on page 2001</a> <a href="#">Syntax (TX Matrix Router) on page 2001</a> <a href="#">Syntax (TX Matrix Plus Router) on page 2001</a> <a href="#">Syntax (MX Series Router) on page 2001</a> <a href="#">Syntax (QFX Series) on page 2001</a> <a href="#">Syntax (OCX Series) on page 2001</a>
<b>Syntax</b>	show chassis location
<b>Syntax (TX Matrix Router)</b>	show chassis location <fpc   interface (by-name <i>name</i>   by-slot fpc number lcc number)   lcc number   scc>
<b>Syntax (TX Matrix Plus Router)</b>	show chassis location <fpc   interface (by-name <i>name</i>   by-slot fpc number lcc number)   lcc number   sfc number>
<b>Syntax (MX Series Router)</b>	show chassis location <all-members> <local> <member <i>member-id</i> >
<b>Syntax (QFX Series)</b>	show chassis location <interconnect-device <i>name</i> > <node-device <i>name</i> >
<b>Syntax (OCX Series)</b>	show chassis location
<b>Release Information</b>	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. <b>sfc</b> option introduced for the TX Matrix Plus router in Junos OS Release 9.6. Command introduced in Junos OS Release 11.1 for the QFX Series. Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
<b>Description</b>	Display the physical location of the chassis. This command can only be used on the master Routing Engine.
<b>Options</b>	<b>none</b> —Display all information about the physical location of the chassis. On a TX Matrix router, display all information about the physical location of the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display all information about the physical location of the TX Matrix Plus router and its attached routers.

**all-members**—(MX Series routers only) (Optional) Display the physical location of the chassis for all the member routers in the Virtual Chassis configuration.

**fpc**—(TX Matrix router and TX Matrix Plus router only) (Optional) Display the physical location of all Flexible PIC Concentrators (FPCs).

**interconnect-device *name***—(QFabric systems only) (Optional) Display the physical location of the Interconnect device.

**interface by-name *name***—(TX Matrix and TX Matrix Plus routers only) (Optional) Display the physical location of a specified interface name. On a TX Matrix router, this option displays the FPC number and T640 router (line-card chassis) number associated with the specified interface. On a TX Matrix Plus router, this option displays the FPC number and router (line-card chassis) number associated with the specified interface.

**interface by-slot *fpc number lcc number***—(TX Matrix and TX Matrix Plus router only) (Optional) On a TX Matrix router, display the global FPC number of an interface by specifying its local FPC number and T640 router (line-card chassis) number. On a TX Matrix Plus router, display the global FPC number of an interface by specifying its local FPC number and router (line-card chassis) number.

- The global FPC number is the FPC slot number when all the FPC slots in the routing matrix are considered: **0** through **31**. On TX Matrix Plus router with 3D SIBs, the value is **0** through **63**. The local FPC number is the FPC slot number on a particular T640 router.
- For **fpc**, replace *number* with a value from **0** through **7**.
- For **lcc**, replace *number* with a value from **0** through **7**.

**lcc *number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display the physical location of a specified T640 router (line-card chassis) that is connected to a TX Matrix router. On a TX Matrix Plus router, display the physical location of a specified router (line-card chassis) that is connected to a TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers only) (Optional) Display the physical location of the chassis for the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Display the physical location of the chassis for the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

**node-device *name***—(QFabric systems only) (Optional) Display the physical location of the Node device.

**scc**—(TX Matrix routers only) (Optional) Display the physical location of the TX Matrix router (switch-card chassis).

**sfc**—(TX Matrix Plus routers only) (Optional) Display the physical location of the TX Matrix Plus router (or switch-fabric chassis).

**Required Privilege Level** view

**Related Documentation**

- *Displaying Chassis Physical Locations for a Routing Matrix with a TX Matrix Plus Router*

**List of Sample Output**

[show chassis location on page 2004](#)  
[show chassis location fpc \(TX Matrix Router\) on page 2004](#)  
[show chassis location interface by-slot \(TX Matrix Router\) on page 2004](#)  
[show chassis location fpc \(TX Matrix Plus Router\) on page 2004](#)  
[show chassis location interface by-slot \(TX Matrix Plus Router\) on page 2004](#)  
[show chassis location \(QFX Series and OCX Series\) on page 2004](#)  
[show chassis location \(QFabric Systems\) on page 2005](#)

**Output Fields** [Table 147 on page 2003](#) lists the output fields for the **show chassis location** command. Output fields are listed in the approximate order in which they appear.

*Table 147: show chassis location Output Fields*

Field Name	Field Description
country-code	Country code information.
postal-code	Postal code information.
Building	Building information.
Floor	Floor information.
Global FPC	Global FPC number. The FPC slot number, when all FPC slots in the routing matrix are considered. The range of values is 0 through 31. On TX Matrix Plus router with 3D SIBs the value is 0 through 63.
LATA	Local access transport area information.

*Table 147: show chassis location Output Fields (continued)*

Field Name	Field Description
LCC	Line-card chassis number. On a TX Matrix router, the number of a particular T640 router connected to the TX Matrix router. On a TX Matrix Plus router, the number of a particular router connected to the TX Matrix Plus router.
Local FPC	Local FPC number. On a TX Matrix router, the FPC slot number on a particular T640 router. On a TX Matrix Plus router, the FPC slot number on a particular router.

## Sample Output

### show chassis location

```
user@host> show chassis location
country-code: US
postal-code: 94404
Building: Building 2, Floor: 2
```

### show chassis location fpc (TX Matrix Router)

```
user@host> show chassis location fpc
Global FPC    LCC    Local FPC
    17         2        1
    21         2        5
```

### show chassis location interface by-slot (TX Matrix Router)

```
user@host> show chassis location interface by-slot fpc 1 lcc 1
Global FPC: 9
```

### show chassis location fpc (TX Matrix Plus Router)

```
user@host> show chassis location fpc
Global FPC    LCC    Local FPC
    0         0        0
    1         0        1
```

### show chassis location interface by-slot (TX Matrix Plus Router)

```
user@host> show chassis location interface by-slot fpc 2 lcc 1
Global FPC: 10
```

### show chassis location (QFX Series and OCX Series)

```
user@switch> show chassis location
```

```
country-code: US  
postal-code: 94404  
Building: Building 2, Floor: 2
```

#### show chassis location (QFabric Systems)

```
user@switch> show chassis location interconnect-device interconnect1
```

```
country-code: US  
postal-code: 94404  
Building: Building 2, Floor: 2
```

## show chassis mac-addresses

---

**List of Syntax**    [Syntax on page 2006](#)  
                         [Syntax \(TX Matrix Router\) on page 2006](#)  
                         [Syntax \(TX Matrix Plus Router\) on page 2006](#)  
                         [Syntax \(MX Series Router\) on page 2006](#)  
                         [Syntax \(MX104, MX204, MX2010, MX2020, MX10003, MX2008, and MX10008 Universal Routing Platforms\) on page 2006](#)  
                         [Syntax \(PTX Series\) on page 2006](#)  
                         [Syntax \(QFX Series\) on page 2006](#)  
                         [Syntax \(OCX Series\) on page 2007](#)  
                         [Syntax \(ACX Series Universal Metro Routers\) on page 2007](#)  
                         [Syntax \(ACX5048 and ACX5096 Routers\) on page 2007](#)  
                         [Syntax \(ACX500 Routers\) on page 2007](#)  
                         [Syntax \(EX9251, EX9253 Switches\) on page 2007](#)

<b>Syntax</b>	show chassis mac-addresses
---------------	----------------------------

<b>Syntax (TX Matrix Router)</b>	show chassis mac-addresses <lcc <i>number</i>   scc>
----------------------------------	---

<b>Syntax (TX Matrix Plus Router)</b>	show chassis mac-addresses <lcc <i>number</i>   sfc <i>number</i> >
---------------------------------------	--

<b>Syntax (MX Series Router)</b>	show chassis mac-addresses <all-members> <local> <member <i>member-id</i> >
----------------------------------	--

<b>Syntax (MX104, MX204, MX2010, MX2020, MX10003, MX2008, and MX10008 Universal Routing Platforms)</b>	show chassis mac-addresses
--	----------------------------

<b>Syntax (PTX Series)</b>	show chassis mac-addresses
----------------------------	----------------------------

<b>Syntax (QFX Series)</b>	show chassis mac-addresses <interconnect-device <i>name</i> > <node-group <i>name</i> >
----------------------------	---



Syntax (OCX Series)	show chassis mac-addresses
Syntax (ACX Series Universal Metro Routers)	show chassis mac-addresses
Syntax (ACX5048 and ACX5096 Routers)	show chassis mac-addresses
Syntax (ACX500 Routers)	show chassis mac-addresses
Syntax (EX9251, EX9253 Switches)	show chassis mac-addresses
Release Information	<p>Command introduced before JUNOS Release 7.4.</p> <p>Command introduced in JUNOS Release 9.0 for EX Series switches.</p> <p>sfc option introduced for the TX Matrix Plus router in JUNOS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for QFX Series.</p> <p>Command introduced in Junos OS Release 12.2 for ACX Series Universal Metro Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 15.1X54-D20 for ACX5048 and ACX5096 Routers.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.2 for PTX10008 Routers.</p> <p>Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.3 for MX150 Router Appliance.</p> <p>Command introduced in Junos OS Release 17.4 for MX204 Universal Routing Platforms.</p> <p>Command introduced in JUNOS Release 18.1R1 for EX9251 switches.</p> <p>Command introduced in Junos OS Release 18.2 for EX9253 Switches.</p> <p>Command introduced in Junos OS Release 18.2 for MX10008 Universal Routing Platforms.</p>
Description	Display the media access control (MAC) addresses for the router, switch chassis, or switch.
Options	<p><b>none</b>—(TX Matrix, TX Matrix Plus routers, QFX Series, and OCX Series Switches) Display the MAC addresses for the router chassis or switch. On a TX Matrix router, display MAC addresses on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display MAC addresses on the TX Matrix Plus router and its attached routers.</p> <p><b>all-members</b>—(MX Series routers only) (Optional) Display the MAC addresses for all the member routers of the Virtual Chassis configuration.</p> <p><b>interconnect-device <i>name</i></b>—(QFabric switches only) (Optional) Display the MAC addresses for the Interconnect device.</p>

**lcc *number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display MAC addresses for a specified T640 router (or line-card chassis) that is connected to the TX Matrix Plus router. On a TX Matrix Plus router, display MAC addresses for a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers only) (Optional) Display the MAC addresses for the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Display the MAC addresses for the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

**node-group *name***—(QFabric switches only) (Optional) Display the MAC addresses for the specified Node group.

**scc**—(TX Matrix routers only) (Optional) Display MAC addresses for the TX Matrix router (or switch-card chassis).

**sfc *number***—(TX Matrix Plus routers only) (Optional) Display MAC addresses for the TX Matrix Plus router (or switch-fabric chassis).

**Required Privilege Level**

view

**Related Documentation**

- *ACX2000 and ACX2100 Routers Hardware and CLI Terminology Mapping*

**List of Sample Output**

[show chassis mac-addresses on page 2009](#)  
[show chassis mac-addresses \(MX150\) on page 2010](#)  
[show chassis mac-addresses \(MX104 Router\) on page 2010](#)  
[show chassis mac-addresses \(MX2010 Router\) on page 2010](#)  
[show chassis mac-addresses \(MX2020 Router\) on page 2010](#)  
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[show chassis mac-addresses \(MX10003\) on page 2010](#)  
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[show chassis mac-addresses \(PTX10008 Router\) on page 2011](#)  
[show chassis mac-addresses \(TX Matrix Router\) on page 2011](#)  
[show chassis mac-addresses \(TX Matrix Plus Router\) on page 2012](#)  
[show chassis mac-addresses \(QFX Series and OCX Series \) on page 2012](#)  
[show chassis mac-addresses interconnect-device \(QFabric Switches\) on page 2013](#)  
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[show chassis mac-addresses \(ACX2000 Universal Metro Router\) on page 2013](#)  
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[show chassis mac-addresses \(ACX500 Routers\) on page 2013](#)  
[show chassis mac-addresses \(EX9251 Switches\) on page 2013](#)  
[show chassis mac-addresses \(EX9253 Switches\) on page 2014](#)

**Output Fields** [Table 148 on page 2009](#) lists the output fields for the **show chassis mac-addresses** command. Output fields are listed in the approximate order in which they appear.

*Table 148: show chassis mac-addresses Output Fields*

Field Name	Field Description
<b>MAC address information</b>	
Public base address	<p>Base address of the MAC addresses allocated to this router or switch, for example 00:24:dc:18:09:40. This address is also printed on the box of the device.</p> <p>Public MAC addresses are those addresses your switch/router assigns to Ethernet interfaces. The public base address is the first MAC address your device assigns to an interface. Consecutive public count MAC addresses are reserved for additional interfaces.</p>
	<p>Number of allocated public addresses, for example 64. Public addresses are calculated starting with the public base address. If the public base address is 00:24:dc:18:09:40, then The MAC address of ge-0/0/0 on this device is 00:24:dc:18:09:40, and ge-0/0/1 is 00:24:dc:18:09:41, and so on, up to 64 available addresses.</p>
Private base address	<p>Base address of the private MAC addresses allocated to this router or switch. The private base address is the first MAC address after the allocated consecutive public count addresses. For example, if 00:24:dc:18:09:40 is the public base and 0x40 is the public count in hex, then 00:24:dc:18:09:80 would be the private base.</p>
Private count	Number of allocated private addresses.

## Sample Output

**show chassis mac-addresses**

```

user@host> show chassis mac-addresses
MAC address information
Public base address  0:90:69:0:4:0
Public count        1008
Private base address 0:90:69:0:7:f0
Private count        16

```

### show chassis mac-addresses (MX150)

```
user@host > show chassis mac-addresses

MAC address information:
  Public base address    f4:cc:55:2b:4c:00
  Public count           1984
  Private base address   f4:cc:55:2b:53:c0
  Private count          64
```

The MAC address displayed is the actual MAC address of the first physical port.

### show chassis mac-addresses (MX104 Router)

```
user@host > show chassis mac-addresses

MAC address information:
  Public base address    b0:a8:6e:a1:e8:58
  Public count           2032
  Private base address   b0:a8:6e:a1:f0:48
  Private count          16
```

### show chassis mac-addresses (MX2010 Router)

```
user@host> show chassis mac-addresses

MAC address information:
  Public base address    64:87:88:04:50:00
  Public count           1984
  Private base address   64:87:88:04:57:c0
  Private count          64
```

### show chassis mac-addresses (MX2020 Router)

```
user@host> show chassis mac-addresses

MAC address information:
  Public base address    2c:21:72:70:20:00
  Public count           4032
  Private base address   2c:21:72:70:2f:c0
  Private count          64
```

### show chassis mac-addresses (MX2008 Router)

```
user@host> show chassis mac-addresses

MAC address information:
  Public base address    f4:cc:55:3e:35:00
  Public count           1984
  Private base address   f4:cc:55:3e:3c:c0
  Private count          64
```

### show chassis mac-addresses (MX10003)

```
user@host> show chassis mac-addresses

MAC address information:
```

```
Public base address    28:8a:1c:6f:78:5c
Public count          3904
Private base address   28:8a:1c:6f:87:9c
Private count          192
```

### show chassis mac-addresses (MX204)

```
user@host> show chassis mac-addresses
```

```
MAC address information:
Public base address    38:4f:49:80:18:00
Public count          2032
Private base address   38:4f:49:80:1f:f0
Private count          16
```

### show chassis mac-addresses (MX10008)

```
user@host> show chassis mac-addresses
```

```
MAC address information:
Public base address    30:b6:4f:e9:74:c4
Public count          1856
Private base address   30:b6:4f:e9:7c:04
Private count          192
```

### show chassis mac-addresses (PTX10008 Router)

```
user@host> show chassis mac-addresses
```

```
MAC address information:
Public base address    30:b6:4f:0a:7a:bb
Public count          1856
Private base address   30:b6:4f:0a:81:fb
Private count          192
```

### show chassis mac-addresses (TX Matrix Router)

```
user@host> show chassis mac-addresses
```

```
scc-re0:
```

```
-----
MAC address information:
Public base address    00:05:85:9e:cc:00
Public count          8064
Private base address   00:05:85:9e:eb:80
Private count          128
```

```
lcc0-re0:
```

```
-----
MAC address information:
Public base address    00:05:85:68:98:00
Public count          2032
Private base address   00:05:85:68:9f:f0
Private count          16
```

```
lcc2-re0:
```

```
-----
MAC address information:
Public base address    00:05:85:68:78:00
Public count          2032
```

Private base address	00:05:85:68:7f:f0
Private count	16

### show chassis mac-addresses (TX Matrix Plus Router)

```
user@host> show chassis mac-addresses

sfc0-re0:
-----
MAC address information:
  Public base address  00:1d:b5:14:00:00
  Public count         65023
  Private base address 00:1d:b5:14:fd:ff
  Private count        512

lcc0-re0:
-----
MAC address information:
  Public base address  00:1f:12:7a:84:00
  Public count         2032
  Private base address 00:1f:12:7a:8b:f0
  Private count        16

lcc1-re0:
-----
MAC address information:
  Public base address  00:22:83:42:48:00
  Public count         2032
  Private base address 00:22:83:42:4f:f0
  Private count        16

lcc2-re0:
-----
MAC address information:
  Public base address  00:1f:12:c3:58:00
  Public count         2032
  Private base address 00:1f:12:c3:5f:f0
  Private count        16

lcc3-re0:
-----
MAC address information:
  Public base address  00:21:59:ef:b8:00
  Public count         2032
  Private base address 00:21:59:ef:bf:f0
  Private count        16
```

### show chassis mac-addresses (QFX Series and OCX Series )

```
user@switch> show chassis mac-addresses

MAC address information:
Public base address 02:00:08:00:00:00
Public count 512
Private base address 02:00:00:00:00:00
Private count 64
```

**show chassis mac-addresses interconnect-device (QFabric Switches)**

```
user@switch> show chassis mac-addresses interconnect-device interconnect1
```

```
MAC address information:
  Public base address    00:1f:12:30:9c:c0
  Public count           58
  Private base address   00:1f:12:30:9c:fa
  Private count          6
```

**show chassis mac-addresses node-group (QFabric Switches)**

```
user@switch> show chassis mac-addresses node-group NW-NG-0
```

```
MAC address information:
-----
RE:
  FC MAC base    00:11:00:00:00:00
  FC MAC count   2
  VLAN MAC       00:11:00:00:00:09
EC6007
  Base address   00:00:01:76:00:00
  Count          64
EC6008
  Base address   00:22:83:22:52:ae
  Count         260
```

**show chassis mac-addresses (ACX2000 Universal Metro Router)**

```
user@switch> show chassis mac-addresses
```

```
MAC address information:
  Public base address    84:18:88:c0:2b:00
  Public count           112
  Private base address   84:18:88:c0:2b:70
  Private count          16
```

**show chassis mac-addresses (ACX5048 and ACX5096 Routers)**

```
user@host> show chassis mac-addresses
```

```
FPC 0
  Base address   64:64:9b:5e:0a:00
  Count          1280
```

**show chassis mac-addresses (ACX500 Routers)**

```
user@host> show chassis mac-addresses
```

```
MAC address information:
  Public base address    f0:1c:2d:1b:60:80
  Public count           112
  Private base address   f0:1c:2d:1b:60:f0
  Private count          16
```

**show chassis mac-addresses (EX9251 Switches)**

```
user@switch> show chassis mac-addresses
```

```
MAC address information:
Public base address    4c:16:fc:90:68:00
Public count           2032
Private base address   4c:16:fc:90:6f:f0
Private count          16
```

#### show chassis mac-addresses (EX9253 Switch)

```
user@switch> show chassis mac-addresses
```

```
MAC address information:
Public base address    38:4f:49:8f:00:b8
Public count           2330
Private base address   38:4f:49:8f:09:d2
Private count          1766
```



## show chassis network-services

<b>Syntax</b>	<code>show chassis network-services</code>
<b>Release Information</b>	<p>Command introduced in Junos OS Release 9.4.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 13.2 for MX104 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 15.F5 for PTX Series Routers with third-generation FPCs.</p> <p>Command introduced in Junos OS Release 17.2 for PTX10008 Routers.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.4 for MX204 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 18.2 for MX10008 Universal Routing Platforms.</p>
<b>Description</b>	Display the network services mode that the router is configured to run in—IP Network Services mode, Ethernet Network Services mode, Enhanced IP Network Services mode, Enhanced Ethernet Network Services mode, or Enhanced mode.
<b>Options</b>	This command has no options.
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">enhanced-mode on page 639</a></li> </ul>
<b>List of Sample Output</b>	<p><a href="#">show chassis network services on page 2016</a></p> <p><a href="#">show chassis network services (MX104 Router) on page 2016</a></p> <p><a href="#">show chassis network services (MX2010 Router) on page 2016</a></p> <p><a href="#">show chassis network services (MX2020 Router) on page 2016</a></p> <p><a href="#">show chassis network services (MX2008 Router) on page 2016</a></p> <p><a href="#">show chassis network-services (MX10003 Router) on page 2016</a></p> <p><a href="#">show chassis network-services (MX204 Router) on page 2016</a></p> <p><a href="#">show chassis network-services (MX10008 Router) on page 2017</a></p> <p><a href="#">show chassis network services (PTX Router with third-generation FPCs) on page 2017</a></p>
<b>Output Fields</b>	Table 149 on page 2016 lists the output fields for the <b>show chassis network services</b> command. Output fields are listed in the approximate order in which they appear.

Table 149: show chassis network services Output Fields

Field Name	Field Description
<b>Network Services Mode</b>	<p>Network services mode configured for the router:</p> <ul style="list-style-type: none"> <li><b>IP</b>—IP Network Services mode.</li> <li><b>Ethernet</b>—Ethernet Network Services mode.</li> <li><b>enhanced-ip</b>—Enhanced IP Network Services mode</li> <li><b>enhanced-ethernet</b>—Enhanced Ethernet Network Services mode</li> <li><b>Enhanced-Mode</b>—Enhanced mode for PTX Series routers that have third-generation FPCs installed. See <a href="#">enhanced-mode</a>.</li> </ul>

## Sample Output

### show chassis network services

```
user@host> show chassis network services
Network Services Mode: IP
```

### show chassis network services (MX104 Router)

```
user@host> show chassis network services
Network Services Mode: IP
```

### show chassis network services (MX2010 Router)

```
user@host> show chassis network services
Network Services Mode: Enhanced-IP
```

### show chassis network services (MX2020 Router)

```
user@host> show chassis network services
Network Services Mode: Enhanced-IP
```

### show chassis network services (MX2008 Router)

```
user@host> show chassis network-services
Network Services Mode: Enhanced-IP
```

### show chassis network-services (MX10003 Router)

```
user@host> show chassis network-services
Network Services Mode: Enhanced-IP
```

### show chassis network-services (MX204 Router)

```
user@host> show chassis network-services
```

```
Network Services Mode: Enhanced-IP
```

#### show chassis network-services (MX10008 Router)

```
user@host> show chassis network-services
```

```
Network Services Mode: Enhanced-IP
```

#### show chassis network services (PTX Router with third-generation FPCs)

```
user@host> show chassis network services
```

```
Network Services Mode: Enhanced-Mode
```

## show chassis oss-map

<b>Syntax</b>	show chassis oss-map
<b>Release Information</b>	Command introduced in Junos OS Release 12.3R3, 13.1R2, and 13.2R1 for T4000 routers.
<b>Description</b>	(T4000 routers only) Display the operations support systems (OSS) mapping details.
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Configuring OSS Mapping to Represent a T4000 Chassis as a T1600 or a T640 Chassis on page 447</a></li><li>• <a href="#">Example: Configuring a T4000 Chassis to Represent a T640 Chassis on page 449</a></li><li>• <a href="#">oss-map on page 726</a></li></ul>
<b>Output Fields</b>	<a href="#">Table 150 on page 2018</a> lists the output fields for the <b>show chassis oss-map</b> command. Output fields are listed in the approximate order in which they appear.

*Table 150: show chassis oss-map Output Fields*

Field Name	Field Description
Chassis type	Displays the original chassis type.
Oss-map	Displays the mapped chassis type.

## Sample Output

```
user@T4000# show chassis oss-map
Chassis type      Oss-map
T4000             T640
```

## show chassis pic

<b>List of Syntax</b>	<a href="#">Syntax on page 2019</a> <a href="#">Syntax (TX Matrix and TX Matrix Plus Routers) on page 2019</a> <a href="#">Syntax (MX Series Routers and EX Series Switches) on page 2019</a> <a href="#">Syntax (MX104, MX204, MX2010, MX2020, MX10003, and MX2008 Universal Routing Platforms) on page 2019</a> <a href="#">Syntax (PTX Series Packet Transport Router and MX240, MX480, MX960, MX2010, and MX2020 Routers) on page 2019</a> <a href="#">Syntax (QFX Series) on page 2019</a> <a href="#">Syntax (OCX Series) on page 2019</a> <a href="#">Syntax (ACX Series Universal Metro Routers) on page 2020</a> <a href="#">Syntax (ACX5048 and ACX5096 Routers) on page 2020</a> <a href="#">Syntax (ACX500 Routers) on page 2020</a>
<b>Syntax</b>	<code>show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i></code>
<b>Syntax (TX Matrix and TX Matrix Plus Routers)</b>	<code>show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i> &lt;lcc <i>number</i>&gt;</code>
<b>Syntax (MX Series Routers and EX Series Switches)</b>	<code>show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i> &lt;all-members&gt; &lt;local&gt; &lt;member <i>member-id</i>&gt;</code>
<b>Syntax (MX104, MX204, MX2010, MX2020, MX10003, and MX2008 Universal Routing Platforms)</b>	<code>show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i></code>
<b>Syntax (PTX Series Packet Transport Router and MX240, MX480, MX960, MX2010, and MX2020 Routers)</b>	<code>show chassis pic transport fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i></code>
<b>Syntax (QFX Series)</b>	<code>show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i> &lt;interconnect-device <i>name</i> (fpc-slot <i>slot-number</i>   pic-slot <i>slot-number</i>)&gt; &lt;node-device <i>name</i> pic-slot <i>slot-number</i>&gt;</code>
<b>Syntax (OCX Series)</b>	<code>show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i></code>

Syntax (ACX Series Universal Metro Routers)	<code>show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i></code>
Syntax (ACX5048 and ACX5096 Routers)	<code>show chassis pic (fpc-slot <i>slot-number</i>   pic-slot <i>slot-number</i>)</code>
Syntax (ACX500 Routers)	<code>show chassis pic (fpc-slot <i>slot-number</i>   pic-slot <i>slot-number</i>)</code>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Command introduced in Junos OS Release 11.1 for QFX Series.</p> <p>Command introduced in Junos OS Release 12.2 for ACX Series Universal Metro Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 13.2 for PTX Series Packet Transport Routers.</p> <p>Command introduced in Junos OS Release 13.2 for MX104 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> <p><b>transport</b> option introduced in Junos OS Release 16.1R1 for MX Series Routers.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.2 for PTX10008 Routers.</p> <p>Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.3 for MX150 Router Appliance.</p> <p>Command introduced in Junos OS Release 17.4 for MX204 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 18.1R1 for EX9251 switches.</p> <p>Command introduced in Junos OS Release 18.2 for EX9253 Switches.</p>
Description	Display status information about the PIC installed in the specified Flexible PIC Concentrator (FPC) and PIC slot.
Options	<p><b>fpc-slot <i>slot-number</i></b>—Display information about the PIC in this particular FPC slot:</p> <ul style="list-style-type: none"> <li>On a TX Matrix router, if you specify the number of the T640 router by using the <b>lcc <i>number</i></b> option (the recommended method), replace <b><i>slot-number</i></b> with a value from 0 through 7. Otherwise, replace <b><i>slot-number</i></b> with a value from 0 through 31.</li> </ul> <p>Likewise, on a TX Matrix Plus router, if you specify the number of the T1600 router by using the <b>lcc <i>number</i></b> option (the recommended method), replace <b><i>slot-number</i></b> with a value from 0 through 7. Otherwise, replace <b><i>slot-number</i></b> with a value from 0 through 31. For example, the following commands have the same result:</p> <pre> user@host&gt; show chassis pic fpc-slot 1 lcc 1 pic-slot 1 user@host&gt; show chassis pic fpc-slot 9 pic-slot 1 </pre> <ul style="list-style-type: none"> <li>M120 routers only—Replace <b><i>slot-number</i></b> with a value from 0 through 5.</li> </ul>

- MX80 routers only—Replace **slot-number** with a value from 0 through 1.
- MX104 routers only—Replace **slot-number** with a value from 0 through 2.
- MX240 routers only—Replace **slot-number** with a value from 0 through 2.
- MX480 routers only—Replace **slot-number** with a value from 0 through 5.
- MX960 routers only—Replace **slot-number** with a value from 0 through 11.
- MX2010 routers only—Replace **slot-number** with a value from 0 through 9.
- MX2020 routers only—Replace **slot-number** with a value from 0 through 19.
- MX2008 routers only—Replace **slot-number** with a value from 0 through 9.
- MX10003 routers only—Replace **slot-number** with a value from 0 through 1.
- Other routers—Replace **slot-number** with a value from 0 through 7.
- EX Series switches:
  - EX3200 switches and EX4200 standalone switches—Replace **slot-number** with 0.
  - EX4200 switches in a Virtual Chassis configuration—Replace **slot-number** with a value from 0 through 9 (switch's member ID).
  - EX8208 switches—Replace **slot-number** with a value from 0 through 7 (line card).
  - EX8216 switches—Replace **slot-number** with a value from 0 through 15 (line card).
- QFX Series:
  - QFX3500, QFX3600, QFX5100, and OCX Series standalone switches—Replace **slot-number** with 0. In the command output, FPC refers to a line card. The FPC number equals the slot number for the line card.
  - QFabric systems—Replace **slot-number** with any number between 0 and 15. In the command output, FPC refers to a line card. The FPC number equals the slot number for the line card.

**all-members**—(MX Series routers and EX Series switches only) (Optional) Display PIC information for all member routers in the Virtual Chassis configuration.

**interconnect-device name**—(QFabric systems only) (Optional) Display PIC information for a specified Interconnect device.

**lcc number**—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display PIC information for a specified T640 router (or line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display PIC information for a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers and EX Series switches only) (Optional) Display PIC information for the local Virtual Chassis member.

**member *member-id***—(MX Series routers and EX Series switches only) (Optional) Display PIC information for the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

**node-device *name***—(QFabric systems only) (Optional) Display PIC information for a specified Node device.

**pic-slot *slot-number***—Display information about the PIC in this particular PIC slot. For routers, replace *slot-number* with a value from 0 through 3. For EX3200 and EX4200 switches, replace *slot-number* with 0 for built-in network interfaces and 1 for interfaces on uplink modules. For EX8208 and EX8216 switches, replace *slot-number* with 0. For the QFX3500 standalone switch and the QFabric system, replace *slot-number* with 0 or 1.

**transport**—Display PIC information for optical transport network.

**Required Privilege Level**

view

**Related Documentation**

- [request chassis pic on page 876](#)
- [show chassis hardware on page 1726](#)
- [100-Gigabit Ethernet Type 4 PIC with CFP Overview](#)

**List of Sample Output**

[show chassis pic fpc-slot pic-slot on page 2026](#)  
[show chassis pic fpc-slot pic-slot \(PIC Offline\) on page 2026](#)  
[show chassis pic fpc-slot pic-slot \(FPC Offline\) on page 2026](#)  
[show chassis pic fpc-slot pic-slot \(FPC Not Present\) on page 2026](#)  
[show chassis pic fpc-slot pic-slot \(PIC Not Present\) on page 2027](#)  
[show chassis pic fpc-slot 3 pic-slot 0 \(M120 Router\) on page 2027](#)  
[show chassis pic fpc-slot pic-slot \(MX150\) on page 2027](#)  
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[show chassis pic fpc-slot pic-slot \(MX960 Router with Bidirectional Optics\) on page 2028](#)  
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[show chassis pic fpc-slot 0 pic-slot 0 \(EX9251 Switches\) on page 2045](#)

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**Output Fields** [Table 151 on page 2024](#) lists the output fields for the **show chassis pic** command. Output fields are listed in the approximate order in which they appear.

*Table 151: show chassis pic Output Fields*

Field Name	Field Description
Type	<p>PIC type.</p> <p><b>NOTE:</b> On the 1-port OC192/STM64 MICs with the SDH framing mode, the type is displayed as <b>MIC-3D-1STM64-XFP</b> and with the SONET framing mode, the type is displayed as <b>MIC-3D-1OC192-XFP</b>. By default, the 1-port OC192/STM64 MICs displays the type as <b>MIC-3D-1OC192-XFP</b>.</p>
Account Layer2 Overhead	(MX Series routers) Indicates whether functionality to count the Layer 2 overhead bytes in the interface statistics at the PIC level is enabled or disabled.
ASIC type	Type of ASIC on the PIC.
State	<p>Status of the PIC. State is displayed only when a PIC is in the slot.</p> <ul style="list-style-type: none"> <li>• <b>Online</b>— PIC is online and running.</li> <li>• <b>Offline</b>—PIC is powered down.</li> </ul>
PIC version	PIC hardware version.
Uptime	How long the PIC has been online.
Package	(Multiservices PICs only) Services package supported: <b>Layer-2</b> or <b>Layer-3</b> .
Port Number	Port number for the PIC.
Cable Type	Type of cable connected to the port: <b>LH</b> , <b>LX</b> , or <b>SX</b> .

Table 151: show chassis pic Output Fields (continued)

Field Name	Field Description
<b>PIC Port Information (MX480 Router 100-Gigabit Ethernet CFP)</b>	<p>Port-level information for the PIC.</p> <ul style="list-style-type: none"> <li>• Port—Port number</li> <li>• Cable type—Type of optical transceiver installed.</li> <li>• Fiber type—Type of fiber. SM is single-mode.</li> <li>• Xcvr vendor—Transceiver vendor name.</li> <li>• Xcvr vendor part number—Transceiver vendor part number.</li> <li>• Wavelength—Wavelength of the transmitted signal. Uplinks and downlinks are always 1550 nm. There is a separate fiber for each direction</li> <li>• Xcvr Firmware—Transceiver firmware version.</li> </ul>
<b>PIC Port Information (MX960 Router Bidirectional Optics )</b>	<p>Port-level information for the PIC.</p> <ul style="list-style-type: none"> <li>• Port—Port number</li> <li>• Cable type—Type of small form-factor pluggable (SFP) optical transceiver installed. Uplink interfaces display -U. Down link interfaces display -D.</li> <li>• Fiber type—Type of fiber. SM is single-mode.</li> <li>• Xcvr vendor—Transceiver vendor name.</li> <li>• Xcvr vendor part number—Transceiver vendor part number. <ul style="list-style-type: none"> <li>• BX10-10-km bidirectional optics.</li> <li>• BX40-40-km bidirectional optics.</li> <li>• SFP-LX-40-km SFP optics.</li> </ul> </li> <li>• Wavelength—Wavelength of the transmitted signal. Uplinks are always 1310 nm. Downlinks are either 1490 nm or 1550 nm.</li> </ul>
<b>PIC Port Information (Next-Generation SONET/SDH SFP)</b>	<p>Port-level information for the next-generation SONET/SDH SFP PIC.</p> <ul style="list-style-type: none"> <li>• Port—Port number.</li> <li>• Cable type—Type of small form-factor pluggable (SFP) optical transceiver installed.</li> <li>• Fiber type—Type of fiber: <b>SM</b> (single-mode) or <b>MM</b> (multimode).</li> <li>• Xcvr vendor—Transceiver vendor name.</li> <li>• Xcvr vendor part number—Transceiver vendor part number.</li> <li>• Wavelength—Wavelength of the transmitted signal. Next-generation SONET/SDH SFPs use 1310 nm.</li> </ul>
<b>PIC port information (MX104 router)</b>	<p>Port-level information for the PIC.</p> <ul style="list-style-type: none"> <li>• Port—Port number</li> <li>• Cable type—Type of optical transceiver installed.</li> <li>• Fiber type—Type of fiber. SM is single-mode.</li> <li>• Xcvr vendor—Transceiver vendor name.</li> <li>• Xcvr vendor part number—Transceiver vendor part number.</li> <li>• Wavelength—Wavelength of the transmitted signal.</li> <li>• Xcvr Firmware—Firmware version of the transceiver.</li> </ul>

Table 151: show chassis pic Output Fields (continued)

Field Name	Field Description
Port speed information	Information pertaining to port speed: <ul style="list-style-type: none"> <li>• Port—Port number.</li> <li>• PFE—Packet Forwarding Engine slot number.</li> <li>• Capable Port Speed—Speed supported by each port.</li> </ul>
Multirate Mode	Rate-selectability status for the MIC: <b>Enabled</b> or <b>Disabled</b> .
Channelization	Indicates whether channelization is enabled or disabled on the DS3/E3 MIC.
Administrative State	Indicates the administrative state of the PIC. Possible values are: In Service (Default) and Out of Service.
Operational State	Indicates the operational state of the PIC. Possible values are: Normal and Fault.

## Sample Output

### show chassis pic fpc-slot pic-slot

```

user@host> show chassis pic fpc-slot 2 pic-slot 0
PIC fpc slot 2 pic slot 0 information:
  Type                10x 1GE(LAN), 1000 BASE
  ASIC type           H chip
  State               Online
  PIC version         1.1
  Uptime              1 day, 50 minutes, 58 seconds
PIC Port Information:
  Port      Cable      Xcvr      Xcvr Vendor
  Number    Type        Vendor Name  Part Number
  0         GIGE 1000EX  FINISAR CORP.  FTRJ8519P1BNL-J3
  1         GIGE 1000EX  FINISAR CORP.  FTRJ-8519-7D-JUN

```

### show chassis pic fpc-slot pic-slot (PIC Offline)

```

user@host> show chassis pic fpc-slot 1 pic-slot 0
PIC fpc slot 1 pic slot 0 information:
  State              Offline

```

### show chassis pic fpc-slot pic-slot (FPC Offline)

```

user@host> show chassis pic fpc-slot 1 pic-slot 0
FPC 1 is not online

```

### show chassis pic fpc-slot pic-slot (FPC Not Present)

```

user@host> show chassis pic fpc-slot 4 pic-slot 0

```

```
FPC slot 4 is empty
```

#### show chassis pic fpc-slot pic-slot (PIC Not Present)

```
user@host> show chassis pic fpc-slot 5 pic-slot 2
```

```
FPC 5, PIC 2 is empty
```

#### show chassis pic fpc-slot 3 pic-slot 0 (M120 Router)

```
user@host> show chassis pic fpc-slot 3 pic-slot 0
```

```
PC slot 3, PIC slot 0 information:
```

```
Type                2x G/E IQ, 1000 BASE
ASIC type            IQ GE 2 VLAN-TAG FPGA
State                Online
PIC version          1.16
Uptime               3 hours, 3 minutes
```

```
PIC Port Information:
```

Port Number	Cable Type	Xcvr Vendor Name	Xcvr Vendor Part Number
0	GIGE 1000SX	FINISAR CORP.	FTRJ8519P1BNL-J3
1	GIGE 1000SX	FINISAR CORP.	FTRJ-8519-7D-JUN

#### show chassis pic fpc-slot pic-slot (MX150)

```
user@host> show chassis pic fpc-slot 0 pic-slot 0
```

```
FPC slot 0, PIC slot 0 information:
```

```
Type                Virtual
State                Online
PIC version          0.0
Uptime               7 days, 19 hours, 44 minutes, 40 seconds
```

```
PIC port information:
```

Port	Cable type	Fiber type	Xcvr vendor	Xcvr vendor part number	Wave-length	Xcvr
10	GIGE 1000T	n/a	Methode Elec.	SP7041-M1-JN	n/a	0.0
11	GIGE 1000T	n/a	Methode Elec.	SP7041-M1-JN	n/a	0.0

#### show chassis pic fpc-slot pic-slot (MX104 Router)

```
user@host> show chassis pic fpc-slot 1 pic-slot 1
```

```
FPC slot 1, PIC slot 1 information:
```

```
Type                10x 1GE(LAN) -E SFP
State                Online
PIC version          1.1
Uptime               1 hour, 30 minutes, 59 seconds
```

```
PIC port information:
```

Port	Cable type	Fiber type	Xcvr vendor	Xcvr vendor part number	Wave-length	Xcvr
------	------------	------------	-------------	-------------------------	-------------	------

Firmware							
3	GIGE 1000T	n/a	Methode Elec.	SP7041-M1-JN	n/a	0.0	
6	GIGE 1000LX10	SM	FINISAR CORP.	FTLF1318P2BTL-J1	1310 nm	0.0	
8	GIGE 1000T	n/a	Methode Elec.	SP7041-M1-JN	n/a	0.0	
9	GIGE 1000T	n/a	Methode Elec.	SP7041-M1-JN	n/a	0.0	

### show chassis pic fpc-slot pic-slot (MX960 Router with Bidirectional Optics)

```

user@host> show chassis pic fpc-slot 4 pic-slot 1

FPC slot 4, PIC slot 1 information:
  Type                10x 1GE(LAN)
  Account Layer2 Overhead  Enabled
  State                Online
  PIC version          0.0
  Uptime               18 days, 5 hours, 41 minutes, 54 seconds

PIC port information:

```

Port	Cable type	Fiber type	Xcvr vendor	Xcvr vendor part number	Wavelength
0	SFP-1000BASE-BX10-D	SM	SumitomoElectric	SBP6H44-J3-BW-49	1490 nm
1	SFP-1000BASE-BX10-D	SM	SumitomoElectric	SBP6H44-J3-BW-49	1490 nm
2	SFP-1000BASE-BX10-D	SM	SumitomoElectric	SBP6H44-J3-BW-49	1490 nm
3	SFP-1000BASE-BX10-D	SM	OCF	TRXBG1LXDBVM2-JW	1490 nm
4	SFP-1000BASE-BX10-D	SM	OCF	TRXBG1LXDBVM2-JW	1490 nm
5	SFP-1000BASE-BX10-U	SM	SumitomoElectric	SBP6H44-J3-BW-31	1310 nm
6	SFP-1000BASE-BX10-U	SM	SumitomoElectric	SBP6H44-J3-BW-31	1310 nm
7	SFP-1000BASE-BX10-U	SM	OCF	TRXBG1LXDBBMH-J1	1310 nm
8	SFP-1000BASE-BX10-U	SM	OCF	TRXBG1LXDBBMH-J1	1310 nm
9	SFP-1000BASE-BX10-U	SM	SumitomoElectric	SBP6H44-J3-BW-31	1310 nm

### show chassis pic fpc-slot pic-slot (MX480 Router with 100-Gigabit Ethernet MIC)

```

user@host> show chassis pic fpc-slot 1 pic-slot 2

FPC slot 1, PIC slot 2 information:
  Type                1X100GE CFP
  State                Online
  PIC version          2.10
  Uptime               4 minutes, 48 seconds

PIC port information:

```

Port	Cable type	Fiber type	Xcvr vendor	Xcvr vendor part number	Wavelength
0	100GBASE LR4	SM	FINISAR CORP.	FTLC1181RDN5-J3	1310 nm

```

  Xcvr vendor
  firmware version
  1.8

```

### show chassis pic fpc-slot pic-slot (MX240, MX480, MX960 Routers with Application Services Modular Line Card)

```

user@host>show chassis pic fpc-slot 1 pic-slot 2

```

```
FPC slot 1, PIC slot 2 information:
Type          AS-MXC
State          Online
PIC version    1.0
Uptime        11 hours, 18 minutes, 3 seconds
```

### show chassis pic fpc-slot pic-slot (MX960 Router with MPC5EQ)

```
user@host> show chassis pic fpc-slot 0 pic-slot 3
FPC slot 0, PIC slot 3 information:
Type          1X100GE CFP2 OTN
State          Online
PIC version    0.0
Uptime        1 hour, 22 minutes, 42 seconds

PIC port information:
Fiber          Xcvr vendor      Wave-      Xcvr
Port Cable type type Xcvr vendor      part number length
Firmware
0 100GBASE LR4 n/a Oclaro Inc.      TRB5E20FNF-LF150 1309 nm 1.0
```

### show chassis pic fpc-slot pic-slot (MX960 Router with MPC3E and 100-Gigabit DWDM OTN MIC)

```
user@host> show chassis pic fpc-slot 3 pic-slot 0
FPC slot 3, PIC slot 0 information:
Type          1X100GE DWDM CFP2-ACO
State          Online
PIC version    1.3
Uptime        9 hours, 4 minutes, 43 seconds

PIC port information:
Fiber          Xcvr vendor      Wave-      Xcvr
Port Cable type type Xcvr vendor      part number length
Firmware
0 100G LH      SM OCLARO          TRB100AJ-01      1528.77 nm -
1568.36 nm 20.10
```

### show chassis pic fpc-slot pic-slot

```
user@host> show chassis pic fpc-slot 1 pic-slot 1
FPC slot 1, PIC slot 1 information:
Type          MIC1-MACSEC
State          Online
PIC version    1.5
Uptime        2 hours, 52 minutes, 1 second

PIC port information:
Fiber          Xcvr vendor      Wave-      Xcvr
Port Cable type type Xcvr vendor      part number length
Firmware
8 40GBASE SR4  MM AVAGO          AFBR-79EQDZ-JU2  850 nm 0.0
```

10	40GBASE SR4	MM	AVAGO	AFBR-79EQDZ-JU2	850 nm	0.0
----	-------------	----	-------	-----------------	--------	-----

Port speed information:

Port	PFE	Capable	Port Speeds
0	0	4x10GE, 40GE, 100GE	
1	0	4x10GE, 40GE, 100GE	
2	0	4x10GE, 40GE, 100GE	
3	0	4x10GE, 40GE, 100GE	
4	0	4x10GE, 40GE, 100GE	
5	0	4x10GE, 40GE, 100GE	
6	0	4x10GE, 40GE, 100GE	
7	0	4x10GE, 40GE, 100GE	
8	0	4x10GE, 40GE, 100GE	
9	0	4x10GE, 40GE, 100GE	
10	0	4x10GE, 40GE, 100GE	
11	0	4x10GE, 40GE, 100GE	

### show chassis pic fpc-slot pic-slot (MX10003 Routers)

```
user@host > show chassis pic fpc-slot 0 pic-slot 0
```

FPC slot 0, PIC slot 1 information:

Type	MIC1
State	Online
PIC version	1.5
Uptime	13 hours, 54 minutes, 33 seconds

PIC port information:

		Fiber		Xcvr vendor	Wave-	Xcvr
Port	Cable type	type	Xcvr vendor	part number	length	
0	40GBASE SR4	MM	AVAGO	AFBR-79EQDZ-JU2	850 nm	0.0
11	40GBASE SR4	MM	AVAGO	AFBR-79EQDZ-JU2	850 nm	0.0

Port speed information:

Port	PFE	Capable	Port Speeds
0	0	4x10GE, 40GE, 100GE	
1	0	4x10GE, 40GE, 100GE	
2	0	4x10GE, 40GE, 100GE	
3	0	4x10GE, 40GE, 100GE	
4	1	4x10GE, 40GE, 100GE	
5	1	4x10GE, 40GE, 100GE	
6	1	4x10GE, 40GE, 100GE	
7	1	4x10GE, 40GE, 100GE	
8	2	4x10GE, 40GE, 100GE	
9	2	4x10GE, 40GE, 100GE	
10	2	4x10GE, 40GE, 100GE	
11	2	4x10GE, 40GE, 100GE	

### show chassis pic fpc-slot pic-slot (MX204 Routers)

```
user@host > show chassis pic fpc-slot 0 pic-slot 0
```



FPC slot 0, PIC slot 0 information:

```

Type          4XQSFP28 PIC
State         Online
PIC version   0.0
Uptime        2 days, 7 hours, 6 minutes, 10 seconds

```

PIC port information:

JNPR		Fiber	Xcvr vendor	Wave-	Xcvr
Port	Cable type	type	Xcvr vendor	part number	length
0	100GBASE SR4 REV 01	MM	JUNIPER-FINISAR	FTLC9551REPM-J1	850 nm 0.0
1	4X10GBASE SR REV 01	MM	AVAGO	AFBR-79EEPZ-JU2	850 nm 0.0
2	100GBASE LR4 REV 01	SM	JUNIPER-FINISAR	FTLC1151RDPL-J3	1302 nm 0.0
3	100GBASE LR4 REV 01	SM	JUNIPER-FINISAR	FTLC1151RDPL-J3	1302 nm 0.0

Port speed information:

Port	PFE	Capable Port Speeds
0	0	4x10GE, 40GE, 100GE
1	0	4x10GE, 40GE, 100GE
2	0	4x10GE, 40GE, 100GE
3	0	4x10GE, 40GE, 100GE

### show chassis pic fpc-slot pic-slot (PTX3000 Router with 5-port 100-Gigabit DWDM OTN PIC)

user@host > show chassis pic fpc-slot 4 pic-slot 0

FPC slot 4, PIC slot 0 information:

```

Type          5X100GE DWDM CFP2-ACO
State         Online
PIC version   1.17
Uptime        1 day, 5 hours, 15 minutes, 17 seconds

```

PIC port information:

JNPR		Fiber	Xcvr vendor	Wave-	Xcvr
Port	Cable type	type	Xcvr vendor	part number	length
0	100G LH 1568.36 nm 1.0	SM	MULTILANE SAL	ML4030-ACO-2	1528.77 nm -
1	100G LH 1568.36 nm 1.0	SM	MULTILANE SAL	ML4030-ACO-2	1528.77 nm -
2	100G LH 1568.36 nm 1.16	SM	JUNIPER-FUJITSU	FIM38500/222	1528.77 nm -
3	100G LH 1568.36 nm 1.16	SM	FUJITSU	FIM38500/222	1528.77 nm -
4	100G LH 1568.36 nm 1.16	SM	FUJITSU	FIM38500/222	1528.77 nm -

### show chassis pic fpc-slot pic-slot (MX480 Router with MPC4E)

user@host> show chassis pic fpc-slot 3 pic-slot 0

FPC slot 3, PIC slot 0 information:

```
Type          4x10GE SFPP
State          Online
PIC version    0.0
Uptime        41 seconds
```

PIC port information:

		Fiber		Xcvr vendor	Wave-	Xcvr
Port	Cable type	type	Xcvr vendor	part number	length	
0	10GBASE SR	MM	OPNEXT, INC.	TRS2001EM-0014	850 nm	0.0
1	10GBASE SR	MM	OPNEXT, INC.	TRS2001EM-0014	850 nm	0.0

### show chassis pic fpc-slot pic-slot (MX480 router with OTN Interface)

user@host> show chassis pci fpc-slot 4 pic-slot 0

FPC slot 4, PIC slot 0 information:

```
Type          12X10GE SFPP OTN
State          Online
PIC version    0.0
Uptime        5 hours, 28 minutes, 23 seconds
```

PIC port information:

		Fiber		Xcvr vendor	Wave-	Xcvr
Port	Cable type	type	Xcvr vendor	part number	length	
0	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BNL-J1	850 nm	0.0
1	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
2	10GBASE SR	MM	OPNEXT, INC.	TRS2001EM-0014	850 nm	0.0

### show chassis pic fpc-slot pic-slot (MX2010 Router with OTN Interfaces)

user@host> show chassis pic fpc-slot 9 pic-slot 0

FPC slot 9, PIC slot 0 information:

```
Type          2X100GE CFP2 OTN
State          Online
PIC version    1.9
Uptime        3 hours, 56 minutes, 16 seconds
```

PIC port information:

		Fiber		Xcvr vendor	Wave-	Xcvr
Port	Cable type	type	Xcvr vendor	part number	length	
0	100GBASE LR4-D	SM	FUJITSU	FIM37300/222	1310 nm	1.3
1	100GBASE SR10	MM	AVAGO	AFBR-8420Z	n/a	1.0

**show chassis pic fpc-slot pic-slot (MX2010 Router)**

```
user@host> show chassis pic fpc-slot 9 pic-slot 3
```

```
FPC slot 9, PIC slot 3 information:
```

```
Type                1X100GE CFP
Account Layer2 Overhead Enabled
State                Online
PIC version          0.0
Uptime               14 hours, 51 seconds
```

**show chassis pic fpc-slot pic-slot (MX2020 Router)**

```
user@host> show chassis pic fpc-slot 19 pic-slot 3
```

```
FPC slot 19, PIC slot 3 information:
```

```
Type                4x 10GE(LAN) SFP+
Account Layer2 Overhead Enabled
State                Online
PIC version          0.0
Uptime               1 day, 11 hours, 26 minutes, 36 seconds
```

```
PIC port information:
```

			Fiber		Xcvr vendor	Wave-	Xcvr
	Port	Cable type	type	Xcvr vendor	part number	length	
Firmware	0	10GBASE SR	MM	SumitomoElectric	SPP5200SR-J6-M	850 nm	0.0
	1	10GBASE SR	MM	SumitomoElectric	SPP5200SR-J6-M	850 nm	0.0
	2	10GBASE SR	MM	SumitomoElectric	SPP5200SR-J6-M	850 nm	0.0
	3	10GBASE SR	MM	SumitomoElectric	SPP5200SR-J6-M	850 nm	0.0

**show chassis pic fpc-slot pic-slot (MX2020 Router with MPC5EQ and MPC6E)**

```
user@host> show chassis pic fpc-slot 18 pic-slot 2
```

```
FPC slot 18, PIC slot 2 information:
```

```
Type                3X40GE QSFP
State                Online
PIC version          0.0
Uptime               6 minutes, 31 seconds
```

```
PIC port information:
```

			Fiber		Xcvr vendor	Wave-	Xcvr
	Port	Cable type	type	Xcvr vendor	part number	length	
Firmware	0	40GBASE SR4	MM	AVAGO	AFBR-79E4Z-D-JU2	850 nm	0.0
	1	40GBASE SR4	MM	AVAGO	AFBR-79E4Z-D-JU2	850 nm	0.0
	2	40GBASE SR4	MM	AVAGO	AFBR-79E4Z-D-JU2	850 nm	0.0

**show chassis pic fpc-slot pic-slot (MX2020 Router with MPC6E and OTN MIC)**

```
user@host> show chassis pic fpc-slot 3 pic-slot 0
```

```
FPC slot 0, PIC slot 1 information:
```

```
Type                24X10GE SFPP OTN
State                Online
PIC version          1.1
Uptime               1 hour, 33 minutes, 59 seconds
```

```
PIC port information:
```

			Fiber		Xcvr vendor	Wave-	Xcvr
Port	Cable type		type	Xcvr vendor	part number	length	
Firmware							
7	10GBASE SR		MM	SumitomoElectric	SPP5200SR-J6-M	850 nm	0.0
9	10GBASE SR		MM	FINISAR CORP.	FTLX8571D3BNL-J1	850 nm	0.0
12	10GBASE LR		SM	FINISAR CORP.	FTLX1472M3BNL-J3	1310 nm	0.0
20	10GBASE ZR		SM	FINISAR CORP.	FTLX1871M3BNL-J3	1550 nm	0.0
21	10GBASE ER		SM	FINISAR CORP.	FTLX1671D3BTL-J4	1550 nm	0.0
22	10GBASE LR		SM	SOURCEPHOTONICS	SPP10SLREDFCJNP	1310 nm	0.0
23	10GBASE LR		SM	FINISAR CORP.	FTLX1471D3BNL-J1	1310 nm	0.0

**show chassis pic fpc-slot pic-slot (MX2020 Router with MPC4E)**

```
user@host> show chassis pic fpc-slot 14 pic-slot 0
```

```
FPC slot 14, PIC slot 2 information:
```

```
Type                4x10GE SFPP
State                Online
PIC version          0.0
Uptime               1 day, 14 hours, 49 minutes, 9 seconds
```

```
PIC port information:
```

			Fiber		Xcvr vendor	Wave-	Xcvr
Port	Cable type		type	Xcvr vendor	part number	length	
Firmware							
0	10GBASE SR		MM	SumitomoElectric	SPP5100SR-J3	850 nm	0.0
1	10GBASE SR		MM	SumitomoElectric	SPP5100SR-J3	850 nm	0.0
3	10GBASE SR		MM	SumitomoElectric	SPP5100SR-J3	850 nm	0.0

**show chassis pic fpc-slot pic-slot (MX2010 Router)**

```
user@host> show chassis pic fpc-slot 9 pic-slot 3
```

```
FPC slot 9, PIC slot 3 information:
```

```
Type                1X100GE CFP
Account Layer2 Overhead Enabled
State                Online
```

PIC version	0.0
Uptime	14 hours, 51 seconds

### show chassis pic fpc-slot pic-slot (T1600 Router with 100-Gigabit Ethernet PIC)

```
user@host> run show chassis pic fpc-slot 3 pic-slot 1
```

FPC slot 3, PIC slot 1 information:

Type	100GE SLOT1
ASIC type	Brooklyn 100GE FPGA
State	Online
PIC version	1.3
Uptime	10 minutes, 44 seconds

PIC port information:

Port	Cable type	Fiber type	Xcvr vendor	Xcvr vendor part number	Wavelength
0	10GBASE LR4	SM	Opnext Inc.	TRC5E20ENFSF000F	1310 nm

### show chassis pic fpc-slot pic-slot lcc (TX Matrix Router)

```
user@host> show chassis pic fpc-slot 1 pic-slot 1 lcc 0
```

lcc0-re0:

PIC fpc slot 1 pic slot 1 information:

Type	4x OC-3 SONET, SMIR
ASIC type	D chip
State	Online
PIC version	1.2
Uptime	5 days, 2 hours, 12 minutes, 8 seconds

### show chassis pic fpc-slot pic-slot lcc (TX Matrix Plus Router)

```
user@host> show chassis pic pic-slot 0 fpc-slot 8
```

lcc0-re0:

FPC slot 8, PIC slot 0 information:

Type	1x 10GE(LAN/WAN)
State	Online
Uptime	2 hours, 46 minutes, 23 seconds

PIC port information:

Port	Cable type	Fiber type	Xcvr vendor	part number	Wavelength
0	10GBASE ZR	SM	Opnext Inc.	TRF7061BN-LF150	1550 nm
0	10GBASE ZR	SM	FINISAR CORP.	FTRX-1811-3-J2	1550 nm

### show chassis pic fpc-slot pic-slot (Next-Generation SONET/SDH SFP)

```
user@host> show chassis pic fpc-slot 4 pic-slot 0
```

FPC slot 4, PIC slot 0 information:

Type	4x OC-3 1x OC-12 SFP
ASIC type	D FPGA
State	Online
PIC version	1.3

Uptime			1 day, 50 minutes, 4 seconds			
PIC port information:						
Port	Cable type	Fiber type	Xcvr vendor	Xcvr vendor part number	Wavelength	
0	OC48 short reach	SM	FINISAR CORP.	FTRJ1321P1BTL-J2	1310 nm	
1	OC3 short reach	MM	OCF	TRPA03MM3BAS-JE	1310 nm	
2	OC3 short reach	MM	OCF	TRXA03MM3BAS-JW	1310 nm	
3	OC12 inter reach	SM	FINISAR CORP.	FTLF1322P1BTR	1310 nm	

### show chassis pic fpc-slot pic-slot (12-Port T1/E1)

```
user@host> show chassis pic fpc-slot 0 pic-slot 3
```

```
FPC slot 0, PIC slot 3 information:
Type                12x T1/E1 CE
State                Online
PIC version          1.1
CPU load average     1 percent
Interrupt load average 0 percent
Total DRAM size      128 MB
Memory buffer utilization 100 percent
Memory heap utilization 4 percent
Uptime               1 day, 22 hours, 28 minutes, 12 seconds
Internal Clock Synchronization Normal
```

### show chassis pic fpc-slot 0 pic-slot 1 (4x CHOC3 SONET CE SFP)

```
user@host> show chassis pic fpc-slot 0 pic-slot 1
```

```
FPC slot 0, PIC slot 1 information:
Type                4x CHOC3 SONET CE SFP
State                Online
PIC version          1.3
CPU load average     1 percent
Interrupt load average 0 percent
Total DRAM size      128 MB
Memory buffer utilization 99 percent
Memory heap utilization 4 percent
Uptime               1 day, 22 hours, 55 minutes, 37 seconds
Internal Clock Synchronization Normal
```

PIC port information:						
Port	Cable type	Fiber type	Xcvr vendor	Xcvr vendor part number	Wavelength	
0	OC3 short reach	MM	AVAGO	HFBR-57E0P-JU2	n/a	
1	OC3 short reach	MM	AVAGO	HFBR-57E0P-JU2	n/a	
3	OC3 long reach	SM	OPNEX INC	TRF5456AVLB314	1310 nm	

### show chassis pic fpc-slot 0 pic-slot 0 (SONET/SDH OC3/STM1 [Multi-Rate] MIC with SFP)

```
user@host> show chassis pic fpc-slot 0 pic-slot 0
```

```
FPC slot 0, PIC slot 0 information:
Type                MIC-3D-80C30C12-40C48
State                Online
PIC version          1.8
Uptime               3 days, 22 hours, 3 minutes, 50 seconds
```

## PIC port information:

Port	Cable type	Fiber type	Xcvr vendor	Xcvr vendor part number	Wavelength
1	OC12 inter reach	SM	FINISAR CORP	FTRJ1322P1BTR-J3	1310 nm
7	OC12 inter reach	SM	FINISAR CORP	FTRJ1322P1BTR-J3	1310 nm

Multirate Mode Enabled

**show chassis pic fpc-slot 3 pic-slot 0 (8-port Channelized SONET/SDH OC3/STM1 [Multi-Rate] MIC with SFP)**

```
user@host> show chassis pic fpc-slot 3 pic-slot 0
```

## FPC slot 3, PIC slot 0 information:

Type	MIC-3D-8CHOC3-4CHOC12
State	Online
PIC version	1.9
Uptime	1 hour, 21 minutes, 24 seconds

## PIC port information:

Port	Cable type	Fiber type	Xcvr vendor	Xcvr vendor part number	Wavelength
0	OC12 short reach	SM	FINISAR CORP.	FTRJ1322P1BTR-J3	1310 nm
1	OC12 short reach	SM	FINISAR CORP.	FTRJ1322P1BTR-J3	1310 nm
2	OC12 inter reach	SM	FINISAR CORP.	FTRJ1322P1BTR-J2	1310 nm
4	OC12 short reach	SM	FINISAR CORP.	FTRJ1322P1BTR-J3	1310 nm
5	OC12 short reach	SM	FINISAR CORP.	FTRJ1322P1BTR-J3	1310 nm
6	OC12 short reach	SM	FINISAR CORP.	FTRJ1322P1BTR-J3	1310 nm
7	OC12 short reach	SM	FINISAR CORP.	FTRJ1322P1BTR-J3	1310 nm

**show chassis pic fpc-slot 5 pic-slot 0 (4-port Channelized SONET/SDH OC3/STM1 [Multi-Rate] MIC with SFP)**

```
user@host> show chassis pic fpc-slot 5 pic-slot 0
```

## FPC slot 5, PIC slot 0 information:

Type	MIC-3D-4CHOC3-2CHOC12
State	Online
PIC version	1.9
Uptime	1 hour, 21 minutes

## PIC port information:

Port	Cable type	Fiber type	Xcvr vendor	Xcvr vendor part number	Wavelength
1	OC12 inter reach	SM	FINISAR CORP.	FTRJ1322P1BTR-J3	1310 nm
2	OC12 inter reach	SM	FINISAR CORP.	FTRJ1322P1BTR-J3	1310 nm
3	OC12 short reach	SM	FINISAR CORP.	FTRJ1322P1BTR-J3	1310 nm

**show chassis pic fpc-slot 1 pic-slot 0 (1-port OC192/STM64 MIC with XFP)**

```
user@host> show chassis pic fpc-slot 1 pic-slot 0
```

## FPC slot 1, PIC slot 0 information:

Type	MIC-3D-10C192-XFP
State	Online
PIC version	1.2
Uptime	1 day, 11 hours, 4 minutes, 6 seconds

## PIC port information:

Fiber	Xcvr vendor
-------	-------------

Port	Cable type	type	Xcvr vendor	part number	Wavelength
0	OC192 short reach	n/a	FINISAR CORP.	FTLX1412M3BCL-J3	1310 nm

### show chassis pic fpc-slot 1 pic-slot 2 (8-port DS3/E3 MIC)

```
user@host> show chassis pic fpc-slot 1 pic-slot 2
FPC slot 1, PIC slot 2 information:
  Type                MIC-3D-8DS3-E3
  State               Online
  PIC version         1.10
  Uptime              4 days, 1 hour, 29 minutes, 19 seconds
  Channelization Mode Disabled
```

### show chassis pic fpc-slot pic-slot (OTN)

```
user@host> show chassis pic fpc-slot 5 pic-slot 0
PIC fpc slot 5 pic slot 0 information:
  Type                1x10GE(LAN),OTN
  ASIC type           H chip
  State              Online
  PIC version         1.0
  Uptime             5 minutes, 50 seconds
```

### show chassis pic fpc-slot pic-slot (QFX3500 Switch)

```
user@switch> show chassis pic fpc-slot 0 pic-slot 0
FPC slot 0, PIC slot 0 information:
  Type 48x 10G-SFP+ Builtin
  State Online
  Uptime 3 days, 3 hours, 5 minutes, 20 seconds
```

### show chassis pic fpc-slot pic-slot (QFX5100 Switches and OCX Series )

```
user@switch> show chassis pic fpc-slot 0 pic-slot 0
FPC slot 0, PIC slot 0 information:
  Type                Unknown Builtin
  State              Online
  Uptime             1 day, 17 hours, 5 minutes, 9 seconds
```

### show chassis pic interconnect-device fpc-slot pic-slot (QFabric Systems)

```
user@switch> show chassis pic interconnect-device interconnect1 fpc-slot 9 pic-slot 0
FPC slot 9, PIC slot 0 information:
  Type                16x 40G-GE Builtin
  State              Online
  Uptime             2 hours, 47 minutes, 40 seconds
```

### show chassis pic node-device fpc-slot pic-slot (QFabric System)

```
user@switch> show chassis pic node-device node1 pic-slot 0
FPC slot node1, PIC slot 0 information:
  Type                48x 10G-SFP+ Builtin
```



State		Online				
Uptime		2 hours, 52 minutes, 37 seconds				
PIC port information:						
		Fiber	Xcvr vendor			
Port	Cable type	type	Xcvr vendor	part number	Wavelength	
0	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
1	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
2	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
3	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
4	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
5	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
6	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
7	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
8	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
9	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
10	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
11	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
12	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
13	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
14	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
15	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
16	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
17	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
18	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
19	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
20	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
21	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
22	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
23	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
24	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
25	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
26	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
27	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
28	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
29	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
30	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
31	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
32	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
33	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
34	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
35	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
36	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
37	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
38	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
39	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
40	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
41	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
42	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
43	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
44	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
45	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
46	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	
47	10GBASE SR	MM	SumitomoElectric	SPP5101SR-J3	850 nm	

show chassis pic fpc-slot 0 pic-slot 1 (ACX2000 Universal Metro Router)

user@host> show chassis pic fpc-slot 0 pic-slot 1

FPC slot 0, PIC slot 1 information:

Type	8x 1GE(LAN) RJ45 Built-in
State	Online
Uptime	6 days, 2 hours, 51 minutes, 11 seconds

#### show chassis pic fpc-slot 1 PIC-slot 0 (MX Routers with Media Services Blade [MSB])

user@switch> show chassis pic fpc-slot 1 pic-slot 0

FPC slot 1, PIC slot 0 information:

Type	AS-MSB
State	Online
PIC version	1.6
Uptime	11 hours, 17 minutes, 56 seconds

#### show chassis pic fpc slot 1, PIC slot 2 (MX Routers with Media Services Blade [MSB])

user@switch> show chassis pic fpc-slot 1 pic-slot 2

Type	AS-MXC
State	Online
PIC version	1.0
Uptime	11 hours, 18 minutes, 3 seconds

#### show chassis pic transport fpc-slot pic-slot (PTX Series Packet Transport Routers)

user@host> show chassis pic transport fpc-slot 2 pic-slot 0

Administrative State:	In Service
Operational State:	Normal

#### show chassis pic transport fpc-slot pic-slot (MX960 Router with MPC3E and 100-Gigabit DWDM OTN MIC)

user@host> show chassis pic transport fpc-slot 3 pic-slot 0

Administrative State:	In Service
Operational State:	Normal

#### show chassis pic fpc-slot 0 pic-slot 0 (ACX5096 Router)

user@host> show chassis pic fpc-slot 0 pic-slot 0

FPC slot 0, PIC slot 0 information:

Type	96x10G-8x40G
State	Online
PIC version	2.9
Uptime	21 hours, 28 minutes, 13 seconds

PIC port information:

		Fiber		Xcvr vendor	Wave-	Xcvr
Port	Cable type	type	Xcvr vendor	part number	length	
0	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
1	10GBASE LR	SM	FINISAR CORP.	FTLX1471D3BCL-J1	1310 nm	0.0

3	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BNL-J1	850 nm	0.0
4	10GBASE SR	MM	SumitomoElectric	SPP5100SR-J3	850 nm	0.0
5	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BNL-J1	850 nm	0.0
6	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BNL-J1	850 nm	0.0
7	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BNL-J1	850 nm	0.0
8	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BNL-J1	850 nm	0.0
9	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BNL-J1	850 nm	0.0
10	10GBASE SR	MM	OPNEXT, INC.	TRS2001EN-0014	850 nm	0.0
11	10GBASE SR	MM	SumitomoElectric	SPP5100SR-J3	850 nm	0.0
12	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BNL-J1	850 nm	0.0
13	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
14	10GBASE SR	MM	SumitomoElectric	SPP5100SR-J3	850 nm	0.0
15	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BNL-J1	850 nm	0.0
16	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BNL-J1	850 nm	0.0
17	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BNL-J1	850 nm	0.0
18	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
19	10GBASE LR	SM	FINISAR CORP.	FTLX1471D3BCL-J1	1310 nm	0.0
20	10GBASE LR	SM	FINISAR CORP.	FTLX1471D3BNL-J1	1310 nm	0.0
21	10GBASE SR	MM	SumitomoElectric	SPP5100SR-J3	850 nm	0.0
22	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BNL-J1	850 nm	0.0
23	10GBASE SR	MM	SumitomoElectric	SPP5100SR-J3	850 nm	0.0
24	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
25	10GBASE USR	MM	FINISAR CORP.	FTLX8570D3BCL-J1	850 nm	0.0
26	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BNL-J1	850 nm	0.0
27	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
28	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BNL-J1	850 nm	0.0
29	GIGE 1000SX	MM	FINISAR CORP.	FTLF8519P3BNL-J1	850 nm	0.0
31	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BNL-J1	850 nm	0.0
32	10GBASE SR	MM	SumitomoElectric	SPP5100SR-J3	850 nm	0.0
33	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0

34	10GBASE SR	MM	SumitomoElectric	SPP5100SR-J3	850 nm	0.0
35	10GBASE USR	MM	FINISAR CORP.	FTLX8570D3BCL-J1	850 nm	0.0
36	10GBASE USR	MM	FINISAR CORP.	FTLX8570D3BCL-J1	850 nm	0.0
37	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BNL-J1	850 nm	0.0
38	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
40	GIGE 1000LX10	SM	FINISAR CORP.	FTLF1318P2BTL-J1	1310 nm	0.0
41	10GBASE LR	SM	OPNEXT, INC	TRS5021EN-S201	1310 nm	0.0
42	10GBASE LR	SM	FINISAR CORP.	FTLX1471D3BCL-J1	1310 nm	0.0
43	10GBASE LR	SM	SumitomoElectric	SPP5100LR-J3	1310 nm	0.0
44	10GBASE LR	SM	SumitomoElectric	SPP5100LR-J3	1310 nm	0.0
45	10GBASE LR	SM	FINISAR CORP.	FTLX1471D3BCL-J1	1310 nm	0.0
46	10GBASE LR	SM	FINISAR CORP.	FTLX1471D3BCL-J1	1310 nm	0.0
47	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BNL-J1	850 nm	0.0
48	10GBASE SR	MM	SumitomoElectric	SPP5100SR-J3	850 nm	0.0
49	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BNL-J1	850 nm	0.0
50	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BNL-J1	850 nm	0.0
51	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
52	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
53	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
54	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
55	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
56	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
57	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
58	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
59	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
60	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
61	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
62	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
63	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
64	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0

65	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
66	10GBASE SR	MM	SumitomoElectric	SPP5200SR-J6-M	850 nm	0.0
67	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
68	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
69	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
70	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
71	10GBASE LR	SM	FINISAR CORP.	FTLX1471D3BNL-J1	1310 nm	0.0
72	10GBASE LR	SM	FINISAR CORP.	FTLX1471D3BCL-J1	1310 nm	0.0
73	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
74	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
75	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
76	10GBASE SR	MM	SumitomoElectric	SPP5100SR-J3	850 nm	0.0
77	10GBASE USR	MM	OPNEXT, INC.	TRS20A0EN-0014	850 nm	0.0
78	10GBASE USR	MM	OPNEXT, INC.	TRS20A0EN-0014	850 nm	0.0
79	10GBASE LRM	MM	OPNEXT INC	TRS5001EN-0014	1310 nm	0.0
80	10GBASE LRM	MM	OPNEXT INC	TRS5001EN-0014	1310 nm	0.0
81	10GBASE USR	MM	OPNEXT, INC.	TRS20A0EN-0014	850 nm	0.0
82	10GBASE USR	MM	OPNEXT, INC.	TRS20A0EN-0014	850 nm	0.0
83	10GBASE USR	MM	OPNEXT, INC.	TRS20A0EN-0014	850 nm	0.0
84	10GBASE USR	MM	OPNEXT, INC.	TRS20A0EN-0014	850 nm	0.0
85	10GBASE LR	SM	OPNEXT, INC	TRS5021EN-S201	1310 nm	0.0
86	10GBASE ER	SM	OPNEXT, INC	TRS7050EN-S201	1550 nm	0.0
87	10GBASE LRM	MM	OPNEXT INC	TRS5001EN-0014	1310 nm	0.0
88	10GBASE LRM	MM	OPNEXT INC	TRS5001EN-0014	1310 nm	0.0
89	10GBASE LRM	MM	OPNEXT INC	TRS5001EN-0014	1310 nm	0.0
90	10GBASE LRM	MM	OPNEXT INC	TRS5001EN-0014	1310 nm	0.0
91	10GBASE USR	MM	FINISAR CORP.	FTLX8570D3BCL-J1	850 nm	0.0
92	10GBASE USR	MM	FINISAR CORP.	FTLX8570D3BCL-J1	850 nm	0.0
93	10GBASE LR	SM	SumitomoElectric	SPP5100LR-J3	1310 nm	0.0
94	10GBASE LR	SM	FINISAR CORP.	FTLX1471D3BNL-J1	1310 nm	0.0

95	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BNL-J1	850 nm	0.0
96	40GBASE SR4	MM	AVAGO	AFBR-79E4Z-D-JU1	850 nm	0.0
97	40GBASE SR4	MM	AVAGO	AFBR-79E4Z-D-JU1	850 nm	0.0
98	40GBASE SR4	MM	AVAGO	AFBR-79EQDZ-JU1	850 nm	0.0
99	40GBASE SR4	MM	AVAGO	AFBR-79EQDZ-JU1	850 nm	0.0
100	40GBASE CU 1M	n/a	Molex Inc.	1110409055	n/a	0.0
101	40GBASE CU 1M	n/a	Molex Inc.	1110409055	n/a	0.0
102	40GBASE CU 1M	n/a	Molex Inc.	1110409055	n/a	0.0
103	40GBASE CU 1M	n/a	Molex Inc.	1110409055	n/a	0.0

#### show chassis pic fpc-slot 0 pic-slot 0 (ACX5048 Router)

```
user@host> show chassis pic fpc-slot 0 pic-slot 0
```

FPC slot 0, PIC slot 0 information:

Type	96x10G-8x40G
State	Online
PIC version	2.9
Uptime	1 day, 5 hours, 27 minutes, 25 seconds

PIC port information:

		Fiber		Xcvr vendor	Wave-	Xcvr
Port	Cable type	type	Xcvr vendor	part number	length	
Firmware						
0	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
10	GIGE 1000SX	MM	FINISAR CORP.	FTLF8519P3BNL-J1	850 nm	0.0
14	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BNL-J1	850 nm	0.0
20	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BCL-J1	850 nm	0.0
30	GIGE 1000SX	MM	FINISAR CORP.	FTLF8519P2BNL-J1	850 nm	0.0
41	10GBASE SR	MM	OPNEXT, INC.	TRS2001EN-0014	850 nm	0.0
46	GIGE 1000SX	MM	FINISAR CORP.	FTLF8519P2BNL-J1	850 nm	0.0
64	10GBASE SR	MM	FINISAR CORP.	FTLX8571D3BNL-J1	850 nm	0.0
78	GIGE 1000SX	MM	AVAGO	AFBR-5715PZ-JU2	850 nm	0.0
96	40GBASE SR4	MM	AVAGO	AFBR-79EQDZ-JU1	850 nm	0.0
99	40GBASE SR4	MM	AVAGO	AFBR-79EQDZ-JU1	850 nm	0.0
100	40GBASE SR4	MM	AVAGO	AFBR-79EQDZ-JU1	850 nm	0.0

**show chassis pic fpc-slot 0 pic-slot 0 (ACX500 Router)**

```
user@host> show chassis pic fpc-slot 0 pic-slot 0
FPC slot 0, PIC slot 0 information:
  Type                2x 1GE(LAN) SFP Builtin
  State               Online
  Uptime              17 hours, 54 minutes, 45 seconds
```

**show chassis pic fpc-slot 0 pic-slot 1 (ACX500 Router)**

```
user@host> show chassis pic fpc-slot 0 pic-slot 1
FPC slot 0, PIC slot 1 information:
  Type                4x 1GE(LAN) RJ45, SFP Builtin
  State               Online
  Uptime              17 hours, 54 minutes, 45 seconds
```

**show chassis pic transport fpc-slot pic-slot (PTX Series Packet Transport Routers)**

```
user@host> show chassis pic transport fpc-slot 2 pic-slot 0
Administrative State:    In Service
Operational State:      Normal
```

**show chassis pic transport fpc-slot pic-slot (MX960 Router with MPC3E and 100-Gigabit DWDM OTN MIC)**

```
user@host> show chassis pic transport fpc-slot 3 pic-slot 0
Administrative State:    In Service
Operational State:      Normal
```

**show chassis pic fpc-slot 0 pic-slot 0 (EX9251 Switches)**

```
user@switch> show chassis pic fpc-slot 0 pic-slot 0
FPC slot 0, PIC slot 0 information:
  Type                4XQSFP28 PIC
  State               Online
  PIC version         0.0
  Uptime              1 day, 2 hours, 22 minutes, 3 seconds

PIC port information:
  JNPR
  Port Cable type    Fiber      Xcvr vendor      Wave-   Xcvr
  Firmware Rev       type    Xcvr vendor      part number      length
  0  40GBASE CU 50CM  n/a  Amphenol        601100000        n/a      0.0
      REV 01
  2  40GBASE SR4     MM    AVAGO           AFBR-79EQDZ-JU2  850 nm  0.0
      REV 01

Port speed information:
  Port  PFE      Capable Port Speeds
  0      0      4x10GE, 40GE, 100GE
  1      0      4x10GE, 40GE, 100GE
  2      0      4x10GE, 40GE, 100GE
  3      0      4x10GE, 40GE, 100GE
```

**show chassis pic fpc-slot 0 pic-slot 0 (EX9253 Switches)**

```
user@switch> show chassis pic fpc-slot 0 pic-slot 0
```

```
FPC slot 0, PIC slot 0 information:
```

```
Type          6xQSFP
State          Online
PIC version    0.0
Uptime        1 day, 7 minutes, 11 seconds
```

```
PIC port information:
```

	JNPR	Fiber	Xcvr vendor	Wave-	Xcvr
Port	Cable type	type	Xcvr vendor	part number	length
Firmware	Rev				
0	4X10GBASE SR	MM	AVAGO	AFBR-79EEPZ-JU2	850 nm
	REV 01				0.0

```
Port speed information:
```

Port	PFE	Capable Port Speeds
0	0	4x10GE, 40GE
1	0	4x10GE, 40GE
2	1	4x10GE, 40GE
3	1	4x10GE, 40GE
4	2	4x10GE, 40GE
5	2	4x10GE, 40GE



## show chassis power

**List of Syntax**    [Syntax on page 2047](#)  
                           [Syntax \(MX Series Router\) on page 2047](#)  
                           [Syntax \(MX2020 Universal Routing Platforms\) on page 2047](#)  
                           [Syntax \(PTX Series\) on page 2047](#)  
                           [Syntax \(MX2010 and, MX10003, MX2008 Universal Routing Platforms\) on page 2047](#)  
                           [Syntax \(MX10008 Universal Routing Platforms\) on page 2047](#)  
                           [Syntax \(EX9200, EX9253 Switches\) on page 2047](#)

**Syntax**    `show chassis power`

**Syntax (MX Series Router)**    `show chassis power`  
   `<all-members>`  
   `<local>`  
   `<member member-id>`  
   `<detail>`

**Syntax (MX2020 Universal Routing Platforms)**    `show chassis power`  
   `<detail>`

**Syntax (PTX Series)**    `show chassis power`  
   `<detail>`

**Syntax (MX2010 and, MX10003, MX2008 Universal Routing Platforms)**    `show chassis power`  
   `<detail>`

**Syntax (MX10008 Universal Routing Platforms)**    `show chassis power`  
   `<detail>`  
   `<sequence>`

**Syntax (EX9200, EX9253 Switches)**    `show chassis power`  
   `<detail>`

**Release Information**    Command introduced in Junos OS Release 10.0.  
                                   Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Routers.  
                                   Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.  
                                   Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.  
                                   Command introduced in Junos OS Release 12.3 for EX9200 switches, with **detail** option added in Junos OS Release 15.2.

Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.  
Command introduced in Junos OS Release 17.2 for PTX10008 Routers.  
Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.  
Command introduced in Junos OS Release 18.2 for EX9253 Switches.  
Command introduced in Junos OS Release 18.2 for MX10008 Universal Routing Platforms.

**Description** (EX9200 switches, MX Series 5G Universal Routing Platforms and PTX Series Packet Transport Routers only) Display power limits and usage information for the AC or DC power sources.

- On EX9200 switches and the MX Series 5G Universal Routing Platforms, power is supplied by Power Entry Modules (PEMs).



**NOTE:** The new high-capacity (4100 W) enhanced DC PEM on MX960 routers includes a new design that can condition the input voltage. This results in the output voltage differing from the input voltage. The earlier generation of DC PEMs coupled the input power directly to the output, thereby making it safe to assume that the output voltage was equal to the input voltage.

---

- On the MX2020 Universal Routing Platforms, the power system consists of three components: the power supply modules (PSMs), the power distribution module (PDM), and the power midplane. The power feed is connected to the PDM. The PDM delivers power to the power midplane. The power midplane supplies power to the PSMs. The MX2020 router chassis provides 3+3 (2500W/80A) or 4+4 (2100W/60A) PSM redundancy for the critical FRUs with two power zones.
- On the MX2010 and MX2008 Universal Routing Platforms, the power system consists of three components: the power supply modules (PSMs), the power distribution module (PDM), and the power midplane. The power feed is connected to the PDM. The PDM delivers power to the power midplane. The power midplane supplies power to the PSMs. Unlike the MX2020 router chassis, the MX2010 and MX2008 router chassis does not provide redundancy for the critical FRUs because there is only one power zone.

Starting from Junos OS Release 17.3, MX10003 routers support DC (1100W), AC High (1600W), and AC Low (800W) power supply units.

- On the PTX Series Packet Transport Routers, power is supplied by power supply modules (PSMs). On PTX5000 routers, the power feeds connect to the power distribution units (PDUs).
- Starting with Junos OS Release 14.1, the **show chassis power <detail>** operational mode command output displays power usage information for the new DC power supply module (PSM) and power distribution unit (PDU) that are added to provide power to the high-density FPC (FPC2-PTX-P1A) and other components in a PTX5000 Packet Transport Router. The output also displays power usage information for each PIC that is connected to the router. This command also displays power usage information for MX Series routers that have a MPC5EQ MPC installed.

<b>Options</b>	<p><b>none</b>—Display basic power usage information for the AC and DC power sources.</p> <p><b>all-members</b>—(MX Series routers only) (Optional) Display power usage information for all members of the Virtual Chassis configuration.</p> <p><b>detail</b>—(Optional) Include power usage for specific FRUs.</p> <p><b>local</b>—(MX Series routers only) (Optional) Display power usage information for the local Virtual Chassis member.</p> <p><b>member <i>member-id</i></b>—(MX Series routers only) (Optional) Display power usage information for the specified member of the Virtual Chassis configuration. For an MX Series Virtual Chassis, replace <i>member-id</i> with a value of 0 or 1.</p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">show chassis power sequence on page 2076</a></li> <li>• <a href="#">Checklist for Monitoring Power Supplies</a></li> </ul>
<b>List of Sample Output</b>	<p><a href="#">show chassis power (MX960 Router with DC PEM) on page 2052</a></p> <p><a href="#">show chassis power (MX960 Router with AC PEM) on page 2053</a></p> <p><a href="#">show chassis power (MX960 Router with MPC5EQ) on page 2054</a></p> <p><a href="#">show chassis power detail (MX960 Router with MPC5EQ) on page 2054</a></p> <p><a href="#">show chassis power (MX480 Router with AC PEM) on page 2055</a></p> <p><a href="#">show chassis power (MX240 Router with DC PEM) on page 2056</a></p> <p><a href="#">show chassis power (MX2010 Router) on page 2056</a></p> <p><a href="#">show chassis power (MX2020 Router) on page 2057</a></p> <p><a href="#">show chassis power (MX2020 Router with MPC5EQ and MPC6E) on page 2059</a></p> <p><a href="#">show chassis power detail (MX2020 Router with MPC5EQ and MPC6E) on page 2061</a></p> <p><a href="#">show chassis power (MX2020 Router with 240-V high-voltage DC PSMs and PDMs) on page 2064</a></p> <p><a href="#">show chassis power (MX2008 Router) on page 2066</a></p> <p><a href="#">show chassis power (MX10003) on page 2067</a></p> <p><a href="#">show chassis power (MX10008) on page 2067</a></p> <p><a href="#">show chassis power (PTX5000 Packet Transport Router) on page 2068</a></p> <p><a href="#">show chassis power (PTX5000 Packet Transport Router with FPC2-PTX-P1A) on page 2069</a></p> <p><a href="#">show chassis power detail (PTX5000 Packet Transport Router) on page 2069</a></p> <p><a href="#">show chassis power detail (PTX5000 Packet Transport Router with FPC2-PTX-P1A) on page 2070</a></p> <p><a href="#">show chassis power detail (PTX10008 Router) on page 2071</a></p> <p><a href="#">show chassis power detail (PTX10016 Router) on page 2072</a></p> <p><a href="#">show chassis power detail (EX9208 Switch) on page 2073</a></p> <p><a href="#">show chassis power detail (EX9253 Switch) on page 2074</a></p>
<b>Output Fields</b>	<p><a href="#">Table 152 on page 2050</a> lists the output fields for the <b>show chassis power</b> command. Output fields are listed in the approximate order in which they appear.</p>

Table 152: show chassis power Output Fields:

Field Name	Field Description	Level of Output
<b>PEM number</b>	<p>(EX9200 switches and MX Series routers only) AC or DC PEM number on the chassis. The following output fields are displayed for the PEM:</p> <ul style="list-style-type: none"> <li>• <b>State</b>—State of the PEM: <ul style="list-style-type: none"> <li>• <b>Online</b>—PEM is present in the slot and online.</li> <li>• <b>Empty</b>—PEM is not present in the slot.</li> <li>• <b>Present</b>—PEM is present in the slot, but not online.</li> </ul> </li> <li>• <b>AC/DC Input—OK or Check</b>—State of the AC or DC input power feed with the number of active and expected feeds (one or two). For a DC input power feed, this output field also displays the reference voltage input with maximum input voltage displayed in mV (in parentheses) for the AC or DC PEM.</li> <li>• <b>Capacity</b>—Actual power input capacity with maximum capacity displayed (in parentheses) in watts.</li> </ul> <p><b>NOTE:</b> The maximum actual power capacity for AC and DC PEMs is:</p> <ul style="list-style-type: none"> <li>• MX960 AC PEM—4100 W if two feeds are connected. 1700 W if one feed is connected.</li> <li>• MX960 DC PEM—4100 W if two feeds are connected. 1700 W if one feed is connected.</li> <li>• MX480 AC PEM—2520 W if it is high-line. 1450 W if it is low-line.</li> <li>• MX480 DC PEM—2240 W if the DIP switch is off. 2440 W if the DIP switch is on.</li> <li>• MX240 AC PEM—2240 W if it is high-line. 2440 W if it is low-line.</li> <li>• MX240 DC PEM—2240 W if the DIP switch is off. 2440 W if the DIP switch is on.</li> <li>• EX9204 AC PEM—2050 W if it is high-line. 1167 W if it is low-line.</li> <li>• EX9204 DC PEM—2400 W if the DIP switch is off. 2600 W if the DIP switch is on.</li> <li>• EX9208 AC PEM—2050 W if it is high-line. 1167 W if it is low-line.</li> <li>• EX9208 DC PEM—2400 W if the DIP switch is off. 2600 W if the DIP switch is on.</li> <li>• EX9214 AC PEM—4100 W if two feeds are connected. 1700 W if one feed is connected.</li> <li>• EX9214 DC PEM—4100 W if two feeds are connected. 1700 W if one feed is connected.</li> <li>• <b>DC Output</b>—DC power output in Watts for the specified zone, at the specified amps and voltage (A @ V), and load and percentage utilization of the maximum capacity) for the zone.</li> </ul>	All levels

Table 152: show chassis power Output Fields: (continued)

Field Name	Field Description	Level of Output
<b>System</b>	<p>(EX9200 switches, MX Series, MX2020 routers, MX2010 routers, and MX2008 routers only) Overall power statistics for the system zone.</p> <p>The following output fields are displayed for MX Series routers:</p> <ul style="list-style-type: none"> <li>• <b>Zone number:</b> <ul style="list-style-type: none"> <li>• <b>Capacity</b>—Maximum power capacity applicable for the zone, in watts.</li> <li>• <b>Allocated power</b>—Actual capacity allocated for the zone, in watts, with remaining power displayed in parentheses.</li> <li>• <b>Actual usage</b>—Actual power usage for the zone, in watts.</li> </ul> </li> <li>• <b>Total system capacity</b>—Cumulative power capacity of all the zones, in watts.</li> <li>• <b>Total remaining capacity</b>—Difference between the <b>Total system capacity</b> and cumulative <b>Allocated power</b> of all the zones, in watts.</li> </ul> <p>The following output fields are displayed for MX2010, MX2020, and MX2008 routers:</p> <ul style="list-style-type: none"> <li>• <b>Capacity</b>—Maximum power capacity applicable for the zone, in watts.</li> <li>• <b>Allocated power</b>—Actual capacity allocated for the zone, in watts, with remaining power displayed in parentheses.</li> <li>• <b>Actual usage</b>—Actual power usage for the zone, in watts.</li> </ul> <p><b>NOTE:</b> For MX2020 routers, there are two power subsystems (Lower Zone and Upper Zone) and the listed output fields are displayed for each zone.</p>	All levels
<b>Total Power</b>	(PTX Series only) Total power used by the switch (displayed in watts).	All levels
<b>PDU number</b>	(PTX5000 only) ID number of the power distribution unit (PDU) on the chassis.	All levels

Table 152: show chassis power Output Fields: (continued)

Field Name	Field Description	Level of Output
<b>PSM number</b>	<p>(PTX Series, MX2020 routers, MX2010 routers, and MX2008 routers only) ID number of the power supply module..</p> <p>(PTX Series) The following output fields are displayed for each PSM:</p> <ul style="list-style-type: none"> <li>• <b>Input (V)</b>—Voltage supplied to the PSM.</li> <li>• <b>Used (W)</b>—Actual power usage for the PSM (measured in watts).</li> </ul> <p><b>NOTE:</b> Starting with Junos OS Release 14.1, no output is displayed for <b>Input (v)</b> and <b>Used (W)</b> fields for missing PSMs; unlike in earlier releases where 0 was displayed for missing PSMs.</p> <p>(MX2010, MX2020, and MX2008 routers) The following output fields are displayed for each PSM:</p> <ul style="list-style-type: none"> <li>• <b>State</b>—State of the PSM: <ul style="list-style-type: none"> <li>• <b>Online</b>—PSM is present in the slot and online.</li> <li>• <b>Empty</b>—PSM is not present in the slot.</li> <li>• <b>Present</b>—PSM is present in the slot but not online.</li> </ul> </li> <li>• <b>DC Input</b>—State of the DC input power feed with the number of active or expected feeds (in parentheses).</li> <li>• <b>Capacity</b>—Actual power input capacity and maximum capacity (in parentheses) displayed in watts.</li> </ul> <p><b>NOTE:</b> The maximum capacity for AC and DC PSMs is:</p> <ul style="list-style-type: none"> <li>• MX2010/MX2020/MX2008 AC PSM—2500 W.</li> <li>• MX2010/MX2020/MX2008 DC PSM—2100 W if the DIP switch is at 60A settings. 2500 W if the DIP switch is at 80A settings.</li> </ul> <li>• <b>DC Output</b>—DC power output in watts for the specified zone at the specified amperes and voltage (A at V), and load and percentage utilization of the maximum capacity for the zone.</li>	All levels
<b>Item</b>	<p>Actual power usage (measured in watts) for the following FRUs:</p> <ul style="list-style-type: none"> <li>• <b>Fan Tray n</b>—Power usage for the specified fan tray.</li> <li>• <b>REn/CBn</b>—Power usage for the specified Routing Engines and Control Boards</li> <li>• <b>SIB/CCG/FPD</b>—Power usage for the Switch Interface Board, Centralized Clock Generator (PTX5000 only), and Front Panel Display (craft interface).</li> <li>• <b>FPC n</b>—Power usage for the FPC in the slot specified.</li> </ul> <p><b>NOTE:</b> MX Series routers must have a MPC5EQ MPC installed to view FRU power usage with the <b>detail</b> command.</p>	<b>detail</b>

## Sample Output

### show chassis power (MX960 Router with DC PEM)

```

user@host> show chassis power

PEM 0:
  State:    Online

```

```

DC input: OK (2 feed expected, 2 feed connected)
DC input: 48.0 V input (57000 mV)
Capacity: 4100 W (maximum 4100 W)
DC output: 513 W (zone 0, 9 A at 57 V, 12% of capacity)

PEM 1:
State: Online
DC input: OK (2 feed expected, 2 feed connected)
DC input: 48.0 V input (57000 mV)
Capacity: 4100 W (maximum 4100 W)
DC output: 228 W (zone 1, 4 A at 57 V, 5% of capacity)

PEM 2:
State: Online
DC input: OK (2 feed expected, 2 feed connected)
DC input: 48.0 V input (57000 mV)
Capacity: 4100 W (maximum 4100 W)
DC output: 513 W (zone 0, 9 A at 57 V, 12% of capacity)

PEM 3:
State: Online
DC input: OK (2 feed expected, 2 feed connected)
DC input: 48.0 V input (57000 mV)
Capacity: 4100 W (maximum 4100 W)
DC output: 342 W (zone 1, 6 A at 57 V, 8% of capacity)

System:
Zone 0:
Capacity: 4100 W (maximum 4100 W)
Allocated power: 1680 W (2420 W remaining)
Actual usage: 1026 W
Zone 1:
Capacity: 4100 W (maximum 4100 W)
Allocated power: 1263 W (2837 W remaining)
Actual usage: 570 W
Total system capacity: 8200 W (maximum 8200 W)
Total remaining power: 5257 W

```

### show chassis power (MX960 Router with AC PEM)

```

user@host> show chassis power

PEM 0:
State: Online
AC input: OK (2 feed expected, 2 feed connected)
Capacity: 4100 W (maximum 4100 W)
DC output: 0 W (zone 0, 0 A at 56 V, 0% of capacity)

PEM 1:
State: Present
AC input: Check (2 feed expected, 1 feed connected)
Capacity: 1700 W (maximum 4100 W)

PEM 2:
State: Empty
Input: Absent

PEM 3:
State: Online
AC input: OK (1 feed expected, 1 feed connected)

```

```

Capacity: 1700 W (maximum 1700 W)

System:
Zone 0:
  Capacity: 4100 W (maximum 4100 W)
  Allocated power: 540 W (3560 W remaining)
  Actual usage: 0 W
Zone 1:
  Capacity: 0 W (maximum 0 W)
  Allocated power: 0 W (0 W remaining)
  Actual usage: 0 W
Total system capacity: 4100 W (maximum 4100 W)
Total remaining power: 3560 W

```

### show chassis power (MX960 Router with MPC5EQ)

```

user@host> show chassis power

PEM 0:
  State: Online
  AC input: OK (2 feed expected, 2 feed connected)
  Capacity: 4100 W (maximum 4100 W)
  DC output: 1197 W (zone 0, 21 A at 57 V, 29% of capacity)

PEM 1:
  State: Online
  AC input: OK (2 feed expected, 2 feed connected)
  Capacity: 4100 W (maximum 4100 W)
  DC output: 2451 W (zone 1, 43 A at 57 V, 59% of capacity)

PEM 2:
  State: Online
  AC input: OK (2 feed expected, 2 feed connected)
  Capacity: 4100 W (maximum 4100 W)
  DC output: 1083 W (zone 0, 19 A at 57 V, 26% of capacity)

PEM 3:
  State: Empty
  Input: Absent

System:
Zone 0:
  Capacity: 4100 W (maximum 4100 W)
  Allocated power: 3508 W (592 W remaining)
  Actual usage: 2280 W
Zone 1:
  Capacity: 4100 W (maximum 4100 W)
  Allocated power: 3341 W (759 W remaining)
  Actual usage: 2451 W
Total system capacity: 8200 W (maximum 8200 W)
Total remaining power: 1351 W

```

### show chassis power detail (MX960 Router with MPC5EQ)

```

user@host> show chassis power detail

PEM 0:
  State: Online
  DC input: OK (2 feed expected, 2 feed connected)

```



```

DC input: 48.0 V input (57500 mV)
Capacity: 4100 W (maximum 4100 W)
DC output: 798 W (zone 0, 14 A at 57 V, 19% of capacity)

PEM 1:
State: Online
DC input: OK (2 feed expected, 2 feed connected)
DC input: 48.0 V input (57500 mV)
Capacity: 4100 W (maximum 4100 W)
DC output: 1311 W (zone 1, 23 A at 57 V, 31% of capacity)

PEM 2:
State: Online
DC input: OK (2 feed expected, 2 feed connected)
DC input: 48.0 V input (57500 mV)
Capacity: 4100 W (maximum 4100 W)
DC output: 855 W (zone 0, 15 A at 57 V, 20% of capacity)

PEM 3:
State: Online
DC input: OK (2 feed expected, 2 feed connected)
DC input: 48.0 V input (57500 mV)
Capacity: 4100 W (maximum 4100 W)
DC output: 912 W (zone 1, 16 A at 57 V, 22% of capacity)

System:
Zone 0:
Capacity: 4100 W (maximum 4100 W)
Allocated power: 2497 W (1603 W remaining)
Actual usage: 1653 W
Zone 1:
Capacity: 4100 W (maximum 4100 W)
Allocated power: 3336 W (764 W remaining)
Actual usage: 2223 W
Total system capacity: 8200 W (maximum 8200 W)
Total remaining power: 2367 W

Item          Used(W)
FPC 0         255
FPC 10        341

```

### show chassis power (MX480 Router with AC PEM)

```

user@host> show chassis power

PEM 0:
State: Online
AC input: OK (1 feed expected, 1 feed connected)
Capacity: 2520 W (maximum 2520 W)
DC output: 472 W (zone 0, 8 A at 59 V, 18% of capacity)

PEM 1:
State: Online
AC input: OK (1 feed expected, 1 feed connected)
Capacity: 2520 W (maximum 2520 W)
DC output: 472 W (zone 0, 8 A at 59 V, 18% of capacity)

PEM 2:
State: Online
AC input: OK (1 feed expected, 1 feed connected)

```

```
Capacity: 2520 W (maximum 2520 W)
DC output: 118 W (zone 0, 2 A at 59 V, 4% of capacity)
```

**PEM 3:**

```
State:      Empty
Input:      Absent
```

**System:**

```
Maximum capacity: 5040 W
Allocated capacity: 1675 W (33% of maximum)
Remaining capacity: 3365 W
Actual usage:      1062 W
```

### show chassis power (MX240 Router with DC PEM)

```
user@host> show chassis power
```

**PEM 0:**

```
State:      Online
DC input:    OK (1 feed expected, 1 feed connected)
DC input:    48.0 V input (53500 mV)
Capacity:    2400 W (maximum 2400 W)
DC output:   318 W (zone 0, 6 A at 53 V, 13% of capacity)
```

**PEM 1:**

```
State:      Online
DC input:    OK (1 feed expected, 1 feed connected)
DC input:    48.0 V input (54000 mV)
Capacity:    2400 W (maximum 2400 W)
DC output:   0 W (zone 0, 0 A at 54 V, 0% of capacity)
```

**PEM 2:**

```
State:      Online
DC input:    OK (1 feed expected, 1 feed connected)
DC input:    48.0 V input (52500 mV)
Capacity:    2400 W (maximum 2400 W)
DC output:   312 W (zone 0, 6 A at 52 V, 13% of capacity)
```

**PEM 3:**

```
State:      Online
DC input:    OK (1 feed expected, 1 feed connected)
DC input:    48.0 V input (55000 mV)
Capacity:    2400 W (maximum 2400 W)
DC output:   0 W (zone 0, 0 A at 55 V, 0% of capacity)
```

**System:**

```
Maximum capacity: 2400 W
Allocated capacity: 1270 W (52% of maximum)
Remaining capacity: 1130 W
Actual usage:      630 W
```

### show chassis power (MX2010 Router)

```
user@host > show chassis power
```

**PSM 0:**

```
State:      Online
DC input:    OK (INP0 feed expected, INP0 feed connected)
Capacity:    2500 W (maximum 2500 W)
```

```

DC output: 1022.06 W (19.75 A at 51.75 V, 40.88% of capacity)

PSM 1:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  996.19 W (19.25 A at 51.75 V, 39.85% of capacity)

PSM 2:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  1022.06 W (19.75 A at 51.75 V, 40.88% of capacity)

PSM 3:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  1004.25 W (19.50 A at 51.50 V, 40.17% of capacity)

PSM 4:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  996.19 W (19.25 A at 51.75 V, 39.85% of capacity)

PSM 5:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  1017.12 W (19.75 A at 51.50 V, 40.69% of capacity)

PSM 6:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  1009.12 W (19.50 A at 51.75 V, 40.37% of capacity)

PSM 7:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  996.19 W (19.25 A at 51.75 V, 39.85% of capacity)

PSM 8:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  1004.25 W (19.50 A at 51.50 V, 40.17% of capacity)

System:
  Capacity:           22500 W (maximum 22500 W)
  Allocated power:    12888 W (9612 W remaining)
  Actual usage:       9067.44 W

```

### show chassis power (MX2020 Router)

```
user@host > show chassis power
```

```
PSM 0:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  858.44 W (Lower Zone, 16.75 A at 51.25 V, 34.34% of capacity)

PSM 1:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  854.25 W (Lower Zone, 16.75 A at 51.00 V, 34.17% of capacity)

PSM 2:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  858.44 W (Lower Zone, 16.75 A at 51.25 V, 34.34% of capacity)

PSM 3:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  867.00 W (Lower Zone, 17.00 A at 51.00 V, 34.68% of capacity)

PSM 4:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  871.25 W (Lower Zone, 17.00 A at 51.25 V, 34.85% of capacity)

PSM 5:
  State:      Empty
  Input:      Absent

PSM 6:
  State:      Empty
  Input:      Absent

PSM 7:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  867.00 W (Lower Zone, 17.00 A at 51.00 V, 34.68% of capacity)

PSM 8:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  879.75 W (Lower Zone, 17.25 A at 51.00 V, 35.19% of capacity)

PSM 9:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  624.75 W (Upper Zone, 12.25 A at 51.00 V, 29.75% of capacity)

PSM 10:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
```

```

DC output: 615.00 W (Upper Zone, 12.00 A at 51.25 V, 29.29% of capacity)

PSM 11:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  624.75 W (Upper Zone, 12.25 A at 51.00 V, 29.75% of capacity)

PSM 12:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  624.75 W (Upper Zone, 12.25 A at 51.00 V, 29.75% of capacity)

PSM 13:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  612.00 W (Upper Zone, 12.00 A at 51.00 V, 29.14% of capacity)

PSM 14:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  627.81 W (Upper Zone, 12.25 A at 51.25 V, 29.90% of capacity)

PSM 15:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  627.81 W (Upper Zone, 12.25 A at 51.25 V, 29.90% of capacity)

PSM 16:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  615.00 W (Upper Zone, 12.00 A at 51.25 V, 29.29% of capacity)

PSM 17:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  624.75 W (Upper Zone, 12.25 A at 51.00 V, 29.75% of capacity)

System:
  Upper Zone:
    Capacity:      18900 W (maximum 22500 W)
    Allocated power: 12900 W (6000 W remaining)
    Actual usage:   5596.62 W
  Lower Zone:
    Capacity:      17500 W (maximum 17500 W)
    Allocated power: 12900 W (4600 W remaining)
    Actual usage:   6056.12 W
  Total system capacity: 36400 W (maximum 40000 W)
  Total remaining power: 10600 W

```

### show chassis power (MX2020 Router with MPC5EQ and MPC6E)

```
user@host> show chassis power
```

```
PSM 0:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  540.75 W (Lower Zone, 10.50 A at 51.50 V, 25.75% of capacity)

PSM 1:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  538.12 W (Lower Zone, 10.50 A at 51.25 V, 25.62% of capacity)

PSM 2:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  538.12 W (Lower Zone, 10.50 A at 51.25 V, 25.62% of capacity)

PSM 3:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  540.75 W (Lower Zone, 10.50 A at 51.50 V, 25.75% of capacity)

PSM 4:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  527.88 W (Lower Zone, 10.25 A at 51.50 V, 25.14% of capacity)

PSM 5:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  527.88 W (Lower Zone, 10.25 A at 51.50 V, 25.14% of capacity)

PSM 6:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  540.75 W (Lower Zone, 10.50 A at 51.50 V, 25.75% of capacity)

PSM 7:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  527.88 W (Lower Zone, 10.25 A at 51.50 V, 25.14% of capacity)

PSM 8:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  527.88 W (Lower Zone, 10.25 A at 51.50 V, 25.14% of capacity)

PSM 9:
  State:      Empty
  Input:      Absent

PSM 10:
  State:      Empty
```

```

Input:      Absent

PSM 11:
State:      Empty
Input:      Absent

PSM 12:
State:      Online
DC input:   OK (INP0 feed expected, INP0 feed connected)
Capacity:   2100 W (maximum 2500 W)
DC output:  515.00 W (Upper Zone, 10.00 A at 51.50 V, 24.52% of capacity)

PSM 13:
State:      Online
DC input:   OK (INP0 feed expected, INP0 feed connected)
Capacity:   2100 W (maximum 2500 W)
DC output:  517.50 W (Upper Zone, 10.00 A at 51.75 V, 24.64% of capacity)

PSM 14:
State:      Online
DC input:   OK (INP0 feed expected, INP0 feed connected)
Capacity:   2100 W (maximum 2500 W)
DC output:  515.00 W (Upper Zone, 10.00 A at 51.50 V, 24.52% of capacity)

PSM 15:
State:      Online
DC input:   OK (INP0 feed expected, INP0 feed connected)
Capacity:   2100 W (maximum 2500 W)
DC output:  527.88 W (Upper Zone, 10.25 A at 51.50 V, 25.14% of capacity)

PSM 16:
State:      Online
DC input:   OK (INP0 feed expected, INP0 feed connected)
Capacity:   2100 W (maximum 2500 W)
DC output:  530.44 W (Upper Zone, 10.25 A at 51.75 V, 25.26% of capacity)

PSM 17:
State:      Online
DC input:   OK (INP0 feed expected, INP0 feed connected)
Capacity:   2100 W (maximum 2500 W)
DC output:  515.00 W (Upper Zone, 10.00 A at 51.50 V, 24.52% of capacity)

System:
Upper Zone:
  Capacity:      12600 W (maximum 15000 W)
  Allocated power: 9436 W (3164 W remaining)
  Actual usage:  3120.81 W
Lower Zone:
  Capacity:      18900 W (maximum 22500 W)
  Allocated power: 10842 W (8058 W remaining)
Actual usage:    4810.00 W
Total system capacity: 31500 W (maximum 37500 W)
Total remaining power: 11222 W

```

### show chassis power detail (MX2020 Router with MPC5EQ and MPC6E)

```
user@host> show chassis power detail
```

```
PSM 0:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  540.75 W (Lower Zone, 10.50 A at 51.50 V, 25.75% of capacity)

PSM 1:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  538.12 W (Lower Zone, 10.50 A at 51.25 V, 25.62% of capacity)

PSM 2:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  538.12 W (Lower Zone, 10.50 A at 51.25 V, 25.62% of capacity)

PSM 3:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  540.75 W (Lower Zone, 10.50 A at 51.50 V, 25.75% of capacity)

PSM 4:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  515.00 W (Lower Zone, 10.00 A at 51.50 V, 24.52% of capacity)

PSM 5:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  527.88 W (Lower Zone, 10.25 A at 51.50 V, 25.14% of capacity)

PSM 6:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  540.75 W (Lower Zone, 10.50 A at 51.50 V, 25.75% of capacity)

PSM 7:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  527.88 W (Lower Zone, 10.25 A at 51.50 V, 25.14% of capacity)

PSM 8:
  State:      Online
  DC input:   OK (INP0 feed expected, INP0 feed connected)
  Capacity:   2100 W (maximum 2500 W)
  DC output:  530.44 W (Lower Zone, 10.25 A at 51.75 V, 25.26% of capacity)

PSM 9:
  State:      Empty
  Input:      Absent

PSM 10:
  State:      Empty
```



```

Input:      Absent

PSM 11:
State:      Empty
Input:      Absent

PSM 12:
State:      Online
DC input:   OK (INP0 feed expected, INP0 feed connected)
Capacity:   2100 W (maximum 2500 W)
DC output:  517.50 W (Upper Zone, 10.00 A at 51.75 V, 24.64% of capacity)

PSM 13:
State:      Online
DC input:   OK (INP0 feed expected, INP0 feed connected)
Capacity:   2100 W (maximum 2500 W)
DC output:  517.50 W (Upper Zone, 10.00 A at 51.75 V, 24.64% of capacity)

PSM 14:
State:      Online
DC input:   OK (INP0 feed expected, INP0 feed connected)
Capacity:   2100 W (maximum 2500 W)
DC output:  515.00 W (Upper Zone, 10.00 A at 51.50 V, 24.52% of capacity)

PSM 15:
State:      Online
DC input:   OK (INP0 feed expected, INP0 feed connected)
Capacity:   2100 W (maximum 2500 W)
DC output:  527.88 W (Upper Zone, 10.25 A at 51.50 V, 25.14% of capacity)

PSM 16:
State:      Online
DC input:   OK (INP0 feed expected, INP0 feed connected)
Capacity:   2100 W (maximum 2500 W)
DC output:  517.50 W (Upper Zone, 10.00 A at 51.75 V, 24.64% of capacity)

PSM 17:
State:      Online
DC input:   OK (INP0 feed expected, INP0 feed connected)
Capacity:   2100 W (maximum 2500 W)
DC output:  515.00 W (Upper Zone, 10.00 A at 51.50 V, 24.52% of capacity)

System:
Upper Zone:
Capacity:    12600 W (maximum 15000 W)
Allocated power: 9436 W (3164 W remaining)
Actual usage: 3110.38 W
Lower Zone:
Capacity:    18900 W (maximum 22500 W)
Allocated power: 10842 W (8058 W remaining)
Actual usage: 4799.69 W
Total system capacity: 31500 W (maximum 37500 W)
Total remaining power: 11222 W

Item          Used(W)
FPC 0         0
FPC 4         0
FPC 9        719
FPC 10       681
FPC 17       656

```

FPC 18	0
FPC 19	0

### show chassis power (MX2020 Router with 240-V high-voltage DC PSMs and PDMs)

```
user@host> show chassis power
```

```
PSM 0:
  State:      Online
  DC input:   OK (INP1 feed expected, INP1 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  197.81 W (Lower Zone, 3.75 A at 52.75 V, 7.91% of capacity)

PSM 1:
  State:      Online
  DC input:   OK (INP1 feed expected, INP1 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  171.44 W (Lower Zone, 3.25 A at 52.75 V, 6.86% of capacity)

PSM 2:
  State:      Online
  DC input:   OK (INP1 feed expected, INP1 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  184.62 W (Lower Zone, 3.50 A at 52.75 V, 7.38% of capacity)

PSM 3:
  State:      Online
  DC input:   OK (INP1 feed expected, INP1 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  184.62 W (Lower Zone, 3.50 A at 52.75 V, 7.38% of capacity)

PSM 4:
  State:      Online
  DC input:   OK (INP1 feed expected, INP1 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  183.75 W (Lower Zone, 3.50 A at 52.50 V, 7.35% of capacity)

PSM 5:
  State:      Online
  DC input:   OK (INP1 feed expected, INP1 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  196.88 W (Lower Zone, 3.75 A at 52.50 V, 7.88% of capacity)

PSM 6:
  State:      Online
  DC input:   OK (INP1 feed expected, INP1 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  183.75 W (Lower Zone, 3.50 A at 52.50 V, 7.35% of capacity)

PSM 7:
  State:      Online
  DC input:   OK (INP1 feed expected, INP1 feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  196.88 W (Lower Zone, 3.75 A at 52.50 V, 7.88% of capacity)

PSM 8:
  State:      Online
  DC input:   OK (INP1 feed expected, INP1 feed connected)
```

```
Capacity: 2500 W (maximum 2500 W)
DC output: 196.88 W (Lower Zone, 3.75 A at 52.50 V, 7.88% of capacity)

PSM 9:
State:      Online
DC input:   OK (INP0 feed expected, INP0 feed connected)
Capacity: 2500 W (maximum 2500 W)
DC output: 144.38 W (Upper Zone, 2.75 A at 52.50 V, 5.78% of capacity)

PSM 10:
State:      Online
DC input:   OK (INP0 feed expected, INP0 feed connected)
Capacity: 2500 W (maximum 2500 W)
DC output: 145.06 W (Upper Zone, 2.75 A at 52.75 V, 5.80% of capacity)

PSM 11:
State:      Online
DC input:   OK (INP0 feed expected, INP0 feed connected)
Capacity: 2500 W (maximum 2500 W)
DC output: 131.88 W (Upper Zone, 2.50 A at 52.75 V, 5.28% of capacity)

PSM 12:
State:      Online
DC input:   OK (INP0 feed expected, INP0 feed connected)
Capacity: 2500 W (maximum 2500 W)
DC output: 143.69 W (Upper Zone, 2.75 A at 52.25 V, 5.75% of capacity)

PSM 13:
State:      Online
DC input:   OK (INP0 feed expected, INP0 feed connected)
Capacity: 2500 W (maximum 2500 W)
DC output: 143.69 W (Upper Zone, 2.75 A at 52.25 V, 5.75% of capacity)

PSM 14:
State:      Online
DC input:   OK (INP0 feed expected, INP0 feed connected)
Capacity: 2500 W (maximum 2500 W)
DC output: 145.06 W (Upper Zone, 2.75 A at 52.75 V, 5.80% of capacity)

PSM 15:
State:      Online
DC input:   OK (INP0 feed expected, INP0 feed connected)
Capacity: 2500 W (maximum 2500 W)
DC output: 144.38 W (Upper Zone, 2.75 A at 52.50 V, 5.78% of capacity)

PSM 16:
State:      Online
DC input:   OK (INP0 feed expected, INP0 feed connected)
Capacity: 2500 W (maximum 2500 W)
DC output: 130.62 W (Upper Zone, 2.50 A at 52.25 V, 5.22% of capacity)

PSM 17:
State:      Online
DC input:   OK (INP0 feed expected, INP0 feed connected)
Capacity: 2500 W (maximum 2500 W)
DC output: 157.50 W (Upper Zone, 3.00 A at 52.50 V, 6.30% of capacity)

System:
Upper Zone:
Capacity:      22500 W (maximum 22500 W)
```

```

    Allocated power: 6757 W (15743 W remaining)
    Actual usage: 1286.25 W
  Lower Zone:
    Capacity: 22500 W (maximum 22500 W)
    Allocated power: 7240 W (15260 W remaining)
    Actual usage: 1696.62 W
  Total system capacity: 45000 W (maximum 45000 W)
  Total remaining power: 31003 W

```

### show chassis power (MX2008 Router)

```
user@host> show chassis power
```

```

PSM 0:
  State:      Empty
  Input:      Absent

PSM 1:
  State:      Online
  DC input:   OK (Both feed expected, Both feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  424.88 W (8.25 A at 51.50 V, 17.00% of capacity)

PSM 2:
  State:      Online
  DC input:   OK (Both feed expected, Both feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  435.62 W (8.50 A at 51.25 V, 17.42% of capacity)

PSM 3:
  State:      Online
  DC input:   OK (Both feed expected, Both feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  437.75 W (8.50 A at 51.50 V, 17.51% of capacity)

PSM 4:
  State:      Online
  DC input:   OK (Both feed expected, Both feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  424.88 W (8.25 A at 51.50 V, 17.00% of capacity)

PSM 5:
  State:      Online
  DC input:   OK (Both feed expected, Both feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  437.75 W (8.50 A at 51.50 V, 17.51% of capacity)

PSM 6:
  State:      Online
  DC input:   OK (Both feed expected, Both feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  424.88 W (8.25 A at 51.50 V, 17.00% of capacity)

PSM 7:
  State:      Online
  DC input:   OK (Both feed expected, Both feed connected)
  Capacity:   2500 W (maximum 2500 W)
  DC output:  422.81 W (8.25 A at 51.25 V, 16.91% of capacity)

PSM 8:

```

```

State:      Empty
Input:      Absent

System:
Capacity:   17500 W (maximum 17500 W)
Allocated power: 8440 W (9060 W remaining)
Actual usage: 3008.56 W

```

### show chassis power (MX10003)

```
user@host> show chassis power
```

```

PEM 0:
State:      Empty
Input:      Absent

PEM 1:
State:      Empty
Input:      Absent

PEM 2:
State:      Online
Capacity:   1100 W (maximum 1100 W)
DC input:   OK (1 feed expected, 1 feed connected)
DC output:  432 W (zone 0, 36 A at 12 V, 39% of capacity)

PEM 3:
State:      Empty
Input:      Absent

PEM 4:
State:      Online
Capacity:   1100 W (maximum 1100 W)
DC input:   OK (1 feed expected, 1 feed connected)
DC output:  420 W (zone 0, 35 A at 12 V, 38% of capacity)

PEM 5:
State:      Online
Capacity:   1100 W (maximum 1100 W)
DC input:   OK (1 feed expected, 1 feed connected)
DC output:  468 W (zone 0, 39 A at 12 V, 42% of capacity)

System:
Zone 0:
Capacity:   3300 W (maximum 3300 W)
Allocated power: 2301 W (999 W remaining)
Actual usage: 1320 W
Total system capacity: 3300 W (maximum 3300 W)
Total remaining power: 999 W

```

### show chassis power (MX10008)

```
user@host> show chassis power
```

```

PEM 0:
State:      Online
Capacity:   2700 W (maximum 2700 W)
AC input:   OK (Both feed expected, Both feed connected)

```

```

DC output: 1248 W (zone 0, 104 A at 12 V, 46% of capacity)

PEM 1:
  State:      Online
  Capacity:   2700 W (maximum 2700 W)
  AC input:   OK (Both feed expected, Both feed connected)
  DC output:  1248 W (zone 0, 104 A at 12 V, 46% of capacity)

PEM 2:
  State:      Online
  Capacity:   2700 W (maximum 2700 W)
  AC input:   OK (Both feed expected, Both feed connected)
  DC output:  1260 W (zone 0, 105 A at 12 V, 46% of capacity)

PEM 3:
  State:      Present
  Capacity:   2700 W (maximum 2700 W)
  AC input:   Not ready

PEM 4:
  State:      Present
  Capacity:   2700 W (maximum 2700 W)
  AC input:   Not ready

PEM 5:
  State:      Present
  Capacity:   2700 W (maximum 2700 W)
  AC input:   Not ready

System:
  Zone 0:
    Capacity:      8100 W (maximum 8100 W)
    Allocated power: 7105 W (995 W remaining)
    Actual usage:   3756 W
    Total system capacity: 8100 W (maximum 8100 W)
    Total remaining power: 995 W

```

### show chassis power (PTX5000 Packet Transport Router)

```

user@host> show chassis power

```

Chassis Power	Input(V)	Used(W)
Total Power		4006
PDU 0		1986
PSM 0		
Input 1	54	149
PSM 1		
Input 1	54	377
PSM 2		
Input 1	54	745
PSM 3		
Input 1	54	715
PDU 1		2020
PSM 0		
Input 1	54	246
PSM 1		
Input 1	54	332

PSM 2		
Input 1	54	721
PSM 3		
Input 1	54	721

### show chassis power (PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```
user@host> show chassis power
```

Chassis Power	Input(V)	Used(W)
Total Power		4402
PDU 0		2104
PSM 0		
Input 1	53	229
Input 2	53	375
PSM 1		
PSM 2		
Input 1	53	248
Input 2	53	323
PSM 3		
PSM 4		
Input 1	53	206
Input 2	53	255
PSM 5		
PSM 6		
Input 1	53	206
Input 2	53	262
PSM 7		
PDU 1		2298
PSM 0		
PSM 1		
Input 1	53	289
Input 2	53	267
PSM 2		
PSM 3		
Input 1	53	309
Input 2	53	315
PSM 4		
PSM 5		
Input 1	53	335
Input 2	53	220
PSM 6		
PSM 7		
Input 1	53	308
Input 2	53	255

### show chassis power detail (PTX5000 Packet Transport Router)

```
user@host> show chassis power detail
```

Chassis Power	Input(V)	Used(W)
Total Power		3997
PDU 0		1975

PSM 0		
Input 1	54	136
PSM 1		
Input 1	54	377
PSM 2		
Input 1	54	741
PSM 3		
Input 1	54	721
PDU 1		2022
PSM 0		
Input 1	54	235
PSM 1		
Input 1	54	332
PSM 2		
Input 1	54	726
PSM 3		
Input 1	54	729
Item	Used(W)	
Fan Tray 0	49	
Fan Tray 1	127	
Fan Tray 2	117	
RE0/CB0	109	
RE1/CB1	100	
SIB/CCG/FPD	375	
FPC 0	381	
FPC 1	0	
FPC 2	447	
FPC 3	560	
FPC 4	0	
FPC 5	448	
FPC 6	379	
FPC 7	388	

#### show chassis power detail (PTX5000 Packet Transport Router with FPC2-PTX-P1A)

```
user@host> show chassis power detail
```

Chassis Power	Input(V)	Used(W)
Total Power		4394
PDU 0		2095
PSM 0		
Input 1	53	222
Input 2	53	368
PSM 1		
PSM 2		
Input 1	53	248
Input 2	53	329
PSM 3		
PSM 4		
Input 1	53	212
Input 2	53	248
PSM 5		
PSM 6		
Input 1	53	206
Input 2	53	262
PSM 7		



PDU 1		2299
PSM 0		
PSM 1		
Input 1	53	296
Input 2	53	260
PSM 2		
PSM 3		
Input 1	53	309
Input 2	53	315
PSM 4		
PSM 5		
Input 1	53	342
Input 2	53	214
PSM 6		
PSM 7		
Input 1	53	308
Input 2	53	255
Item	Used(W)	
Fan Trays	252	
RE0/CB0	93	
RE1/CB1	92	
SIB	360	
FPC 0	369	
PIC 0	16	
PIC 1	0	
FPC 1	0	
FPC 2	437	
PIC 0	44	
PIC 1	38	
FPC 3	740	
PIC 0	41	
PIC 1	46	
FPC 4	732	
PIC 0	74	
PIC 1	37	
FPC 5	0	
FPC 6	0	
FPC 7	0	

#### show chassis power detail (PTX10008 Router)

```
user@host> show chassis power detail
```

##### PEM 0:

```
State:      Online
Capacity:   2700 W (maximum 2700 W)
AC input:   OK (No feed expected, Both feed connected)
DC output:  1164 W (zone 0, 97 A at 12 V, 43% of capacity)
```

##### PEM 1:

```
State:      Online
Capacity:   2700 W (maximum 2700 W)
AC input:   OK (Both feed expected, Both feed connected)
DC output:  1188 W (zone 0, 99 A at 12 V, 44% of capacity)
```

##### PEM 2:

```
State:      Online
```

```

Capacity: 2700 W (maximum 2700 W)
AC input: OK (No feed expected, Both feed connected)
DC output: 1188 W (zone 0, 99 A at 12 V, 44% of capacity)

PEM 3:
  State: Empty
  Input: Absent

PEM 4:
  State: Empty
  Input: Absent

PEM 5:
  State: Empty
  Input: Absent

System:
  Zone 0:
    Capacity: 8100 W (maximum 8100 W)
    Allocated power: 7160 W (940 W remaining)
    Actual usage: 3540 W
    Total system capacity: 8100 W (maximum 8100 W)
    Total remaining power: 940 W

Item                Used(W)
Fan Tray 0           475
Fan Tray 1           475
RE0/CB0              42
RE1/CB1              46

```

### show chassis power detail (PTX10016 Router)

```
user@host> show chassis power detail
```

```

PEM 0:
  State: Online
  Capacity: 2500 W (maximum 2500 W)
  DC input: OK (Both feed expected, Both feed connected)
  DC output: 432 W (zone 0, 36 A at 12 V, 17% of capacity)

PEM 1:
  State: Online
  Capacity: 2500 W (maximum 2500 W)
  DC input: OK (Both feed expected, Both feed connected)
  DC output: 456 W (zone 0, 38 A at 12 V, 18% of capacity)

PEM 2:
  State: Online
  Capacity: 2500 W (maximum 2500 W)
  DC input: OK (Both feed expected, Both feed connected)
  DC output: 432 W (zone 0, 36 A at 12 V, 17% of capacity)

PEM 3:
  State: Online
  Capacity: 2500 W (maximum 2500 W)
  DC input: OK (Both feed expected, Both feed connected)
  DC output: 432 W (zone 0, 36 A at 12 V, 17% of capacity)

```

```

PEM 4:
  State:      Online
  Capacity:   2500 W (maximum 2500 W)
  DC input:   OK (INP2 feed expected, INP2 feed connected)
  DC output:  432 W (zone 0, 36 A at 12 V, 17% of capacity)

PEM 5:
  State:      Online
  Capacity:   2500 W (maximum 2500 W)
  DC input:   OK (INP2 feed expected, INP2 feed connected)
  DC output:  432 W (zone 0, 36 A at 12 V, 17% of capacity)

PEM 6:
  State:      Online
  Capacity:   2500 W (maximum 2500 W)
  DC input:   OK (INP2 feed expected, INP2 feed connected)
  DC output:  420 W (zone 0, 35 A at 12 V, 16% of capacity)

PEM 7:
  State:      Online
  Capacity:   2500 W (maximum 2500 W)
  DC input:   OK (INP2 feed expected, INP2 feed connected)
  DC output:  432 W (zone 0, 36 A at 12 V, 17% of capacity)

PEM 8:
  State:      Online
  Capacity:   2500 W (maximum 2500 W)
  DC input:   OK (INP2 feed expected, INP2 feed connected)
  DC output:  432 W (zone 0, 36 A at 12 V, 17% of capacity)

PEM 9:
  State:      Online
  Capacity:   2500 W (maximum 2500 W)
  DC input:   OK (INP2 feed expected, INP2 feed connected)
  DC output:  420 W (zone 0, 35 A at 12 V, 16% of capacity)

System:
  Zone 0:
    Capacity:      25000 W (maximum 25000 W)
    Allocated power: 9550 W (15450 W remaining)
    Actual usage:   4320 W
    Total system capacity: 25000 W (maximum 25000 W)
    Total remaining power: 15450 W

Item                Used(W)
Fan Tray 0          975
Fan Tray 1          975
RE0/CB0              42
RE1/CB1              46

```

### show chassis power detail (EX9208 Switch)

```
user@host> show chassis power detail
```

```

PEM 0:
  State:      Present
  AC input:   Out of range (1 feed expected, 1 feed connected)
  Capacity:   2050 W (maximum 2050 W)
  DC output:  0 W (zone 0, 0 A at 0 V, 0% of capacity)

```

```
PEM 1:
  State:    Present
  AC input: Out of range (1 feed expected, 1 feed connected)
  Capacity: 2050 W (maximum 2050 W)
  DC output: 0 W (zone 0, 0 A at 0 V, 0% of capacity)

PEM 2:
  State:    Present
  AC input: Out of range (1 feed expected, 1 feed connected)
  Capacity: 2050 W (maximum 2050 W)
  DC output: 0 W (zone 0, 0 A at 0 V, 0% of capacity)

PEM 3:
  State:    Online
  AC input: OK (1 feed expected, 1 feed connected)
  Capacity: 2050 W (maximum 2050 W)
  DC output: 754 W (zone 0, 13 A at 58 V, 36% of capacity)

System:
  Zone 0:
    Capacity:      2050 W (maximum 2050 W)
    Allocated power: 1478 W (572 W remaining)
    Actual usage:   754 W
    Total system capacity: 2050 W (maximum 2050 W)
    Total remaining power: 572 W
```

#### show chassis power detail (EX9253 Switch)

```
user@switch> show chassis power detail

PEM 0:
  State:    Online
  Capacity: 1600 W (maximum 1600 W)
  AC input: OK (1 feed expected, 1 feed connected)
  DC output: 564 W (zone 0, 47 A at 12 V, 35% of capacity)

PEM 1:
  State:    Present
  Input:    Absent

PEM 2:
  State:    Empty
  Input:    Absent

PEM 3:
  State:    Empty
  Input:    Absent

PEM 4:
  State:    Present
  Input:    Absent

PEM 5:
  State:    Online
  Capacity: 1600 W (maximum 1600 W)
  AC input: OK (1 feed expected, 1 feed connected)
  DC output: 612 W (zone 0, 51 A at 12 V, 38% of capacity)

System:
  Zone 0:
```

```
Capacity:          3200 W (maximum 3200 W)
Allocated power:   2157 W (1043 W remaining)
Actual usage:      1176 W
Total system capacity: 3200 W (maximum 3200 W)
Total remaining power: 1043 W
```

Item	Used(W)
FPC 0	555
FPC 1	543
Fan Tray 0	12
Fan Tray 1	13
Fan Tray 2	12
Fan Tray 3	12
RE0/CB0	55

## show chassis power sequence

<b>Syntax</b>	show chassis power sequence
<b>Release Information</b>	<p>Command introduced in Junos OS Release 10.0.</p> <p>Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.</p>
<b>Description</b>	<p>(MX Series 5G Universal Routing Platforms only) Show power-on sequence for the chassis Dense Port Concentrators (DPCs).</p> <p>(PTX Series Packet Transport Routers, MX2010 and MX2020 routers only) Show power-on sequence for FPCs installed in the chassis.</p>
<b>Options</b>	This command has no options.
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">show chassis power on page 2047</a></li> </ul>
<b>List of Sample Output</b>	<p><a href="#">show chassis power sequence (MX Series) on page 2076</a></p> <p><a href="#">show chassis power sequence (MX2010 Routers) on page 2077</a></p> <p><a href="#">show chassis power sequence (MX2020 Routers) on page 2077</a></p> <p><a href="#">show chassis power sequence (PTX5000 Packet Transport Router) on page 2077</a></p>
<b>Output Fields</b>	<p><a href="#">Table 153 on page 2076</a> lists the output fields for the <b>show chassis power sequence</b> command. Output fields are listed in the approximate order in which they appear.</p>

*Table 153: show chassis power sequence Output Fields*

Field Name	Field Description
<b>Chassis FRU Power Sequence</b>	<p>(MX Series) Power-on sequence for the DPCs in the chassis. The numbers indicate the slot number of the DPCs.</p> <p>(PTX Series, MX2010 and MX2020 routers only) Power-on sequence for the FPCs in the chassis. The numbers indicate the slot number of the FPC.</p>

## Sample Output

### show chassis power sequence (MX Series)

```
user@host> show chassis power sequence
Chassis FRU Power Sequence: 3 4 5 6 7 8 9 10 11 0 1 2
```

**show chassis power sequence (MX2010 Routers)**

```
user@host > show chassis power sequence
Chassis FRU Power On Sequence: 0 1 2 3 4 5 6 7 8 9
```

**show chassis power sequence (MX2020 Routers)**

```
user@host > show chassis power sequence
Chassis FRU Power On Sequence: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
```

**show chassis power sequence (PTX5000 Packet Transport Router)**

```
user@host> show chassis power sequence
Chassis FRU Power On Sequence: 0 1 2 3 4 5 6 7
```

## show chassis psd

**Syntax** `show chassis psd`

**Release Information** Command introduced in Junos OS Release 9.1.

**Description** (Root System Domain [RSD] only) Display information about Protected System Domains (PSDs). A PSD is initially created by the RSD configuration. An RSD and PSDs are supported on a T320 or T640 router, or a T1600 routing node, or a TX Matrix Plus Platform that is interconnected with the JCS1200 platform.



**NOTE:** RSD configuration is not supported on a routing matrix based on TX Matrix Plus router with 3D SIBs.

**Options** This command has no options.

**Additional Information** For more information about PSDs, RSDs, and the JCS1200 platform, see the *Junos OS Protected System Domain Feature Guide for Routing Devices*.

**Required Privilege Level** view

**List of Sample Output** [show chassis psd on page 2079](#)

**Output Fields** [Table 154 on page 2078](#) lists the output fields for the `show chassis psd` command. Output fields are listed in the approximate order in which they appear.

*Table 154: show chassis psd Output Fields*

Field Name	Field Description
Slot Description	PSD identification.
State	PSD status: <ul style="list-style-type: none"> <li>• <b>Online</b>—PSD is online and running.</li> <li>• <b>Offline</b>—PSD is powered down.</li> </ul>
Uptime	Length of time that the PSD has been up and running.



## Sample Output

show chassis psd

```
{master}
```

```
user@host> show chassis psd
```

Slot	Description	State	Uptime
1		Online	12 hours, 19 minutes, 51 seconds
2		Online	2 hours, 18 minutes, 17 seconds
3		Online	12 hours, 19 minutes, 51 seconds

## show chassis redundancy feb

**Syntax** `show chassis redundancy feb  
<errors>  
<redundancy-group group-name>`

**Release Information** Command introduced in Junos OS Release 8.2.

**Description** (M120 routers only) Display information about the status of configured Forwarding Engine Board (FEB) redundancy groups.

**Options** **none**—Display information about the status of all configured FEB redundancy groups.

**redundancy-group group-name**—(Optional) Display information about the specified configured redundancy group.

**errors**—(Optional) Display information about any errors encountered on the components in configured redundancy groups or on links between a FEB and a Flexible PIC Concentrator (FPC).

**Required Privilege Level** view

**Related Documentation**

- [request chassis redundancy feb slot on page 885](#)
- *Configuring FEB Redundancy on the M120 Router*
- *Understanding Switching Control Board Redundancy*

**List of Sample Output** [show chassis redundancy feb on page 2081](#)  
[show chassis redundancy feb redundancy-group grp1 on page 2081](#)  
[show chassis redundancy feb redundancy-group grp0 errors on page 2082](#)

**Output Fields** [Table 155 on page 2080](#) lists the output fields for the **show chassis redundancy feb** command. Output fields are listed in the approximate order in which they appear.

*Table 155: show chassis redundancy feb Output Fields*

Field name	Field Description
Group	Name of configured redundancy group.
FEB	Slot number of each FEB included in redundancy groups.
State	State of each FEB: <ul style="list-style-type: none"> <li>• <b>Online</b>—FEB is online and running.</li> <li>• <b>Offline</b>—FEB is powered down.</li> </ul>

Table 155: show chassis redundancy feb Output Fields (continued)

Field name	Field Description
Priority	(Standard and <b>redundancy-group</b> option) Status of FEB in the redundancy group: <b>Backup</b> , <b>Primary</b> , <b>Other</b> , or null.
Connected FPCs	(Standard and <b>redundancy-group</b> option) Slot number of each FPC connected to the FEB. The status <b>Check</b> is displayed when an error might have occurred.
Redundancy State	(Standard and <b>redundancy-group</b> option) Status of the FEB: <ul style="list-style-type: none"> <li>• <b>Active</b>—FEB is currently active.</li> <li>• <b>Ready</b>—Backup FEB is ready for a switchover</li> <li>• <b>Not Ready</b>—Backup FEB is not ready for a switchover.</li> </ul>
Auto-failover	(Standard and <b>redundancy-group</b> option) Automatic failover status of redundancy group: <b>Enabled</b> or <b>Disabled</b> .
Switch-reason	(Standard and <b>redundancy-group</b> option) Reason a switchover occurred to the backup FEB in the redundancy group.
Hard error: Yes	( <b>errors</b> option only) Displayed when a hard error occurs on a FEB.
FPC	( <b>errors</b> option only) Slot number and status of FPC: <b>link ok</b> or <b>link error</b> .
Fabric plane	( <b>errors</b> option only) Slot number and status of fabric plane.

## Sample Output

### show chassis redundancy feb

```

user@host> show chassis redundancy feb
Group:          cfpc
FEB  State      Priority  Connected FPCs  Redundancy state
0    Offline    Backup
1    Online      5          Active
Auto-failover: Enabled
Group:          grp0
FEB  State      Priority  Connected FPCs  Redundancy state
3    Offline    Backup
5    Online      Primary  0              Active
Auto-failover: Enabled

```

### show chassis redundancy feb redundancy-group grp1

```

user@host> show chassis redundancy feb redundancy-group grp1
Group:          grp1
FEB  State      Priority  Connected FPCs  Redundancy state
0    Online     Other    0              Active
1    Online     Other    1              Active
4    Online     Primary  4              Active
5    Online     Backup   0              Ready

```

```
Autofailover: Enabled
Switch-reason: Switchover from CLI
```

### show chassis redundancy feb redundancy-group grp0 errors

```
user@host> show chassis redundancy feb redundancy-group grp0 errors
```

```
Group: grp0
FEB: 0    State: Online
  FPC 0 link OK
  Fabric plane 0 OK
  Fabric plane 1 OK
  Fabric plane 2 OK
  Fabric plane 3 OK
FEB: 1    State: Online
  FPC 0 link OK
  Fabric plane 0 OK
  Fabric plane 1 OK
  Fabric plane 2 OK
  Fabric plane 3 OK
FEB: 2    State: Online
  FPC 2 link OK
  Fabric plane 0 OK
  Fabric plane 1 OK
  Fabric plane 2 OK
  Fabric plane 3 OK
FEB: 3    State: Online
  FPC 3 link OK
  Fabric plane 0 OK
  Fabric plane 1 OK
  Fabric plane 2 OK
  Fabric plane 3 OK
FEB: 4    State: Online
  FPC 4 link OK
  Fabric plane 0 OK
  Fabric plane 1 OK
  Fabric plane 2 OK
  Fabric plane 3 OK
FEB: 5    State: Online
  FPC 5 link OK
  Fabric plane 0 OK
  Fabric plane 1 OK
  Fabric plane 2 OK
  Fabric plane 3 OK
```

## show chassis routing-engine

- List of Syntax**
- Syntax on page 2083
  - Syntax (ACX Series Universal Metro Routers) on page 2083
  - Syntax (EX Series Switches) on page 2083
  - Syntax (QFX Series) on page 2083
  - Syntax (MX Series Routers) on page 2083
  - Syntax (MX2010 Universal Routing Platforms) on page 2083
  - Syntax (MX2020 Universal Routing Platforms) on page 2084
  - Syntax (MX104 Universal Routing Platforms) on page 2084
  - Syntax (MX204 and MX10003 Universal Routing Platforms) on page 2084
  - Syntax (PTX Series Packet Transport Routers) on page 2084
  - Syntax (T Series Routers) on page 2084
  - Syntax (TX Matrix Routers) on page 2084
  - Syntax (TX Matrix Plus Routers) on page 2084

**Syntax** show chassis routing-engine  
<bios | *slot*>

**Syntax (ACX Series Universal Metro Routers)** show chassis routing-engine

**Syntax (EX Series Switches)** show chassis routing-engine  
<*slot*>  
<satellite [*slot-id slot-id* | device-alias *alias-name*]>

**Syntax (QFX Series)** show chassis routing-engine  
<interconnect-device *name*>  
<node-device *name*>  
<*slot*>  
<*bios*>  
<*errors*>

**Syntax (MX Series Routers)** show chassis routing-engine  
<all-members>  
<bios | *slot*>  
<local>  
<member *member-id*>  
<satellite [*slot-id slot-id* | device-alias *alias-name*]>

**Syntax (MX2010 Universal Routing Platforms)** show chassis routing-engine  
<bios | *slot*>

Syntax (MX2020 Universal Routing Platforms)	show chassis routing-engine <bios   <i>slot</i> >
Syntax (MX104 Universal Routing Platforms)	show chassis routing-engine
Syntax (MX204 and MX10003 Universal Routing Platforms)	show chassis routing-engine < <i>slot</i> > <bios> <errors>
Syntax (PTX Series Packet Transport Routers)	show chassis routing-engine
Syntax (T Series Routers)	show chassis routing-engine <bios   <i>slot</i> >
Syntax (TX Matrix Routers)	show chassis routing-engine <bios   <i>slot</i> > <lcc <i>number</i>   scc>
Syntax (TX Matrix Plus Routers)	show chassis routing-engine <bios   <i>slot</i> > <lcc <i>number</i>   sfc <i>number</i> >
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p> <p><b>sfc</b> option introduced in Junos OS Release in 9.6 for the TX Matrix Plus router.</p> <p>Command introduced in Junos OS Release 11.1 for QFX Series.</p> <p><b>5 sec CPU Utilization, 1 min CPU Utilization, 5 min CPU Utilization, and 15 min CPU Utilization</b> output fields introduced in Junos OS Release 11.3R1.</p> <p>Command introduced in Junos OS Release 12.2 for ACX Series Universal Metro Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 and MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 13.2 for MX104 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> <p><b>satellite</b> option introduced in Junos OS Release 14.2R3.</p> <p>Command introduced in Junos OS Release 17.2 for PTX10008 Routers.</p> <p>Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 17.4 for MX204 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 18.1R1 for EX9251 switches.</p>

**Description** Display the status of the Routing Engine.

**Options** **none**—Display information about one or more Routing Engines. On a TX Matrix router, display information about all Routing Engines on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display information about all Routing Engines on the TX Matrix Plus router and its attached routers.

**all-members**—(MX Series routers only) (Optional) Display Routing Engine information for all members of the Virtual Chassis configuration.

**bios**—(Optional) Display the (BIOS) firmware version.

**errors**—(Optional) Display routing engine errors.

**interconnect-device *number***—(QFabric systems only) (Optional) Display Routing Engine information for a specified Interconnect device.

**lcc *number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display Routing Engine information for a specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display Routing Engine information for a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers only) (Optional) Display Routing Engine information for the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Display Routing Engine information for the specified member of the Virtual Chassis configuration. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

**node-device *number***—(QFabric systems only) (Optional) Display Routing Engine information for a specified Node device.

**satellite [*slot-id slot-id* [*device-alias alias-name*]]**—(Junos Fusion only) (Optional) Display Routing Engine information for the specified satellite device in a Junos Fusion, or for all satellite devices in the Junos Fusion if no satellite devices are specified.

**scc**—(TX Matrix routers only) (Optional) Display Routing Engine information for the TX Matrix router (switch-card chassis).

**sfc number**—(TX Matrix Plus routers only) (Optional) Display Routing Engine information for the TX Matrix Plus router (or switch-fabric chassis). Replace **number** with 0.

**slot**—(Systems with multiple Routing Engines) (Optional) Display information for an individual Routing Engine. Replace **slot** with 0 or 1. For QFX3500 switches, there is only one Routing Engine, so you do not need to specify the slot number.

**Required Privilege Level**

view

**Related Documentation**

- [request chassis routing-engine master on page 886](#)
- [Configuring Routing Engine Redundancy](#)
- [Switching the Global Master and Backup Roles in a Virtual Chassis Configuration](#)

**List of Sample Output**

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[show chassis routing-engine \(M10 Router\) on page 2090](#)  
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[show chassis routing-engine](#) (Displaying the guest reboot reason on PTX5000, MX240, MX480, MX960 < MX2010, and MX2020) on page 2112

**Output Fields** [Table 156 on page 2087](#) lists the output fields for the **show chassis routing-engine** command. Output fields are listed in the approximate order in which they appear.

*Table 156: show chassis routing-engine Output Fields*

Field Name	Field Description
<b>Slot</b>	(Systems with single and multiple Routing Engines) Slot number.
<b>Current state</b>	(Systems with multiple Routing Engines) Current state of the Routing Engine: <b>Master</b> , <b>Backup</b> , or <b>Disabled</b> .
<b>Election priority</b>	(Systems with multiple Routing Engines) Election priority for the Routing Engine: <b>Master</b> or <b>Backup</b> .
<b>Temperature</b>	Temperature of the air flowing past the Routing Engine.
<b>CPU Temperature</b>	Temperature of the CPU.
<b>DRAM</b>	Total DRAM available to the Routing Engine's processor.  Starting with Junos OS Release 12.3R1, the DRAM field displays both available memory and installed memory.
<b>Memory utilization</b>	Percentage of Routing Engine memory being used.  <b>NOTE:</b> For platforms running Junos OS with upgraded FreeBSD, the way memory utilization is calculated has changed. Starting in Junos OS Release 15.1R1, inactive memory is no longer included in the calculation for memory utilization. Inactive memory is now considered as free. That is, the value for used memory decreases and results in more memory to be available for other processes. For platforms that run Junos OS with upgraded FreeBSD, see <i>Release Information for Junos OS with Upgraded FreeBSD</i> .
<b>CPU utilization</b>	Information about the Routing Engine's CPU utilization: <ul style="list-style-type: none"> <li>• <b>User</b>—Percentage of CPU time being used by user processes.</li> <li>• <b>Background</b>—Percentage of CPU time being used by background processes.</li> <li>• <b>Kernel</b>—Percentage of CPU time being used by kernel processes.</li> <li>• <b>Interrupt</b>—Percentage of CPU time being used by interrupts.</li> <li>• <b>Idle</b>—Percentage of CPU time that is idle.</li> </ul>
<b>5 sec CPU Utilization</b>	Information about the Routing Engine's CPU utilization in the past 5 seconds: <ul style="list-style-type: none"> <li>• <b>User</b>—Percentage of CPU time being used by user processes.</li> <li>• <b>Background</b>—Percentage of CPU time being used by background processes.</li> <li>• <b>Kernel</b>—Percentage of CPU time being used by kernel processes.</li> <li>• <b>Interrupt</b>—Percentage of CPU time being used by interrupts.</li> <li>• <b>Idle</b>—Percentage of CPU time that is idle.</li> </ul>

Table 156: show chassis routing-engine Output Fields (continued)

Field Name	Field Description
<b>1 min CPU Utilization</b>	Information about the Routing Engine's CPU utilization in the past 1 minute: <ul style="list-style-type: none"> <li>• <b>User</b>—Percentage of CPU time being used by user processes.</li> <li>• <b>Background</b>—Percentage of CPU time being used by background processes.</li> <li>• <b>Kernel</b>—Percentage of CPU time being used by kernel processes.</li> <li>• <b>Interrupt</b>—Percentage of CPU time being used by interrupts.</li> <li>• <b>Idle</b>—Percentage of CPU time that is idle.</li> </ul>
<b>5 min CPU Utilization</b>	Information about the Routing Engine's CPU utilization in the past 5 minutes: <ul style="list-style-type: none"> <li>• <b>User</b>—Percentage of CPU time being used by user processes.</li> <li>• <b>Background</b>—Percentage of CPU time being used by background processes.</li> <li>• <b>Kernel</b>—Percentage of CPU time being used by kernel processes.</li> <li>• <b>Interrupt</b>—Percentage of CPU time being used by interrupts.</li> <li>• <b>Idle</b>—Percentage of CPU time that is idle.</li> </ul>
<b>15 min CPU Utilization</b>	Information about the Routing Engine's CPU utilization in the past 15 minutes: <ul style="list-style-type: none"> <li>• <b>User</b>—Percentage of CPU time being used by user processes.</li> <li>• <b>Background</b>—Percentage of CPU time being used by background processes.</li> <li>• <b>Kernel</b>—Percentage of CPU time being used by kernel processes.</li> <li>• <b>Interrupt</b>—Percentage of CPU time being used by interrupts.</li> <li>• <b>Idle</b>—Percentage of CPU time that is idle.</li> </ul>
<b>Model</b>	Routing Engine model number.
<b>Serial ID</b>	(Systems with multiple Routing Engines) Identification number of the Routing Engine in this slot.
<b>Start time</b>	Time at which the Routing Engine started running.
<b>Uptime</b>	How long the Routing Engine has been running.
Routing Engine BIOS Version	BIOS version being run by the Routing Engine.

Table 156: show chassis routing-engine Output Fields (continued)

Field Name	Field Description
Last reboot reason	<p>Reason for last reboot, including:</p> <ul style="list-style-type: none"> <li><b>power cycle/failure</b>—Halt of the Routing Engine using the <b>halt</b> command, powering down using the power button on the chassis or any other method (such as removal of the control board or Routing Engine), and then powering back the Routing Engine. A halt of the operating system also occurs if you enter the <b>request system halt</b> command. You can enter this command to halt the system operations on the chassis or specific Routing Engines. To restart the software, press any key on the keyboard.</li> <li><b>watchdog</b>—Reboot due to a hardware watchdog. A watchdog is a hardware monitoring process that examines the health and performance of the router to enable the device to recover from failures. A watchdog checks for problems at certain intervals, and reboots the routing engine if a problem is encountered.</li> <li><b>reset-button reset</b>—(Not available on the EX Series switch) Reboot due to pressing of the reset button on the Routing Engine.</li> <li><b>power-button hard power off</b>—Reboot due to pressing of the power button on the chassis. A powering down of the software also occurs if you enter the <b>request system power-off</b> command. You can enter this command to power down the chassis or specific Routing Engines; you can then restart the software.</li> <li><b>misc hardware reason</b>—Reboot due to miscellaneous hardware reasons.</li> <li><b>thermal shutdown</b>—Reboot due to the router or switch reaching a critical temperature at which point it is unsafe to continue operations.</li> <li><b>hard disk failure</b>—Reboot due to a hard disk or solid-state drive (SSD) failure.</li> <li><b>reset from debugger</b>—Reboot due to reset from the debugger.</li> <li><b>chassis control reset</b>—Restart the chassis process that manages PICs, FPCs, and other hardware components. The chassis control module that runs the Routing Engine performs management and monitoring functions, and it provides a single access point for operational and maintenance functions. A reset of the chassis management process occurs when you enter the <b>restart chassis-control</b> command.</li> <li><b>bios auto recovery reset</b>—Reboot due to a BIOS auto-recovery reset.</li> <li><b>could not be determined</b>—Reboot due to an undetermined reason.</li> <li><b>Router rebooted after a normal shutdown</b>—Reboot due to a normal shutdown. This reason is displayed if the Routing Engine is powered down by pushing and holding the online/offline button on the Routing Engine faceplate for 30 seconds, and then powered back. A reboot of the software also occurs if you enter the <b>request system reboot</b> command. You can enter this command to reboot the chassis or specific Routing Engines.</li> <li><b>Hypervisor reboot</b>—When both Linux host and Junos OS is rebooted using the <b>request vmhost reboot</b> command.</li> <li><b>VJUNOS Reboot</b>—When Junos OS is rebooted using the <b>request system reboot</b> command.</li> </ul>
Load averages	Routing Engine load averages for the last 1, 5, and 15 minutes.

## Sample Output

### show chassis routing-engine (M5 Router)

```

user@host> show chassis routing-engine

Routing Engine status:
  Temperature           25 degrees C / 77 degrees F
  DRAM                   768 MB
  Memory utilization     21 percent

```

```

CPU utilization:
  User          0 percent
  Background    0 percent
  Kernel        0 percent
  Interrupt     0 percent
  Idle          100 percent
Model          RE-2.0
Serial ID      31000007349bf701
Start time     2003-12-04 09:42:17 PST
Uptime         26 days, 1 hour, 12 minutes, 27 seconds
Last reboot reason Router rebooted after a normal shutdown
Load averages: 1 minute  5 minute 15 minute
                  0.00    0.01    0.00

```

### show chassis routing-engine (M10 Router)

```
user@host> show chassis routing-engine
```

```

Routing Engine status:
  Temperature    25 degrees C / 77 degrees F
  DRAM           768 MB
  Memory utilization 21 percent
  CPU utilization:
    User          0 percent
    Background    0 percent
    Kernel        0 percent
    Interrupt     0 percent
    Idle          100 percent
  Model          RE-2.0
  Serial ID      31000007349bf701
  Start time     2003-12-04 09:42:17 PST
  Uptime         26 days, 1 hour, 12 minutes, 27 seconds
  Last reboot reason Router rebooted after a normal shutdown
  Load averages: 1 minute  5 minute 15 minute
                    0.00    0.01    0.00

```

### show chassis routing-engine (M20 Router)

```
user@host> show chassis routing-engine
```

```

Routing Engine status:
  Slot 0:
    Current state      Master
    Election priority  Master (default)
    Temperature        29 degrees C / 84 degrees F
    DRAM               768 MB
    Memory utilization 20 percent
    CPU utilization:
      User              1 percent
      Background        0 percent
      Kernel            2 percent
      Interrupt         0 percent
      Idle              97 percent
    Model              RE-2.0
    Serial ID          58000007348d9a01
    Start time         2003-12-30 07:05:47 PST
    Uptime              3 hours, 41 minutes, 14 seconds
    Last reboot reason Router rebooted after a normal shutdown
    Load averages:    1 minute  5 minute 15 minute

```

```

                                0.00      0.02      0.00
Routing Engine status:
  Slot 1:
    Current state                Backup
    Election priority            Backup (default)
    Temperature                  29 degrees C / 84 degrees F
    DRAM                         768 MB
    Memory utilization           0 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     1 percent
      Interrupt                   0 percent
      Idle                       99 percent
    Model                        RE-2.0
    Serial ID                    d800000734745701
    Start time                   2003-06-17 16:37:33 PDT
    Uptime                       195 days, 18 hours, 47 minutes, 9 seconds
    Last reboot reason           Router rebooted after a normal shutdown

```

### show chassis routing-engine (M40 Router)

```

user@host> show chassis routing-engine
Routing Engine status:
  Temperature                    25 degrees C / 77 degrees F
  DRAM                           768 MB
  Memory utilization              21 percent
  CPU utilization:
    User                         0 percent
    Background                   0 percent
    Kernel                       0 percent
    Interrupt                     0 percent
    Idle                         100 percent
  Model                           RE-2.0
  Serial ID                      31000007349bf701
  Start time                     2003-12-04 09:42:17 PST
  Uptime                         26 days, 1 hour, 12 minutes, 27 seconds
  Last reboot reason              Router rebooted after a normal shutdown
  Load averages:                 1 minute   5 minute  15 minute
                                0.00        0.01      0.00

```

### show chassis routing-engine (M120 Router)

```

user@host> show chassis routing-engine
Routing Engine status:
  Slot 0:
    Current state                Master
    Election priority            Master (default)
    Temperature                  46 degrees C / 114 degrees F
    CPU temperature               44 degrees C / 111 degrees F
    DRAM                         2048 MB
    Memory utilization           18 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     5 percent
      Interrupt                   0 percent

```

```

Idle 95 percent
Model RE-A-1000
Serial ID 1000621154
Start time 2006-10-31 17:10:05 PST
Uptime 14 minutes, 31 seconds
Last reboot reason Router rebooted after a normal shutdown
Load averages: 1 minute 5 minute 15 minute
                0.02      0.07      0.07

Routing Engine status:
Slot 1:
Current state Backup
Election priority Backup (default)
Temperature 45 degrees C / 113 degrees F
CPU temperature 42 degrees C / 107 degrees F
DRAM 2048 MB
Memory utilization 15 percent
CPU utilization:
  User 0 percent
  Background 0 percent
  Kernel 0 percent
  Interrupt 0 percent
  Idle 100 percent
Model RE-A-1000
Serial ID 1000621151
Start time 2006-10-31 17:10:04 PST
Uptime 14 minutes, 30 seconds
Last reboot reason Router rebooted after a normal shutdown

```

### show chassis routing-engine (M160 Router)

```
user@host> show chassis routing-engine
```

```

Routing Engine status:
Slot 0:
Current state Master
Election priority Master (default)
Temperature 43 degrees C / 109 degrees F
DRAM 2048 MB
Memory utilization 11 percent
CPU utilization:
  User 1 percent
  Background 0 percent
  Kernel 2 percent
  Interrupt 0 percent
  Idle 97 percent
Model RE-3.0
Serial ID 210865700403
Start time 2003-12-23 12:25:55 PST
Uptime 6 days, 22 hours, 33 minutes, 24 seconds
Last reboot reason Router rebooted after a normal shutdown
Load averages: 1 minute 5 minute 15 minute
                0.24      0.13      0.04

Routing Engine status:
Slot 1:
Current state Backup
Election priority Backup (default)
Temperature 40 degrees C / 104 degrees F
DRAM 2048 MB
Memory utilization 9 percent
CPU utilization:

```

```

User          0 percent
Background    0 percent
Kernel        0 percent
Interrupt     0 percent
Idle          100 percent
Model         RE-3.0
Serial ID     210865700332
Start time    2003-12-23 12:25:55 PST
Uptime        6 days, 22 hours, 33 minutes, 21 seconds
Last reboot reason Router rebooted after a normal shutdown

```

### show chassis routing-engine (MX104 Router)

```
user@host> show chassis routing-engine
```

#### Routing Engine status:

##### Slot 0:

```

Current state      Master
Election priority  Master (default)
Temperature        32 degrees C / 89 degrees F
CPU temperature    42 degrees C / 107 degrees F
DRAM              3840 MB (3840 MB installed)
Memory utilization 18 percent
CPU utilization:
  User            0 percent
  Background      0 percent
  Kernel          3 percent
  Interrupt       2 percent
  Idle            94 percent
Model             RE-MX-104
Serial ID         CAAR5925
Start time        2013-06-05 13:17:08 IST
Uptime            1 hour, 15 minutes, 8 seconds
Last reboot reason 0x200:normal shutdown
Load averages:    1 minute  5 minute 15 minute
                  0.87      0.90     0.41

```

#### Routing Engine status:

##### Slot 1:

```

Current state      Backup
Election priority  Backup (default)
Temperature        32 degrees C / 89 degrees F
CPU temperature    38 degrees C / 100 degrees F
DRAM              3840 MB (3840 MB installed)
Memory utilization 13 percent
CPU utilization:
  User            0 percent
  Background      0 percent
  Kernel          1 percent
  Interrupt       2 percent
  Idle            97 percent
Model             RE-MX-104
Serial ID         CAAM6369
Start time        2013-06-05 13:07:37 IST
Uptime            1 hour, 24 minutes, 34 seconds
Last reboot reason 0x200:normal shutdown
Load averages:    1 minute  5 minute 15 minute
                  0.19      0.15     0.06

```

**show chassis routing-engine (MX240 Router)**

```
user@host> show chassis routing-engine
```

**Routing Engine status:****Slot 0:**

Current state	Master
Election priority	Master (default)
Temperature	36 degrees C / 96 degrees F
CPU temperature	35 degrees C / 95 degrees F
DRAM	3314 MB (8192 MB installed)
Memory utilization	37 percent
5 sec CPU utilization:	
User	0 percent
Background	0 percent
Kernel	1 percent
Interrupt	0 percent
Idle	99 percent
1 min CPU utilization:	
User	0 percent
Background	0 percent
Kernel	1 percent
Interrupt	0 percent
Idle	99 percent
5 min CPU utilization:	
User	0 percent
Background	0 percent
Kernel	1 percent
Interrupt	0 percent
Idle	99 percent
15 min CPU utilization:	
User	0 percent
Background	0 percent
Kernel	1 percent
Interrupt	0 percent
Idle	99 percent
Model	RE-S-1800x4
Serial ID	9009074155
Start time	2014-10-13 00:35:41 PDT
Uptime	98 days, 2 hours, 6 minutes, 35 seconds
Last reboot reason	Router rebooted after a normal shutdown.
Load averages:	1 minute    5 minute    15 minute
	0.12            0.12            0.13

**Routing Engine status:****Slot 1:**

Current state	Present
---------------	---------

**show chassis routing-engine (MX480 Router)**

```
user@host> show chassis routing-engine
```

**Routing Engine status:****Slot 0:**

Current state	Backup
Election priority	Master (default)
Temperature	30 degrees C / 86 degrees F
CPU temperature	32 degrees C / 89 degrees F
DRAM	3314 MB (8192 MB installed)
Memory utilization	51 percent
5 sec CPU utilization:	



```

User          0 percent
Background    0 percent
Kernel        0 percent
Interrupt     0 percent
Idle          100 percent
1 min CPU utilization:
User          0 percent
Background    0 percent
Kernel        0 percent
Interrupt     0 percent
Idle          0 percent
5 min CPU utilization:
User          0 percent
Background    0 percent
Kernel        0 percent
Interrupt     0 percent
Idle          0 percent
15 min CPU utilization:
User          0 percent
Background    0 percent
Kernel        0 percent
Interrupt     0 percent
Idle          0 percent
Model          RE-S-1800x4
Serial ID      9009079817
Start time     2015-01-19 01:45:58 PST
Uptime         7 minutes, 23 seconds
Last reboot reason Router rebooted after a normal shutdown.
Load averages: 1 minute   5 minute   15 minute
                  0.16      0.16      0.09

Routing Engine status:
Slot 1:
Current state      Master
Election priority   Backup (default)
Temperature         31 degrees C / 87 degrees F
CPU temperature     32 degrees C / 89 degrees F
DRAM                8144 MB (8192 MB installed)
Memory utilization  23 percent
5 sec CPU utilization:
User          0 percent
Background    0 percent
Kernel        1 percent
Interrupt     0 percent
Idle          99 percent
1 min CPU utilization:
User          0 percent
Background    0 percent
Kernel        1 percent
Interrupt     0 percent
Idle          98 percent
5 min CPU utilization:
User          0 percent
Background    0 percent
Kernel        1 percent
Interrupt     0 percent
Idle          98 percent
15 min CPU utilization:
User          0 percent
Background    0 percent
Kernel        1 percent

```

Interrupt	0 percent
Idle	98 percent
Model	RE-S-1800x4
Serial ID	9009079838
Start time	2015-01-09 10:52:20 PST
Uptime	9 days, 15 hours, 1 minute, 4 seconds
Last reboot reason	Router rebooted after a normal shutdown.
Load averages:	1 minute    5 minute    15 minute
	0.10            0.16            0.16

### show chassis routing-engine (MX960 Router)

```
user@host> show chassis routing-engine
```

#### Routing Engine status:

##### Slot 0:

Current state	Master
Election priority	Master (default)
Temperature	37 degrees C / 98 degrees F
CPU temperature	34 degrees C / 93 degrees F
DRAM	3313 MB (16384 MB installed)
Memory utilization	31 percent
5 sec CPU utilization:	
User	0 percent
Background	0 percent
Kernel	3 percent
Interrupt	1 percent
Idle	96 percent
1 min CPU utilization:	
User	0 percent
Background	0 percent
Kernel	4 percent
Interrupt	1 percent
Idle	96 percent
5 min CPU utilization:	
User	0 percent
Background	0 percent
Kernel	4 percent
Interrupt	1 percent
Idle	95 percent
15 min CPU utilization:	
User	0 percent
Background	0 percent
Kernel	4 percent
Interrupt	1 percent
Idle	95 percent
Model	RE-S-1800x4
Serial ID	9013043785
Start time	2015-01-12 23:37:53 PST
Uptime	6 days, 2 hours, 17 minutes, 3 seconds
Last reboot reason	Router rebooted after a normal shutdown.
Load averages:	1 minute    5 minute    15 minute
	0.00            0.02            0.00

#### Routing Engine status:

##### Slot 1:

Current state	Backup
Election priority	Backup (default)
Temperature	37 degrees C / 98 degrees F
CPU temperature	34 degrees C / 93 degrees F
DRAM	3313 MB (16384 MB installed)

```

Memory utilization          26 percent
5 sec CPU utilization:
  User                     0 percent
  Background               0 percent
  Kernel                  0 percent
  Interrupt               0 percent
  Idle                   99 percent
1 min CPU utilization:
  User                     0 percent
  Background               0 percent
  Kernel                  0 percent
  Interrupt               0 percent
  Idle                   0 percent
5 min CPU utilization:
  User                     0 percent
  Background               0 percent
  Kernel                  0 percent
  Interrupt               0 percent
  Idle                   0 percent
15 min CPU utilization:
  User                     0 percent
  Background               0 percent
  Kernel                  0 percent
  Interrupt               0 percent
  Idle                   0 percent
Model                      RE-S-1800x4
Serial ID                  9013037303
Start time                 2015-01-12 23:25:29 PST
Uptime                    6 days, 2 hours, 29 minutes, 21 seconds
Last reboot reason        Router rebooted after a normal shutdown.
Load averages:            1 minute   5 minute   15 minute
                          0.00       0.00       0.00

```

### show chassis routing-engine (MX2010 Router)

```
user@host> show chassis routing-engine
```

```

Routing Engine status:
Slot 0:
  Current state             Master
  Election priority         Master (default)
  Temperature               41 degrees C / 105 degrees F
  CPU temperature           38 degrees C / 100 degrees F
  DRAM                     3313 MB (16384 MB installed)
  Memory utilization        37 percent
  5 sec CPU utilization:
    User                   0 percent
    Background             0 percent
    Kernel                 2 percent
    Interrupt              2 percent
    Idle                  96 percent
  1 min CPU utilization:
    User                   0 percent
    Background             0 percent
    Kernel                 2 percent
    Interrupt              2 percent
    Idle                  97 percent
  5 min CPU utilization:
    User                   0 percent
    Background             0 percent

```

```

Kernel                2 percent
Interrupt              2 percent
Idle                  97 percent
15 min CPU utilization:
User                  0 percent
Background             0 percent
Kernel                2 percent
Interrupt              2 percent
Idle                  97 percent
Model                 RE-S-1800x4
Serial ID              9009146890
Start time             2015-01-18 21:35:12 PST
Uptime                4 hours, 21 minutes, 34 seconds
Last reboot reason     Router rebooted after a normal shutdown.
Load averages:         1 minute  5 minute 15 minute
                       0.11      0.14     0.14

```

### show chassis routing-engine (MX2020 Router)

```
user@host> show chassis routing-engine
```

```

Routing Engine status:
Slot 0:
  Current state           Master
  Election priority       Master (default)
  Temperature             2 degrees C / 35 degrees F
  CPU temperature         32 degrees C / 89 degrees F
  DRAM                   32735 MB (32768 MB installed)
  Memory utilization      10 percent
  5 sec CPU utilization:
    User                  0 percent
    Background            0 percent
    Kernel                1 percent
    Interrupt             1 percent
    Idle                  98 percent
  1 min CPU utilization:
    User                  0 percent
    Background            0 percent
    Kernel                1 percent
    Interrupt             1 percent
    Idle                  99 percent
  5 min CPU utilization:
    User                  0 percent
    Background            0 percent
    Kernel                1 percent
    Interrupt             1 percent
    Idle                  99 percent
  15 min CPU utilization:
    User                  0 percent
    Background            0 percent
    Kernel                1 percent
    Interrupt             1 percent
    Idle                  99 percent
  Model                 RE-S-2X00x8
  Serial ID              CADN0309
  Start time             2015-01-08 16:31:15 PST
  Uptime                 4 days, 22 hours, 59 minutes, 3 seconds
  Last reboot reason     Router rebooted after a normal shutdown.
  Load averages:         1 minute  5 minute 15 minute
                       0.39      0.41     0.34

```

## show chassis routing-engine (MX10003 Router)

```
user@host> show chassis routing-engine
```

## Routing Engine status:

## Slot 0:

Current state	Master
Election priority	Master (default)
Temperature	43 degrees C / 109 degrees F
CPU temperature	40 degrees C / 104 degrees F
DRAM	49112 MB (49152 MB installed)
Memory utilization	4 percent
5 sec CPU utilization:	
User	0 percent
Background	0 percent
Kernel	2 percent
Interrupt	0 percent
Idle	98 percent
1 min CPU utilization:	
User	0 percent
Background	0 percent
Kernel	1 percent
Interrupt	0 percent
Idle	98 percent
5 min CPU utilization:	
User	0 percent
Background	0 percent
Kernel	1 percent
Interrupt	0 percent
Idle	98 percent
15 min CPU utilization:	
User	0 percent
Background	0 percent
Kernel	1 percent
Interrupt	0 percent
Idle	96 percent
Model	RE-S-2X00x6
Start time	2017-08-08 23:13:16 PDT
Uptime	53 minutes, 38 seconds
Last reboot reason	0x1:power cycle/failure
Load averages:	1 minute    5 minute    15 minute
	0.23        0.28        0.25

## Routing Engine status:

## Slot 1:

Current state	Backup
Election priority	Backup (default)
Temperature	38 degrees C / 100 degrees F
CPU temperature	39 degrees C / 102 degrees F
DRAM	49112 MB (49152 MB installed)
Memory utilization	4 percent
5 sec CPU utilization:	
User	0 percent
Background	0 percent
Kernel	1 percent
Interrupt	0 percent
Idle	99 percent
Model	RE-S-2X00x6
Start time	2017-08-08 23:13:18 PDT
Uptime	53 minutes, 25 seconds

Last reboot reason	0x1:power cycle/failure		
Load averages:	1 minute	5 minute	15 minute
	0.21	0.19	0.17

### show chassis routing-engine (MX204 Router)

```
user@host> show chassis routing-engine
```

```
Routing Engine status:
  Temperature           52 degrees C / 125 degrees F
  CPU temperature        52 degrees C / 125 degrees F
  DRAM                   16341 MB (16384 MB installed)
  Memory utilization     11 percent
  5 sec CPU utilization:
    User                 0 percent
    Background           0 percent
    Kernel               0 percent
    Interrupt            0 percent
    Idle                 100 percent
  1 min CPU utilization:
    User                 0 percent
    Background           0 percent
    Kernel               0 percent
    Interrupt            0 percent
    Idle                 100 percent
  5 min CPU utilization:
    User                 0 percent
    Background           0 percent
    Kernel               0 percent
    Interrupt            0 percent
    Idle                 100 percent
  15 min CPU utilization:
    User                 0 percent
    Background           0 percent
    Kernel               0 percent
    Interrupt            0 percent
    Idle                 100 percent
  Model                  RE-S-2X00x6
  Start time             2017-11-04 00:30:31 PDT
  Uptime                 4 days, 7 hours, 17 minutes, 3 seconds
  Last reboot reason     0x1:power cycle/failure
  Load averages:        1 minute   5 minute   15 minute
                        0.17       0.12      0.13
```

### show chassis routing-engine (T320 Router)

```
user@host> show chassis routing-engine
```

```
Slot 0:
  Current state          Master
  Election priority      Master (default)
  Temperature            51 degrees C / 123 degrees F
  CPU temperature        55 degrees C / 131 degrees F
  DRAM                   3584 MB
  Memory utilization     11 percent
  CPU utilization:
    User                 0 percent
    Background           0 percent
```

```

Kernel                2 percent
Interrupt              0 percent
Idle                  97 percent
Model                 RE-A-2000
Serial ID              9009010618
Start time             2012-10-10 01:24:05 PDT
Uptime                 5 days, 10 hours, 49 minutes, 23 seconds
Last reboot reason     0x1:power cycle/failure
Load averages:         1 minute   5 minute  15 minute
                       0.00       0.05    0.04

```

#### Routing Engine status:

##### Slot 1:

```

Current state          Backup
Election priority      Backup (default)
Temperature             45 degrees C / 113 degrees F
CPU temperature         48 degrees C / 118 degrees F
DRAM                   3584 MB
Memory utilization      9 percent
CPU utilization:
  User                  0 percent
  Background            0 percent
  Kernel                0 percent
  Interrupt              0 percent
  Idle                  100 percent
Model                  RE-A-2000
Serial ID               9009003642
Start time              2012-10-10 01:24:04 PDT
Uptime                  5 days, 10 hours, 49 minutes, 28 seconds
Last reboot reason      0x1:power cycle/failure

```

### show chassis routing-engine (T640 Router)

```
user@host> show chassis routing-engine
```

#### Routing Engine status:

##### Slot 0:

```

Current state          Master
Election priority      Master (default)
Temperature             50 degrees C / 122 degrees F
CPU temperature         58 degrees C / 136 degrees F
DRAM                   3584 MB
Memory utilization      14 percent
CPU utilization:
  User                  1 percent
  Background            0 percent
  Kernel                4 percent
  Interrupt              1 percent
  Idle                  95 percent
Model                  RE-A-2000
Serial ID               1000686556
Start time              2012-10-10 01:24:02 PDT
Uptime                  5 days, 10 hours, 50 minutes, 27 seconds
Last reboot reason      0x1:power cycle/failure
Load averages:         1 minute   5 minute  15 minute
                       1.24       0.33    0.12

```

#### Routing Engine status:

##### Slot 1:

```

Current state          Backup
Election priority      Backup (default)
Temperature             44 degrees C / 111 degrees F

```

```

CPU temperature      49 degrees C / 120 degrees F
DRAM                 3584 MB
Memory utilization    12 percent
CPU utilization:
  User                0 percent
  Background          0 percent
  Kernel              0 percent
  Interrupt            1 percent
  Idle                99 percent
Model                RE-A-2000
Serial ID             1000702739
Start time            2012-10-10 01:24:02 PDT
Uptime                5 days, 10 hours, 50 minutes, 26 seconds
Last reboot reason    0x1:power cycle/failure

```

### show chassis routing-engine (TI600 Router)

```
user@host> show chassis routing-engine
```

#### Routing Engine status:

##### Slot 0:

```

Current state        Master
Election priority     Master (default)
Temperature           48 degrees C / 118 degrees F
CPU temperature       58 degrees C / 136 degrees F
DRAM                 3584 MB
Memory utilization    13 percent
CPU utilization:
  User                0 percent
  Background          0 percent
  Kernel              3 percent
  Interrupt            1 percent
  Idle                96 percent
Model                RE-A-2000
Serial ID             1000704521
Start time            2012-10-10 01:23:41 PDT
Uptime                5 days, 10 hours, 46 minutes, 56 seconds
Last reboot reason    0x1:power cycle/failure
Load averages:        1 minute   5 minute   15 minute
                      0.05       0.03       0.01

```

#### Routing Engine status:

##### Slot 1:

```

Current state        Backup
Election priority     Backup (default)
Temperature           44 degrees C / 111 degrees F
CPU temperature       48 degrees C / 118 degrees F
DRAM                 3584 MB
Memory utilization    12 percent
CPU utilization:
  User                0 percent
  Background          0 percent
  Kernel              0 percent
  Interrupt            0 percent
  Idle                100 percent
Model                RE-A-2000
Serial ID             9009006579
Start time            2012-10-10 01:23:42 PDT
Uptime                5 days, 10 hours, 46 minutes, 54 seconds
Last reboot reason    0x1:power cycle/failure

```



**show chassis routing-engine (T4000 Router)**

```
user@host> show chassis routing-engine
```

**Routing Engine status:****Slot 0:**

```

Current state           Master
Election priority       Master (default)
Temperature             33 degrees C / 91 degrees F
CPU temperature         50 degrees C / 122 degrees F
DRAM                   8960 MB
Memory utilization      18 percent
CPU utilization:
  User                  0 percent
  Background            0 percent
  Kernel                4 percent
  Interrupt             1 percent
  Idle                  95 percent
Model                  RE-DUO-1800
Serial ID               P737F-002248
Start time              2012-02-09 22:49:53 PST
Uptime                  2 hours, 21 minutes, 35 seconds
Last reboot reason      Router rebooted after a normal shutdown.
Load averages:          1 minute   5 minute  15 minute
                        0.00        0.04    0.00

```

**Routing Engine status:****Slot 1:**

```

Current state           Backup
Election priority       Backup (default)
Temperature             32 degrees C / 89 degrees F
CPU temperature         46 degrees C / 114 degrees F
DRAM                   8960 MB
Memory utilization      24 percent
CPU utilization:
  User                  0 percent
  Background            0 percent
  Kernel                0 percent
  Interrupt             0 percent
  Idle                  99 percent
Model                  RE-DUO-1800
Serial ID               P737F-002653
Start time              2012-02-08 20:12:51 PST
Uptime                  1 day, 4 hours, 58 minutes, 28 seconds
Last reboot reason      Router rebooted after a normal shutdown.

```

**show chassis routing-engine (TX Matrix Router)**

```
user@host> show chassis routing-engine
```

```
scc-re0:
```

**Routing Engine status:****Slot 0:**

```

Current state           Master
Election priority       Master (default)
Temperature             34 degrees C / 93 degrees F
CPU temperature         33 degrees C / 91 degrees F
DRAM                   2048 MB
Memory utilization      12 percent
CPU utilization:

```

```

User          0 percent
Background    0 percent
Kernel        2 percent
Interrupt     0 percent
Idle          98 percent
Model         RE-4.0
Serial ID     P11123900153
Start time    2004-08-05 18:42:05 PDT
Uptime        9 days, 22 hours, 49 minutes, 50 seconds
Last reboot reason Router rebooted after a normal shutdown
Load averages: 1 minute   5 minute   15 minute
                  0.00      0.08      0.07

```

1cc0-re0:

-----  
Routing Engine status:

```

Slot 0:
  Current state      Master
  Election priority  Master (default)
  Temperature        33 degrees C / 91 degrees F
  CPU temperature    30 degrees C / 86 degrees F
  DRAM               2048 MB
  Memory utilization 12 percent
  CPU utilization:
    User             0 percent
    Background       0 percent
    Kernel           1 percent
    Interrupt        0 percent
    Idle             98 percent
  Model              RE-3.0
  Serial ID          210865700363
  Start time         2004-08-05 18:42:05 PDT
  Uptime             9 days, 22 hours, 48 minutes, 20 seconds
  Last reboot reason Router rebooted after a normal shutdown
  Load averages:    1 minute   5 minute   15 minute
                      0.00      0.02      0.00

```

1cc2-re0:

-----  
Routing Engine status:

```

Slot 0:
  Current state      Master
  Election priority  Master (default)
  Temperature        34 degrees C / 93 degrees F
  CPU temperature    35 degrees C / 95 degrees F
  DRAM               2048 MB
  Memory utilization 12 percent
  CPU utilization:
    User             0 percent
    Background       0 percent
    Kernel           2 percent
    Interrupt        0 percent
    Idle             98 percent
  Model              RE-4.0
  Serial ID          P11123900126
  Start time         2004-08-05 18:42:05 PDT
  Uptime             9 days, 22 hours, 49 minutes, 4 seconds
  Last reboot reason Router rebooted after a normal shutdown
  Load averages:    1 minute   5 minute   15 minute
                      0.01      0.01      0.0

```

**show chassis routing-engine lcc (TX Matrix Router)**

```

user@host> show chassis routing-engine 0 lcc 0
lcc0-re0:
-----
Routing Engine status:
Slot 0:
  Current state           Master
  Election priority       Master (default)
  Temperature             33 degrees C / 91 degrees F
  CPU temperature         30 degrees C / 86 degrees F
  DRAM                    2048 MB
  Memory utilization      12 percent
  CPU utilization:
    User                  0 percent
    Background            0 percent
    Kernel                1 percent
    Interrupt             0 percent
    Idle                  98 percent
  Model                   RE-3.0
  Serial ID               210865700363
  Start time              2004-08-05 18:42:05 PDT
  Uptime                  7 days, 22 hours, 49 minutes, 6 seconds
  Last reboot reason      Router rebooted after a normal shutdown
  Load averages:         1 minute  5 minute 15 minute
                        0.00      0.00   0.00

```

**show chassis routing-engine bios (TX Matrix Router)**

```

user@host> show chassis routing-engine bios
scc-re0:
-----
Routing Engine BIOS Version: V1.0.0
lcc0-re0:
-----
Routing Engine BIOS Version: V1.0.17
lcc2-re0:
-----
Routing Engine BIOS Version: V1.0.0

```

**show chassis routing-engine (TX Matrix Plus Router)**

```

user@host> show chassis routing-engine
sfc0-re0:
-----
Routing Engine status:
Slot 0:
  Current state           Master
  Election priority       Master (default)
  Temperature             27 degrees C / 80 degrees F
  CPU temperature         42 degrees C / 107 degrees F
  DRAM                    3327 MB
  Memory utilization      12 percent
  CPU utilization:
    User                  0 percent
    Background            0 percent
    Kernel                2 percent

```

```

        Interrupt          0 percent
        Idle               98 percent
        Model              RE-TXP-SFC
        Serial ID          737A-1024
        Start time         2009-05-11 17:39:49 PDT
        Uptime              3 hours, 45 minutes, 25 seconds
        Last reboot reason  Router rebooted after a normal shutdown.
        Load averages:     1 minute   5 minute   15 minute
                           0.00        0.00        0.00
Routing Engine status:
Slot 1:
  Current state            Backup
  Election priority        Backup (default)
  Temperature              29 degrees C / 84 degrees F
  CPU temperature          43 degrees C / 109 degrees F
  DRAM                    3327 MB
  Memory utilization       11 percent
  CPU utilization:
    User                   0 percent
    Background             0 percent
    Kernel                 0 percent
    Interrupt              0 percent
    Idle                   100 percent
  Model                    RE-TXP-SFC
  Serial ID                737A-1024
  Start time               2009-05-11 17:08:54 PDT
  Uptime                   4 hours, 16 minutes, 52 seconds
  Last reboot reason       0x1:power cycle/failure

lcc0-re0:
-----
Routing Engine status:
Slot 0:
  Current state            Master
  Election priority        Master (default)
  Temperature              30 degrees C / 86 degrees F
  CPU temperature          43 degrees C / 109 degrees F
  DRAM                    3327 MB
  Memory utilization       9 percent
  CPU utilization:
    User                   0 percent
    Background             0 percent
    Kernel                 2 percent
    Interrupt              0 percent
    Idle                   98 percent
  Model                    RE-TXP-LCC
  Serial ID                737F-1024
  Start time               2009-05-11 17:40:32 PDT
  Uptime                   3 hours, 44 minutes, 51 seconds
  Last reboot reason       Router rebooted after a normal shutdown.
  Load averages:         1 minute   5 minute   15 minute
                           0.00        0.00        0.00
Routing Engine status:
Slot 1:
  Current state            Backup
  Election priority        Backup (default)
  Temperature              30 degrees C / 86 degrees F
  CPU temperature          43 degrees C / 109 degrees F
  DRAM                    3327 MB
  Memory utilization       9 percent

```

```

CPU utilization:
  User          0 percent
  Background    0 percent
  Kernel        0 percent
  Interrupt     0 percent
  Idle          100 percent
Model          RE-TXP-LCC
Serial ID      737F-1024
Start time     2009-05-06 17:31:32 PDT
Uptime         5 days, 3 hours, 54 minutes, 19 seconds
Last reboot reason Router rebooted after a normal shutdown.

```

### show chassis routing-engine lcc (TX Matrix Plus Router)

```
user@host> show chassis routing-engine 0 lcc 0
```

```
lcc0-re0:
```

```
-----
Routing Engine status:
```

```
Slot 0:
```

```

  Current state      Master
  Election priority  Master (default)
  Temperature        30 degrees C / 86 degrees F
  CPU temperature    43 degrees C / 109 degrees F
  DRAM               3327 MB
  Memory utilization 9 percent
  CPU utilization:
    User            0 percent
    Background      0 percent
    Kernel          2 percent
    Interrupt       0 percent
    Idle            98 percent
  Model             RE-TXP-LCC
  Serial ID         737F-1024
  Start time        2009-05-11 17:40:32 PDT
  Uptime            3 hours, 45 minutes, 26 seconds
  Last reboot reason Router rebooted after a normal shutdown.
  Load averages:    1 minute  5 minute 15 minute
                    0.00      0.00   0.00

```

```
Routing Engine status:
```

```
Slot 1:
```

```

  Current state      Backup
  Election priority  Backup (default)
  Temperature        30 degrees C / 86 degrees F
  CPU temperature    43 degrees C / 109 degrees F
  DRAM               3327 MB
  Memory utilization 9 percent
  CPU utilization:
    User            0 percent
    Background      0 percent
    Kernel          0 percent
    Interrupt       0 percent
    Idle            100 percent
  Model             RE-TXP-LCC
  Serial ID         737F-1024
  Start time        2009-05-06 17:31:32 PDT
  Uptime            5 days, 3 hours, 54 minutes, 59 seconds
  Last reboot reason Router rebooted after a normal shutdown.

```

### show chassis routing-engine bios (TX Matrix Plus Router)

```
user@host> show chassis routing-engine bios
```

```
sfc0-re0:
```

```
-----  
Routing Engine BIOS Version: V0.0.Z
```

```
lcc0-re0:
```

```
-----  
Routing Engine BIOS Version: V0.0.N
```

### show chassis routing-engine (QFX Series)

```
user@switch> show chassis routing-engine
```

```
Routing Engine status:
```

```
Slot 0:
```

```
Current state Master
```

```
Election priority Master (default)
```

```
DRAM 2820 MB
```

```
Memory utilization 49 percent
```

```
CPU utilization:
```

```
User 1 percent
```

```
Background 0 percent
```

```
Kernel 1 percent
```

```
Interrupt 0 percent
```

```
Idle 97 percent
```

```
Model QFX3500-48S4Q
```

```
Serial ID S/N ED3709
```

```
Uptime 3 days, 4 hours, 29 minutes, 42 seconds
```

```
Last reboot reason 0x200:chassis control reset
```

```
Load averages: 1 minute 5 minute 15 minute
```

```
0.37 0.26 0.19
```

### show chassis routing-engine (OCX Series)

```
user@switch> show chassis routing-engine
```

```
Routing Engine status:
```

```
Slot 0:
```

```
Current state Master
```

```
Election priority Master (default)
```

```
DRAM 2820 MB
```

```
Memory utilization 49 percent
```

```
CPU utilization:
```

```
User 1 percent
```

```
Background 0 percent
```

```
Kernel 1 percent
```

```
Interrupt 0 percent
```

```
Idle 97 percent
```

```
Model OCX-1100-48SX-AFI
```

```
Serial ID S/N ED3709
```

```
Uptime 3 days, 4 hours, 29 minutes, 42 seconds
```

```
Last reboot reason 0x200:chassis control reset
```

```
Load averages: 1 minute 5 minute 15 minute
```

```
0.37 0.26 0.19
```

**show chassis routing-engine interconnect-device (QFabric Systems)**

```
user@switch> show chassis routing-engine
```

**Routing Engine status:****Slot 0:**

Current state	Master
Election priority	Master (default)
Temperature	48 degrees C / 118 degrees F
DRAM	3312 MB
Memory utilization	63 percent
CPU utilization:	
User	14 percent
Background	0 percent
Kernel	5 percent
Interrupt	0 percent
Idle	81 percent
Model	RE-QFXC08-CB4S
Serial ID	BUILTIN
Start time	2011-07-06 13:26:15 UTC
Uptime	11 hours, 24 minutes, 57 seconds
Last reboot reason	0x4:reset-button reset
Load averages:	1 minute    5 minute    15 minute
	2.62        2.31        2.28

**Routing Engine status:****Slot 1:**

Current state	Backup
Election priority	Backup (default)
Temperature	39 degrees C / 102 degrees F
DRAM	3312 MB
Memory utilization	59 percent
CPU utilization:	
User	9 percent
Background	0 percent
Kernel	1 percent
Interrupt	0 percent
Idle	91 percent
Model	RE-QFXC08-CB4S
Serial ID	BUILTIN
Start time	2011-07-06 13:24:58 UTC
Uptime	11 hours, 26 minutes, 18 seconds
Last reboot reason	0x4:reset-button reset

**show chassis routing-engine (PTX Series Packet Transport Router)**

```
user@switch> show chassis routing-engine
```

**Routing Engine status:****Slot 0:**

Current state	Master
Election priority	Master (default)
Temperature	60 degrees C / 140 degrees F
CPU temperature	76 degrees C / 168 degrees F
DRAM	17152 MB
Memory utilization	11 percent
CPU utilization:	
User	0 percent
Background	0 percent
Kernel	4 percent

```

        Interrupt          0 percent
        Idle              95 percent
        Model             RE-DUO-2600
        Serial ID         P737A-002231
        Start time        2011-12-21 16:54:37 PST
        Uptime            25 minutes, 44 seconds
        Last reboot reason Router rebooted after a normal shutdown.
        Load averages:    1 minute   5 minute   15 minute
                           0.01       0.02       0.06

Routing Engine status:
Slot 1:
  Current state          Backup
  Election priority      Backup (default)
  Temperature            50 degrees C / 122 degrees F
  CPU temperature        64 degrees C / 147 degrees F
  DRAM                   17152 MB
  Memory utilization     10 percent
  CPU utilization:
    User                 0 percent
    Background           0 percent
    Kernel               0 percent
    Interrupt            0 percent
    Idle                 99 percent
  Model                  RE-DUO-2600
  Serial ID              P737A-002438
  Start time             2011-12-21 16:52:26 PST
  Uptime                 27 minutes, 49 seconds
  Last reboot reason     Router rebooted after a normal shutdown.

```

### show chassis routing-engine (EX9200 Switch)

```
user@switch> show chassis routing-engine
```

```

Routing Engine status:
Slot 0:
  Current state          Master
  Election priority      Master (default)
  Temperature            35 degrees C / 95 degrees F
  CPU temperature        33 degrees C / 91 degrees F
  DRAM                   8157 MB
  Installed Memory       8192 MB
  Memory utilization     18 percent
  CPU utilization:
    User                 1 percent
    Background           0 percent
    Kernel               4 percent
    Interrupt            1 percent
    Idle                 94 percent
  Model                  RE-S-EX9200-1800X4
  Serial ID              9009119555
  Start time             2014-03-12 14:58:05 UTC
  Uptime                 1 hour, 41 minutes, 51 seconds
  Last reboot reason     Router rebooted after a normal shutdown.
  Load averages:        1 minute   5 minute   15 minute
                           0.02       0.02       0.00

Routing Engine status:
Slot 1:
  Current state          Backup
  Election priority      Backup (default)

```



[...Output truncated...]

### show chassis routing-engine (EX9251 Switch)

```
user@switch> show chassis routing-engine
```

```
Routing Engine status:
  Temperature           50 degrees C / 122 degrees F
  CPU temperature       50 degrees C / 122 degrees F
  DRAM                  16340 MB (16384 MB installed)
  Memory utilization    6 percent
  5 sec CPU utilization:
    User                 2 percent
    Background           0 percent
    Kernel               19 percent
    Interrupt            0 percent
    Idle                 79 percent
  1 min CPU utilization:
    User                 2 percent
    Background           0 percent
    Kernel               19 percent
    Interrupt            0 percent
    Idle                 79 percent
  5 min CPU utilization:
    User                 2 percent
    Background           0 percent
    Kernel               19 percent
    Interrupt            0 percent
    Idle                 79 percent
  15 min CPU utilization:
    User                 2 percent
    Background           0 percent
    Kernel               19 percent
    Interrupt            0 percent
    Idle                 79 percent
  Model                 RE-S-2X00x6
  Start time            2018-03-08 05:11:33 PST
  Uptime                10 days, 18 hours, 59 minutes, 15 seconds
  Last reboot reason    0x4000:VJUNOS reboot
  Load averages:       1 minute   5 minute  15 minute
                      1.06       1.09     1.08
```

### show chassis routing-engine (ACX2000 Universal Metro Router)

```
user@host> show chassis routing-engine
```

```
Routing Engine status:
  Temperature           53 degrees C / 127 degrees F
  DRAM                  1536 MB
  Memory utilization    25 percent
  CPU utilization:
    User                 0 percent
    Background           0 percent
    Kernel               0 percent
    Interrupt            1 percent
    Idle                 99 percent
  Model                 RE-ACX-2000
  Start time            2012-05-09 00:57:07 PDT
```

Uptime	5 days, 3 hours, 16 minutes, 15 seconds
Last reboot reason	Router rebooted after a normal shutdown.
Load averages:	1 minute    5 minute    15 minute
	0.00            0.03            0.05

#### show chassis routing-engine (ACX1000 Universal Metro Router)

```
user@host> show chassis routing-engine
```

```
Routing Engine status:
  Temperature           36 degrees C / 96 degrees F
  DRAM                  768 MB
  Memory utilization     50 percent
  CPU utilization:
    User                 3 percent
    Background           0 percent
    Kernel               6 percent
    Interrupt            0 percent
    Idle                 91 percent
  Model                 RE-ACX-1000
  Start time            2012-05-10 07:12:23 PDT
  Uptime                4 days, 10 hours, 46 minutes, 53 seconds
  Last reboot reason    Router rebooted after a normal shutdown.
  Load averages:       1 minute    5 minute    15 minute
                       0.00            0.00            0.00
```

#### show chassis routing-engine (Displaying the guest reboot reason on PTX5000,MX240, MX480, MX960< MX2010, and MX2020)

```
user@host> show chassis routing-engine re0 | match "Last reboot reason"
```

```
Last reboot reason 0x4000:VJUNOS reboot
```

## show chassis scb

<b>Syntax</b>	show chassis scb
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	(M40 router only) Display System Control Board (SCB) status information.
<b>Options</b>	This command has no options.
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><i>Checklist for Monitoring the SCB</i></li> </ul>
<b>List of Sample Output</b>	<a href="#">show chassis scb on page 2115</a>
<b>Output Fields</b>	<a href="#">Table 157 on page 2113</a> lists the output fields for the <b>show chassis scb</b> command. Output fields are listed in the approximate order in which they appear.

*Table 157: show chassis scb Output Fields*

Field Name	Field Description
Temperature	Temperature of the air passing by the SCB, in degrees Celsius.
CPU utilization	Total percentage of CPU being used by the SCB's processor.
Interrupt utilization	Of the total CPU being used by the SCB's processor, the percentage being used for interrupts.
Heap utilization	Percentage of heap space being used by the SCB's processor.
Buffer utilization	Percentage of buffer space being used by the SCB's processor.
DRAM	Total DRAM available to the SCB's processor.
Start time	Time when the SCB started running.
Uptime	How long the SCB has been running.

*Table 157: show chassis scb Output Fields (continued)*

Field Name	Field Description
<b>Internet Processor memory</b>	<p>Information about the memory of the Internet Processor ASIC on the SCB:</p> <ul style="list-style-type: none"><li>• <b>IP routes</b>—Number of IP routes known to the Internet Processor.</li><li>• <b>MPLS routes</b>—Number of MPLS routes known to the Internet Processor.</li><li>• <b>SRAM banks enabled</b>—Which SRAM banks are enabled.</li><li>• <b>SRAM size</b>—Size of SCB SRAM, in bytes.</li><li>• <b>SRAM used</b>—Amount of SRAM used, in bytes.</li><li>• <b>SRAM utilization</b>—Percentage of SRAM used.</li></ul>

---

## Sample Output

show chassis scb

```
user@host> show chassis scb
```

```
SCB status:
  Temperature:          30 Centigrade
  CPU utilization:      5 percent
  Interrupt utilization: 0 percent
  Heap utilization:     0 percent
  Buffer utilization:    2 percent
  DRAM:                 64 Mbytes
  Start time:           1998-10-28 18:35:46 UTC
  Uptime:               6 minutes, 16 seconds
  Internet Processor memory:
    IP routes:          16
    MPLS routes:        1
    SRAM banks enabled: [ 1 1 1 1 ]
    SRAM size:          4 Mbytes
    SRAM used:          256 bytes
    SRAM utilization:   0 percent
```

## show chassis sfb

---

List of Syntax	<a href="#">Syntax on page 2116</a> <a href="#">Syntax (MX10008 Universal Edge Routers) on page 2116</a>
Syntax	<pre>show chassis sfb &lt;all-members&gt; &lt;local&gt; &lt;member member-id&gt; &lt; slot sfb-slot-number&gt;</pre>
Syntax (MX10008 Universal Edge Routers)	<pre>show chassis sfb errors &lt; slot sfb-slot-number&gt;</pre>
Release Information	<p>Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms. Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms. <b>all-members</b>, <b>local</b>, and <b>member member-id</b> options introduced in Junos OS Release 15.1 for MX2020 and MX2010 routers.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms. Command introduced in Junos OS Release 18.2 for MX10008 Universal Routing Platforms.</p>
Description	Display chassis information about the Switch Fabric Board (SFB).
Options	<p><b>none</b>—Display chassis information about all Switch Fabric Boards.</p> <p><b>all-members</b>—(Optional) Display chassis information about the SFB in all members of the Virtual Chassis configuration.</p> <p><b>local</b>—(Optional) Display chassis information about the SFB in the local member of the Virtual Chassis.</p> <p><b>member member-id</b>—(Optional) Display chassis information about the SFB in the specified member of the Virtual Chassis. Replace <b>member-id</b> with the value 0 or 1.</p> <p><b>sfb-slot-number</b>—(Optional) Display chassis information about the specified Switch Fabric Board. For MX2020, MX2010, and MX2008 routers, replace <b>sfb-slot-number</b> with a value from 0 through 7.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"><li>• <a href="#">request chassis sfb on page 893</a></li></ul>
List of Sample Output	<a href="#">show chassis sfb (MX2020 Router) on page 2117</a> <a href="#">show chassis sfb (MX2010 Router) on page 2117</a>

[show chassis sfb \(MX2008 Router\) on page 2117](#)  
[show chassis sfb \(MX10008 Router\) on page 2118](#)

**Output Fields** Table 158 on page 2117 lists the output fields for the **show chassis sfb** command. Output fields are listed in the approximate order in which they appear.

Table 158: show chassis sfb Output Fields

Field Name	Field Description
Slot	Slot number.
State	Status of the SFB. <ul style="list-style-type: none"> <li>• <b>Online</b>—The SFB is online and running.</li> <li>• <b>Offline</b>—SFB is powered down.</li> </ul>
Uptime	How long the Routing Engine has been connected to the SFB and, therefore, how long the SFB has been up and running.

## Sample Output

### show chassis sfb (MX2020 Router)

```
user@host> show chassis sfb
```

Slot	State	Uptime
0	Online	6 hours, 11 minutes, 33 seconds
1	Online	6 hours, 11 minutes, 27 seconds
2	Online	6 hours, 11 minutes, 21 seconds
3	Online	6 hours, 11 minutes, 15 seconds
4	Online	6 hours, 11 minutes, 8 seconds
5	Online	6 hours, 11 minutes, 2 seconds
6	Online	6 hours, 10 minutes, 57 seconds
7	Online	6 hours, 10 minutes, 51 seconds

### show chassis sfb (MX2010 Router)

```
user@host> show chassis sfb
```

Slot	State	Uptime
0	Online	6 hours, 48 minutes, 28 seconds
1	Online	6 hours, 48 minutes, 23 seconds
2	Online	6 hours, 48 minutes, 17 seconds
3	Offline	--- Restarting unresponsive board ---
4	Online	6 hours, 48 minutes, 12 seconds
5	Online	6 hours, 48 minutes, 6 seconds
6	Online	6 hours, 48 minutes
7	Online	6 hours, 47 minutes, 55 seconds

### show chassis sfb (MX2008 Router)

```
user@host> show chassis sfb
```

Slot	State	Uptime
0	Online	10 days, 6 hours, 52 minutes, 38 seconds

1	Online	10 days, 6 hours, 52 minutes, 32 seconds
2	Online	10 days, 6 hours, 52 minutes, 26 seconds
3	Online	10 days, 6 hours, 52 minutes, 20 seconds
4	Online	10 days, 6 hours, 52 minutes, 15 seconds
5	Online	10 days, 6 hours, 52 minutes, 9 seconds
6	Online	10 days, 6 hours, 52 minutes, 3 seconds
7	Online	10 days, 6 hours, 51 minutes, 58 seconds

#### show chassis sfb (MX10008 Router)

```
user@host> show chassis sfb
```

Slot	State	Uptime
0	Online	21 hours, 25 minutes, 50 seconds
1	Online	21 hours, 25 minutes, 22 seconds
2	Online	21 hours, 24 minutes, 55 seconds
3	Online	21 hours, 24 minutes, 27 seconds
4	Online	21 hours, 23 minutes, 56 seconds
5	Online	21 hours, 23 minutes, 23 seconds



## show chassis sfb errors

<b>Syntax</b>	<code>show chassis sfb errors</code> <code>&lt; slot <i>sfb-slot-number</i>&gt;</code>
<b>Release Information</b>	Command introduced in Junos OS Release 18.2 for MX10008 Universal Routing Platform.
<b>Description</b>	Display information about errors pertaining to Switch Fabric Boards (SFBs).
<b>Options</b>	<p><b>none</b>—Display information about the errors pertaining to all the SFBs in the router.</p> <p><b><i>sfb-slot-number</i></b>—(Optional) Display information about error for the specified Switch Fabric Board.</p> <p><b>Range:</b> 0–5</p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><a href="#">request chassis sfb on page 893</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">show chassis sfb errors slot 1(MX10008 Router) on page 2120</a>
<b>Output Fields</b>	Table 158 on page 2117 lists the output fields for the <b>show chassis sfb errors</b> command. Output fields are listed in the approximate order in which they appear.

Table 159: show chassis sfb errors Output Fields

Field Name	Field Description
Slot	Displays the SFB slot number.
Name	Displays the name of the SFB. In MX10008 routers, SFB is identified as SIB.
DeviceID	Displays device ID.
Threshold	Displays the error threshold.
Active	Displays the number of active error instances.
Occurred	Displays the number of error instances occurred.
Cleared	Displays the number of error instances cleared.
Description	Displays error description.

## Sample Output

### show chassis sfb errors slot 1(MX10008 Router)

```
user@host> show chassis sfb errors slot 1
```

Slot Name	DeviceId	Threshold	Active	Occured	Cleared	Description
1 SIB 1_LTC3880_0	09204F8B00	1	0	0	0	PF0 Core
0.9V, voltage	09204FFFFF	1	0	0	0	PF0 Core
0.9V, I2C Access						
SIB 1_LTC3880_1	09204D8B00	1	0	0	0	PF0 AVDD
1V, voltage	09204DFFFF	1	0	0	0	PF0 AVDD
1V, I2C Access						
SIB 1_LTC3880_2	09204B8B00	1	0	0	0	PF1 Core
0.9V, voltage	09204BFFFF	1	0	0	0	PF1 Core
0.9V, I2C Access						
SIB 1_LTC3880_3	0920498B00	1	0	0	0	PF1 AVDD
1V, voltage	092049FFFF	1	0	0	0	PF1 AVDD
1V, I2C Access						
SIB 1_VT7505_0	0910408800	1	0	0	0	HOTSWAP
12V, voltage	091040FFFF	1	0	0	0	HOTSWAP
12V, I2C Access						
SIB 1_TEMP_0	0901000000	1	0	0	0	Intake-A
Temp Sensor	0901000100	1	0	0	0	Intake-B
Temp Sensor	0901002300	1	0	0	0	PF0 Temp
Sensor						
SIB 1_TEMP_1	0902000000	1	0	0	0	Exhaust-A
Temp Sensor	0902000100	1	0	0	0	Exhaust-B
Temp Sensor	0902002300	1	0	0	0	PF1 Temp
Sensor						

## show chassis sfm

<b>Syntax</b>	<code>show chassis sfm</code> <code>&lt;detail &lt;sfm-slot&gt;&gt;</code>
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	(M40e and M160 routers only) Display Switching and Forwarding Module (SFM) status information.
<b>Options</b>	<p><b>none</b>—Display standard status information about all SFMs.</p> <p><b>detail</b>—(Optional) Display detailed SFM status information.</p> <p><b>sfm-slot</b>—(Optional) Display status information about the SFM in the specified slot only. For the M40e router, replace <b>sfm-slot</b> with 0 or 1. For the M160 router, replace <b>sfm-slot</b> with a value from 0 through 3.</p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">request chassis sfm on page 897</a></li> <li>• <a href="#">request chassis sfm master switch on page 895</a></li> <li>• <i>Switching the Global Master and Backup Roles in a Virtual Chassis Configuration</i></li> </ul>
<b>List of Sample Output</b>	<a href="#">show chassis sfm (M160 Router) on page 2122</a> <a href="#">show chassis sfm detail (M40e Router) on page 2123</a> <a href="#">show chassis sfm detail (M160 Router) on page 2123</a>
<b>Output Fields</b>	<a href="#">Table 160 on page 2121</a> lists the output fields for the <b>show chassis sfm</b> command. Output fields are listed in the approximate order in which they appear.

*Table 160: show chassis sfm Output Fields*

Field Name	Field Description	Level of Output
<b>Slot</b>	Slot number.	All levels
<b>State</b>	Status of the SFM. State can be any of the following: <ul style="list-style-type: none"> <li>• <b>Online</b>—SFM is online and running.</li> <li>• <b>Online-Standby</b> (M40e router only)—SFM is online, operating as Standby.</li> <li>• <b>Offline</b>—SFM is powered down.</li> <li>• <b>Empty</b>—No SFM is present.</li> </ul>	All levels
<b>Reason</b>	If the status is <b>Offline</b> , reason for this state.	All levels

Table 160: show chassis sfm Output Fields (continued)

Field Name	Field Description	Level of Output
<b>Temp</b>	Temperature of air passing by the SFM, in degrees Celsius.	none specified
<b>CPU Utilization (%)</b>	Information about CPU usage.	none specified
<b>Total</b>	Total percentage of the CPU being used by the SFM's processor.	All levels
<b>Interrupt</b>	Of the total CPU being used by the SFM's processor, the percentage being used for interrupts.	All levels
<b>Memory Utilization</b>	Information about memory usage.	none specified
<b>DRAM</b>	Total DRAM available to the SFM's processor, in megabytes (MB).	All levels
<b>Heap</b>	Percentage of heap space (dynamic memory) being used by the SFM's processor. If this number exceeds 80 percent, it might indicate a software problem (memory leak).	All levels
<b>Buffer</b>	Percentage of buffer space being used by the SFM's processor for buffering internal messages.	All levels
<b>SPP Temperature</b>	Temperature of air passing by the Switch Plane Processor card, in degrees Celsius and Fahrenheit	detail
<b>SPR Temperature</b>	Temperature of air passing by the Switch Plane Router card, in degrees Celsius and Fahrenheit.	detail
<b>Total CPU DRAM</b>	Total amount of CPU DRAM being used by the SFM's processor.	detail
<b>Total SSRAM</b>	Total amount of SSRAM being used by the SFM's processor.	detail
<b>Internet processor II</b>	(M160 router only) Processor type.	detail
<b>Start time</b>	Time this SFM became active.	detail
<b>Uptime</b>	How long the SFM has been up and running.	detail
<b>Packet scheduling mode</b>	(M160 router only) Enabled or disabled.	detail

## Sample Output

### show chassis sfm (M160 Router)

```
user@host> show chassis sfm
```

```
SFM status:
```

Slot	State	Temp (C)	CPU Utilization (%) Total	Interrupt	Memory Utilization (%) DRAM (MB)	Heap	Buffer
------	-------	----------	---------------------------	-----------	----------------------------------	------	--------

0	Online	39	0	0	64	0	6
1	Online	43	0	0	64	0	6
2	Empty	0	0	0	0	0	0
3	Empty	0	0	0	0	0	0

### show chassis sfm detail (M40e Router)

```
user@host> show chassis sfm detail
```

```
Slot 0 information:
  State                Offline
  Reason:              - power configured off
Slot 1 information:
  State                Present
  SPP temperature      0 degrees C / 32 degrees F
  SPR temperature      0 degrees C / 32 degrees F
  Total CPU DRAM       0 MB
  Total SSRAM          0 MB
```

### show chassis sfm detail (M160 Router)

```
user@host> show chassis sfm detail
```

```
Slot 0 information:
  State                Online
  SPP temperature      37 degrees C / 98 degrees F
  SPR temperature      39 degrees C / 102 degrees F
  Total CPU DRAM       64 MB
  Total SSRAM          8 MB
  Internet Processor II Version 1, Foundry IBM, Part number 9
  Start time:          2004-08-17 09:23:08 PDT
  Uptime:              72 days, 1 hour, 15 minutes, 57 seconds
Slot 1 information:
  State                Online
  SPP temperature      36 degrees C / 96 degrees F
  SPR temperature      37 degrees C / 98 degrees F
  Total CPU DRAM       64 MB
  Total SSRAM          8 MB
  Internet Processor II Version 1, Foundry IBM, Part number 9
  Start time:          2004-08-17 09:23:08 PDT
  Uptime:              72 days, 1 hour, 15 minutes, 57 seconds
Slot 2 information:
....
Packet scheduling mode : Disabled
```

## show chassis sibs

<b>List of Syntax</b>	<a href="#">Syntax on page 2124</a> <a href="#">Syntax (TX Matrix Router) on page 2124</a> <a href="#">Syntax (TX Matrix Plus Router) on page 2124</a> <a href="#">Syntax (PTX Series Packet Transport Routers) on page 2124</a>
<b>Syntax</b>	show chassis sibs
<b>Syntax (TX Matrix Router)</b>	show chassis sibs <lcc number   scc>
<b>Syntax (TX Matrix Plus Router)</b>	show chassis sibs <lcc number   sfc number>
<b>Syntax (PTX Series Packet Transport Routers)</b>	show chassis sibs <detail> <slot>
<b>Release Information</b>	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 12.1 for the PTX Series Packet Transport Routers.</p> <p><b>sfc</b> option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p><b>detail</b> and <b>sib-slot</b> options introduced for the PTX Packet Transport Router in Junos OS Release 12.1</p> <p>Command introduced in Junos OS Release 17.2 for PTX10008 Routers.</p>
<b>Description</b>	(M320,T Series routers, TX Matrix routers, TX Matrix Plus routers, and PTX Series routers only) Display Switch Interface Boards (SIBs) status information.
<b>Options</b>	<p><b>none</b>—(TX Matrix routers and TX Matrix Plus routers only) On a TX Matrix router, display the SIB status for the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display the SIB status for the TX Matrix Plus router and its attached routers.</p> <p><b>detail</b>—(PTX Series) (Optional) Display detailed SIB status information.</p> <p><b>lcc number</b>—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display SIB status information for a specified T640 router (line-card chassis or LCC) that is connected to the TX Matrix router. On a TX Matrix Plus router, display SIB status information for a specified T1600 or T4000 router (LCC) that is connected to the TX Matrix Plus router.</p>

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**scc**—(TX Matrix routers only) (Optional) Display SIB status information for the TX Matrix router (switch-card chassis).

**sfc number**—(TX Matrix Plus routers only) (Optional) Display SIB status information for the TX Matrix Plus router (switch-fabric chassis or SFC). Replace *number* with 0.

**slot**—(PTX Series) (Optional) Display status information about the SIB in the specified slot only. The range of values is 0 through 8.

**Required Privilege Level** view

**Related Documentation**

- [request chassis sib on page 898](#)
- [show chassis spmb sibs on page 2147](#)
- [show chassis environment sib on page 1271](#)
- *Monitoring the SIBs*
- *M320 SIB Description*
- *Routing Matrix with a TX Matrix Plus Router Solutions Page*

**List of Sample Output**

- [show chassis sibs \(T640 Router\) on page 2128](#)
- [show chassis sibs \(T4000 Router\) on page 2128](#)
- [show chassis sibs \(TX Matrix Router\) on page 2129](#)
- [show chassis sibs \(T1600 Router\) on page 2129](#)
- [show chassis sibs \(TX Matrix Plus Router\) on page 2129](#)
- [show chassis sibs \(TX Matrix Plus Router with 3D SIBs\) on page 2131](#)
- [show chassis sibs sfc \(TX Matrix Plus Router\) on page 2133](#)
- [show chassis sibs lcc \(TX Matrix Plus Router\) on page 2134](#)
- [show chassis sibs lcc \(TX Matrix Plus Router with 3D SIBs\) on page 2134](#)
- [show chassis sibs \(M320 Router\) on page 2134](#)
- [show chassis sibs \(PTX Series\) on page 2134](#)
- [show chassis sibs \(PTX Series\) on page 2135](#)

**Output Fields** Table 161 on page 2126 lists the output fields for the **show chassis sibs** command. Output fields are listed in the approximate order in which they appear.

*Table 161: show chassis sibs Output Fields*

Field Name	Field Description
Slot	SIB slot number.
Type	(TX Matrix Plus router only) SIB type.
Uptime	How long the SIB has been up and running.
State	<p>SIB status:</p> <ul style="list-style-type: none"> <li>• <b>Activating</b>—SIB is coming online; this is a transitional state.</li> <li>• <b>Deactivating</b>—SIB is going offline; this is a transitional state.</li> <li>• <b>Connected</b>—SIBs on a T1600 router are connected and trained but are either not online or are spare, because the plane on the TX Matrix Plus router (or switch-fabric chassis) is still offline.</li> <li>• <b>Disconnected</b>—SIBs on all T640 routers on the TX Matrix router (switch-card chassis) are in the <b>Disconnected</b> state, because a SIB on the SCC has gone offline. Likewise, SIBs on all T1600 routers on the TX Matrix Plus router (or switch-fabric chassis) are in the <b>Disconnected</b> state, because a SIB on the SFC has gone offline.</li> </ul> <p>On the TX Matrix Plus router with 3D SIBs, the LCC SIB is also disconnected if the F13 SIB is online, but none of the cables are connected or trained.</p> <ul style="list-style-type: none"> <li>• <b>Online</b>—SIB is operational and running.</li> <li>• <b>Offline</b>—SIB is powered down.</li> </ul> <p><b>NOTE:</b> If a SIB transitions to the <b>Offline</b> state, the command displays an appropriate reason in the output. For instance, if the SIB is taken offline using the <b>request chassis sib</b> command, the <b>show chassis sibs</b> command displays <b>--- Offlined by cli command ---</b> in the output.</p> <ul style="list-style-type: none"> <li>• <b>Spare</b>—SIB is redundant and will move to active state if one of the working SIBs fails to pass traffic.</li> </ul> <p><b>NOTE:</b> <b>Spare</b> does not apply to PTX Series Packet Transport Routers, as there are no spare SIBs.</p> <ul style="list-style-type: none"> <li>• <b>Empty</b>—No SIB is present.</li> <li>• <b>Fault</b>—SIB is in an alarmed state in which none of the SIB's planes are operational for one of the following reasons: <ul style="list-style-type: none"> <li>• All onboard fabric ASICs are not operational.</li> <li>• Fiber-optic connector faults.</li> <li>• FPC connector faults.</li> <li>• SIB midplane connector faults.</li> </ul> </li> <li>• <b>Check</b>—SIB is in an alarmed state due to link errors or destination errors. A SIB can transition to the <b>Check</b> state from the online or spare state.</li> </ul>



Table 161: show chassis sibs Output Fields (continued)

Field Name	Field Description
	<p>The <b>Check</b> state can be caused by the following reasons:</p> <ul style="list-style-type: none"> <li>• Unsupported FPC installed on a router.</li> <li>• SIB not inserted properly (such as bent pins).</li> <li>• Destination errors are detected on the SIB. In this case, the Packet Forwarding Engine stops using the SIB to send traffic to the affected destination Packet Forwarding Engine. When a Packet Forwarding Engine cannot be reached on that plane or SIB, a destination error is reported against that SIB.</li> </ul> <p><b>NOTE:</b> For SIBs in the <b>Check</b> state, the output displays some additional information:</p> <ul style="list-style-type: none"> <li>• In Junos OS Release 9.6 and later, the <b>Check</b> state message shows the number of Packet Forwarding Engines in the plane having destination errors. For example, <b>Check (10 destination errors)</b> indicates 10 Packet Forwarding Engines cannot be reached on that particular SIB. If there are no destination errors, and if the SIB transitions to the <b>Check</b> state because of link errors only, the <b>Check</b> state message shows <b>Check (0 destination errors)</b>.</li> <li>• In Junos OS Release 9.5 and earlier, the <b>Check</b> state message shows <b>Check (destination errors)</b> if there are Packet Forwarding Engines with destination errors in this plane. However, it does not show the number of Packet Forwarding Engines having destination errors. If there are no destination errors and if the SIB transitions to the <b>Check</b> state because of link errors only, the <b>Check</b> state message shows <b>Check (no destination errors)</b>.</li> </ul> <p>If the SIB is in a <b>Check</b> state, because of destination errors, the CLI displays an additional line in the output, use "<b>show chassis fabric fpcs</b>" and "<b>show chassis fabric sibs</b>" for more details.</p> <ul style="list-style-type: none"> <li>• Link errors are detected on the channel between the SIB and a Packet Forwarding Engine. Link errors can be detected at initialization time or runtime: <ul style="list-style-type: none"> <li>• Link errors caused by a link training failure at initialization time—The Packet Forwarding Engine does not use the SIB to send traffic. The <b>show chassis fabric fpcs</b> command shows <b>Plane disabled</b> as status for this link.</li> <li>• Link errors caused by CRC errors detected at runtime—The Packet Forwarding Engine continues to use the SIB to send traffic. The <b>show chassis fabric fpcs</b> command shows <b>Link error</b> as the status for this link.</li> </ul> </li> </ul> <p><b>NOTE:</b> The <b>Check</b> state does not apply to PTX Series Packet Transport Routers.</p> <ul style="list-style-type: none"> <li>• <b>SFC Error</b>—If an F13 SIB on the TX Matrix Plus router (SFC) transitions to the <b>Fault</b> state (for instance, because of link errors), and then if an LCC SIB (connected to the F13 SIB) comes online, the LCC SIB transitions to the <b>SFC Error</b> state. This state indicates that the F13 SIB to which the LCC SIB is connected has errors.</li> </ul> <p><b>NOTE:</b> The <b>Connected</b>, <b>Disconnected</b>, and <b>SFC Error</b> states are only applicable to the SIBs on an LCC.</p>

Table 161: show chassis sibs Output Fields (continued)

Field Name	Field Description
	<ul style="list-style-type: none"> <li><b>Invalid</b>—The specific SIB slot is not valid for 4-LCC chassis configuration. See the <i>TX Matrix Plus Hardware Guide</i> for more information about the supported SIB slots.</li> </ul> <p><b>NOTE:</b> The <b>Invalid</b> state is applicable to TX Matrix Plus routers only.</p>
<b>Fabric links</b>	<p>Indicates status of fabric links on the SIB.</p> <ul style="list-style-type: none"> <li><b>Active</b>—All fabric links on SIB are active. Errors detected on the SIB's fabric links, if any, are reported in the Errors column.</li> <li><b>Unused</b>—All fabric links on the SIB are not used for fabric traffic.</li> </ul>
<b>Errors</b>	<p>Indicates if there is any error on the SIB.</p> <ul style="list-style-type: none"> <li><b>None</b>—No errors</li> <li><b>Link Errors</b>—Fabric link errors were found on SIB RX link.</li> <li><b>Cell drops</b>—Fabric cell drops were found on the SIB ASIC.</li> <li><b>Link Errors, Cell drops</b>—Both link errors and cell drops were detected on at least one of the SIB's fabric links.</li> <li><b>Asic Errors</b>—A fault affecting one of the ASICs on the SIB is detected. It can be an IO error or an internal error signaled by the ASIC.</li> </ul>
<b>Link Errors</b>	<p>indicate the number of links which are marked faulty because the errors on them have crossed threshold.</p>
<b>Cable Errors</b>	<p>Indicate the number of mandatory cables that are not connected, or in up state for that plane</p>
<b>Destination Errors</b>	<p>Indicate the number of destinations that are not reachable on this plane.</p>

## Sample Output

### show chassis sibs (T640 Router)

```
user@host> show chassis sibs
```

```
Slot  State                      Uptime
0      Empty
1      Offline                      --- Offlined by cli command ---
2      Check (21 destination errors) 1 day, 1 hour, 32 minutes, 55 seconds
3      Check (0 destination errors)  1 day, 1 hour, 32 minutes, 45 seconds
4      Empty
```

use "show chassis fabric fpcs" and "show chassis fabric sibs" for more details

### show chassis sibs (T4000 Router)

```
user@host> show chassis sibs
```

Slot	State	Uptime
0	Spare	
1	Online	3 hours, 48 minutes, 38 seconds
2	Online	3 hours, 48 minutes, 22 seconds
3	Online	3 hours, 48 minutes, 5 seconds
4	Online	3 hours, 47 minutes, 49 seconds

### show chassis sibs (TX Matrix Router)

```
user@host> show chassis sibs
```

```
scc-re0:
```

Slot	State	Uptime
0	Empty	
1	Empty	
2	Offline	--- Offlined by cli command ---
3	Offline	
4	Online	7 days, 21 hours, 50 minutes, 4 seconds

```
lcc0-re0:
```

Slot	State	Uptime
0	Offline	--- Offlined by cli command ---
1	Empty	
2	Check (21 destination errors)	1 day, 1 hour, 32 minutes, 55 seconds
3	Check (0 destination errors)	1 day, 1 hour, 32 minutes, 45 seconds
4	Empty	

use "show chassis fabric fpcs" and "show chassis fabric sibs" for more details

### show chassis sibs (T1600 Router)

```
user@host> show chassis sibs
```

Slot	State	Uptime
0	Check (destination errors)	2 hours, 23 minutes, 2 seconds
1	Offline	--- Offlined by cli command ---
2	Check (destination errors)	2 hours, 23 minutes, 3 seconds
3	Check (destination errors)	2 hours, 23 minutes, 3 seconds
4	Check (destination errors)	2 hours, 23 minutes, 3 seconds

use "show chassis fabric fpcs" and "show chassis fabric sibs" for more details

### show chassis sibs (TX Matrix Plus Router)

```
user@host> show chassis sibs
```

```
sfc0-re0:
```

Slot	State	Type	Link errors	Destination errors	Uptime
0	Spare	SIB F13	NONE	NONE	
1	Empty		NONE	NONE	
2	Invalid		NONE	NONE	
3	Online	SIB F13	NONE	NONE	1 hour, 53 minutes, 19 seconds
4	Empty		NONE	NONE	
5	Invalid		NONE	NONE	

6	Online	SIB F13	NONE	NONE	1 hour,
53 minutes, 8 seconds					
7	Empty		NONE	NONE	
8	Online	SIB F13	NONE	NONE	1 hour,
52 minutes, 57 seconds					
9	Empty		NONE	NONE	
10	Invalid		NONE	NONE	
11	Online	SIB F13	NONE	NONE	1 hour,
52 minutes, 46 seconds					
12	Empty		NONE	NONE	
13	Invalid		NONE	NONE	
14	Invalid		NONE	NONE	
15	Invalid		NONE	NONE	
0/0	Spare	SIB F2S	NONE	NONE	
0/2	Spare	SIB F2S	NONE	NONE	
0/4	Spare	SIB F2S	NONE	NONE	
0/6	Spare	SIB F2S	NONE	NONE	
1/0	Online	SIB F2S	NONE	NONE	1 hour,
53 minutes, 29 seconds					
1/2	Online	SIB F2S	NONE	NONE	1 hour,
53 minutes, 28 seconds					
1/4	Online	SIB F2S	NONE	NONE	1 hour,
53 minutes, 27 seconds					
1/6	Online	SIB F2S	NONE	NONE	1 hour,
53 minutes, 26 seconds					
2/0	Online	SIB F2S	NONE	NONE	1 hour,
53 minutes, 18 seconds					
2/2	Online	SIB F2S	NONE	NONE	1 hour,
53 minutes, 17 seconds					
2/4	Online	SIB F2S	NONE	NONE	1 hour,
53 minutes, 16 seconds					
2/6	Online	SIB F2S	NONE	NONE	1 hour,
53 minutes, 14 seconds					
3/0	Online	SIB F2S	NONE	NONE	1 hour,
53 minutes, 7 seconds					
3/2	Online	SIB F2S	NONE	NONE	1 hour,
53 minutes, 5 seconds					
3/4	Online	SIB F2S	NONE	NONE	1 hour,
53 minutes, 4 seconds					
3/6	Online	SIB F2S	NONE	NONE	1 hour,
53 minutes, 3 seconds					
4/0	Online	SIB F2S	NONE	NONE	1 hour,
52 minutes, 56 seconds					
4/2	Online	SIB F2S	NONE	NONE	1 hour,
52 minutes, 54 seconds					
4/4	Online	SIB F2S	NONE	NONE	1 hour,
52 minutes, 53 seconds					
4/6	Online	SIB F2S	NONE	NONE	1 hour,
52 minutes, 52 seconds					

lcc0-re0:

Slot	State	Link errors	Destination errors	Uptime
0	Spare	NONE	NONE	
1	Online	NONE	NONE	1 hour, 53 minutes, 31 seconds
2	Online	NONE	NONE	1 hour, 53 minutes, 27 seconds
3	Online	NONE	NONE	1 hour, 53 minutes, 23 seconds

4	Online	NONE	NONE	1 hour, 53 minutes, 19 seconds
---	--------	------	------	--------------------------------

### show chassis sibs (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis sibs
```

```
sfc0-re0:
```

Slot	State	Type	Cable errors	Link errors	Destination
errors	Uptime				
0	Online	SIB F13	6	NONE	NONE
	21 hours, 54 minutes, 28 seconds				
1	Online	SIB F13	8	NONE	NONE
	21 hours, 54 minutes, 12 seconds				
2	Invalid		NONE	NONE	NONE
3	Online	SIB F13	6	NONE	NONE
	21 hours, 57 minutes, 6 seconds				
4	Online	SIB F13	8	1	NONE
	21 hours, 56 minutes, 49 seconds				
5	Invalid		NONE	NONE	NONE
6	Online	SIB F13	6	NONE	NONE
	21 hours, 56 minutes, 25 seconds				
7	Online	SIB F13	8	NONE	NONE
	21 hours, 56 minutes, 8 seconds				
8	Online	SIB F13	6	NONE	NONE
	21 hours, 55 minutes, 43 seconds				
9	Online	SIB F13	8	NONE	NONE
	21 hours, 55 minutes, 26 seconds				
10	Invalid		NONE	NONE	NONE
11	Empty		NONE	NONE	NONE
12	Empty		NONE	NONE	NONE
13	Invalid		NONE	NONE	NONE
14	Invalid		NONE	NONE	NONE
15	Invalid		NONE	NONE	NONE
0/0	Online	SIB F2S	-n/a-	NONE	NONE
	21 hours, 55 minutes, 16 seconds				
0/2	Online	SIB F2S	-n/a-	NONE	NONE
	21 hours, 54 minutes, 49 seconds				
0/4	Online	SIB F2S	-n/a-	NONE	NONE
	21 hours, 54 minutes, 47 seconds				
0/6	Online	SIB F2S	-n/a-	NONE	NONE
	21 hours, 54 minutes, 45 seconds				
1/0	Online	SIB F2S	-n/a-	NONE	NONE
	21 hours, 57 minutes, 29 seconds				
1/2	Online	SIB F2S	-n/a-	NONE	NONE
	21 hours, 57 minutes, 27 seconds				
1/4	Online	SIB F2S	-n/a-	NONE	NONE
	21 hours, 57 minutes, 25 seconds				
1/6	Online	SIB F2S	-n/a-	NONE	NONE
	21 hours, 57 minutes, 23 seconds				
2/0	Online	SIB F2S	-n/a-	NONE	NONE
	21 hours, 56 minutes, 48 seconds				
2/2	Online	SIB F2S	-n/a-	NONE	NONE
	21 hours, 56 minutes, 46 seconds				
2/4	Online	SIB F2S	-n/a-	NONE	NONE
	21 hours, 56 minutes, 43 seconds				
2/6	Online	SIB F2S	-n/a-	NONE	NONE
	21 hours, 56 minutes, 41 seconds				
3/0	Online	SIB F2S	-n/a-	NONE	NONE

3/2	21 hours, 56 minutes, 6 seconds Online	SIB F2S	-n/a-	NONE	NONE
3/4	21 hours, 56 minutes, 4 seconds Online	SIB F2S	-n/a-	NONE	NONE
3/6	21 hours, 56 minutes, 2 seconds Online	SIB F2S	-n/a-	NONE	NONE
4/0	21 hours, 56 minutes Online	SIB F2S	-n/a-	NONE	NONE
4/2	21 hours, 55 minutes, 24 seconds Online	SIB F2S	-n/a-	NONE	NONE
4/4	21 hours, 55 minutes, 22 seconds Online	SIB F2S	-n/a-	NONE	NONE
4/6	21 hours, 55 minutes, 20 seconds Online	SIB F2S	-n/a-	NONE	NONE
	21 hours, 55 minutes, 18 seconds				
lcc0-re0:					
Slot	State	Cable errors	Link errors	Destination errors	Uptime
0	Online	6	NONE	NONE	21 hours,
	47 minutes, 29 seconds				
1	Online	6	NONE	NONE	21 hours,
	47 minutes, 50 seconds				
2	Online	6	NONE	NONE	21 hours,
	47 minutes, 43 seconds				
3	Online	6	NONE	NONE	21 hours,
	47 minutes, 36 seconds				
4	Empty	NONE	NONE	NONE	
use "show chassis fabric fpcs" and "show chassis fabric sibs" for more details					
lcc4-re0:					
Slot	State	Cable errors	Link errors	Destination errors	Uptime
0	Online	6	NONE	NONE	21 hours,
	57 minutes, 1 second				
1	Online	6	NONE	NONE	21 hours,
	57 minutes, 21 seconds				
2	Online	6	NONE	NONE	21 hours,
	57 minutes, 14 seconds				
3	Online	6	NONE	NONE	21 hours,
	57 minutes, 7 seconds				
4	Empty	NONE	NONE	NONE	
use "show chassis fabric fpcs" and "show chassis fabric sibs" for more details					
lcc7-re0:					
Slot	State	Cable errors	Link errors	Destination errors	Uptime
0	Online	2	NONE	NONE	21 hours,
	56 minutes, 54 seconds				
1	Online	2	NONE	NONE	21 hours,
	57 minutes, 21 seconds				
2	Online	2	NONE	NONE	21 hours,
	57 minutes, 12 seconds				
3	Online	2	NONE	NONE	21 hours,
	57 minutes, 3 seconds				
4	Empty	NONE	NONE	NONE	
use "show chassis fabric fpcs" and "show chassis fabric sibs" for more details					

## show chassis sibs sfc (TX Matrix Plus Router))

```
user@host> show chassis sibs sfc 0
```

```
sfc0-re0:
```

Slot	State	Type	Link errors	Destination errors	Uptime
0	Spare	SIB F13	NONE	NONE	
1	Empty		NONE	NONE	
2	Invalid		NONE	NONE	
3	Online	SIB F13	NONE	NONE	12 hours,
	6 minutes, 22 seconds				
4	Empty		NONE	NONE	
5	Invalid		NONE	NONE	
6	Online	SIB F13	NONE	NONE	12 hours,
	6 minutes, 11 seconds				
7	Empty		NONE	NONE	
8	Online	SIB F13	NONE	NONE	12 hours,
	6 minutes				
9	Empty		NONE	NONE	
10	Invalid		NONE	NONE	
11	Online	SIB F13	NONE	NONE	12 hours,
	5 minutes, 49 seconds				
12	Empty		NONE	NONE	
13	Invalid		NONE	NONE	
14	Invalid		NONE	NONE	
15	Invalid		NONE	NONE	
0/0	Spare	SIB F2S	NONE	NONE	
0/2	Spare	SIB F2S	NONE	NONE	
0/4	Spare	SIB F2S	NONE	NONE	
0/6	Spare	SIB F2S	NONE	NONE	
1/0	Online	SIB F2S	NONE	NONE	12 hours,
	6 minutes, 32 seconds				
1/2	Online	SIB F2S	NONE	NONE	12 hours,
	6 minutes, 31 seconds				
1/4	Online	SIB F2S	NONE	NONE	12 hours,
	6 minutes, 30 seconds				
1/6	Online	SIB F2S	NONE	NONE	12 hours,
	6 minutes, 29 seconds				
2/0	Online	SIB F2S	NONE	NONE	12 hours,
	6 minutes, 21 seconds				
2/2	Online	SIB F2S	NONE	NONE	12 hours,
	6 minutes, 20 seconds				
2/4	Online	SIB F2S	NONE	NONE	12 hours,
	6 minutes, 19 seconds				
2/6	Online	SIB F2S	NONE	NONE	12 hours,
	6 minutes, 17 seconds				
3/0	Online	SIB F2S	NONE	NONE	12 hours,
	6 minutes, 10 seconds				
3/2	Online	SIB F2S	NONE	NONE	12 hours,
	6 minutes, 9 seconds				
3/4	Online	SIB F2S	NONE	NONE	12 hours,
	6 minutes, 7 seconds				
3/6	Online	SIB F2S	NONE	NONE	12 hours,
	6 minutes, 6 seconds				
4/0	Online	SIB F2S	NONE	NONE	12 hours,
	5 minutes, 59 seconds				
4/2	Online	SIB F2S	NONE	NONE	12 hours,
	5 minutes, 57 seconds				
4/4	Online	SIB F2S	NONE	NONE	12 hours,
	5 minutes, 56 seconds				

4/6	Online	SIB F2S	NONE	NONE	12 hours, 5 minutes, 55 seconds
-----	--------	---------	------	------	---------------------------------

### show chassis sibs lcc (TX Matrix Plus Router)

```
user@host> show chassis sibs lcc 0
```

```
lcc0-re0:
```

Slot	State	Link errors	Destination errors	Uptime
0	Online	NONE	NONE	20 hours, 14 minutes, 50 seconds
1	Fault	NONE	NONE	
2	Online	NONE	NONE	20 hours, 15 minutes, 2 seconds
3	Online	NONE	NONE	20 hours, 14 minutes, 58 seconds
4	Online	NONE	NONE	20 hours, 14 minutes, 54 seconds

### show chassis sibs lcc (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis sibs lcc 0
```

```
lcc0-re0:
```

Slot	State	Cable errors	Link errors	Destination errors	Uptime
0	Disconnected	NONE	NONE	NONE	17 hours, 2 minutes, 37 seconds
1	Online	NONE	NONE	NONE	17 hours, 3 minutes, 6 seconds
2	Online	NONE	NONE	NONE	17 hours, 2 minutes, 59 seconds
3	Online	NONE	NONE	NONE	17 hours, 2 minutes, 52 seconds
4	Online	NONE	NONE	NONE	17 hours, 2 minutes, 44 seconds

### show chassis sibs (M320 Router)

```
user@host> show chassis sibs
```

0	Online	1 hour, 18 minutes, 3 seconds
1	Offline	--- Offlined by cli command ---
2	Online	1 hour, 18 minutes, 18 seconds
3	Online	1 hour, 18 minutes, 3 seconds

### show chassis sibs (PTX Series)

```
user@host> show chassis sibs
```

Slot	State	Fabric links	Errors
0	Online	Active	Asic Errors
1	Online	Active	Link Errors
2	Online	Active	None
3	Online	Active	Cell drops
4	Offline	Unused	None
5	Online	Active	None



6	Online	Active	None
7	Online	Active	None
8	Online	Active	None

#### show chassis sibs (PTX Series)

```
user@host> show chassis sibs detail
```

##### Slot 4 information

State	Offline
Reason	Offlined by cli command
Fabric links	Unused
Errors	None

## show chassis spmb

<b>List of Syntax</b>	<a href="#">Syntax on page 2136</a> <a href="#">Syntax (MX Series Routers) on page 2136</a> <a href="#">Syntax (T4000 Routers) on page 2136</a> <a href="#">Syntax (TX Matrix Routers) on page 2136</a> <a href="#">Syntax (TX Matrix Plus Routers) on page 2136</a>
<b>Syntax</b>	show chassis spmb
<b>Syntax (MX Series Routers)</b>	show chassis spmb <all-members> <local> <member <i>member-id</i> >
<b>Syntax (T4000 Routers)</b>	show chassis spmb <sibs>
<b>Syntax (TX Matrix Routers)</b>	show chassis spmb <sibs> <lcc <i>number</i>   scc>
<b>Syntax (TX Matrix Plus Routers)</b>	show chassis spmb <sibs> <lcc <i>number</i>   sfc <i>number</i> >
<b>Release Information</b>	<p>Command introduced before Junos OS Release 7.4.</p> <p><b>sibs</b> option introduced for the T1600 and TX Matrix Plus routers in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.</p> <p><b>all-members</b>, <b>local</b>, and <b>member <i>member-id</i></b> options introduced in Junos OS Release 15.1 for MX2020 and MX2010 routers.</p> <p>Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.</p>
<b>Description</b>	(T Series routers, MX2010, MX2020, and MX2008 routers only) Display Switch Processor Mezzanine Board (SPMB) status information.
<b>Options</b>	<p><b>none</b>—(TX Matrix, TX Matrix Plus router, MX2010, MX2020, and MX2008 routers only)</p> <p>On a TX Matrix router, display SPMB status for the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display SPMB status for the TX Matrix Plus router and its attached routers. On MX2010, MX2020, and MX2008 routers, display the SPMB status for the routers.</p>

**all-members**—(MX2010, MX2020, and MX2008 routers only) (Optional) Display status information for the SPMB in all members of the Virtual Chassis configuration.

**lcc number**—(TX Matrix and TX Matrix Plus router only) (Optional) On a TX Matrix router, display information about the SPMB on a specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display information about the SPMB on a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX2010, MX2020, and MX2008 routers only) (Optional) Display status information for the SPMB in the local member of the Virtual Chassis.

**member member-id**—(MX2010, MX2020, and MX2008 routers only) (Optional) Display status information for the SPMB in the specified member of the Virtual Chassis. Replace *member-id* with the value 0 or 1.

**scc**—(TX Matrix routers only) (Optional) Display information about the SPMB on the TX Matrix router (switch-card chassis).

**sfc number**—(TX Matrix Plus router only) (Optional) Display information about the SPMB on the TX Matrix Plus router (switch-fabric chassis). Replace *number* with 0.

**sibs**—(TX Matrix and TX Matrix Plus router only) (Optional) On a TX Matrix Plus router, display information about the SIBs on the TX Matrix router (switch-card chassis). On a TX Matrix Plus router, display information about the SIBs on The TX Matrix Plus router (switch-fabric chassis). The **sibs** option has the following sub-options:

**lcc number** (TX Matrix, TX Matrix Plus router only) (Optional) On a TX Matrix router, display information about the SIBs on a specified T640 router (line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display information about the SIBs on a specified router (line-card chassis) that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**scc number**—(TX Matrix routers only) (Optional) Display information about the SIBs on the TX Matrix router (switch-card chassis). Replace *number* variable with 0.

**sfc number**—(TX Matrix Plus router only) (Optional) Display information about the SIBs on the TX Matrix Plus router (switch-fabric chassis). Replace *number* variable with 0.

**Required Privilege Level**

view

**Related Documentation**

- [request chassis sib on page 898](#)
- [request chassis spmb restart on page 908](#)
- [show chassis spmb sibs on page 2147](#)

**List of Sample Output**

[show chassis spmb on page 2139](#)  
[show chassis spmb \(MX2010 Router\) on page 2139](#)  
[show chassis spmb \(MX2020 Router\) on page 2140](#)  
[show chassis spmb \(MX2008 Router\) on page 2140](#)  
[show chassis spmb \(T4000 Router\) on page 2140](#)  
[show chassis spmb lcc \(TX Matrix Router\) on page 2141](#)  
[show chassis spmb scc \(TX Matrix Router\) on page 2141](#)  
[show chassis spmb \(T1600 Router\) on page 2141](#)  
[show chassis spmb sibs \(T1600 Router\) on page 2141](#)  
[show chassis spmb \(TX Matrix Plus Router\) on page 2142](#)  
[show chassis spmb lcc \(TX Matrix Plus Router\) on page 2143](#)  
[show chassis spmb scc \(TX Matrix Plus Router\) on page 2144](#)  
[show chassis spmb sibs \(TX Matrix Plus Router\) on page 2144](#)  
[show chassis spmb lcc \(TX Matrix Plus router with 3D SIBs\) on page 2145](#)  
[show chassis spmb sfc \(TX Matrix Plus router with 3D SIBs\) on page 2146](#)

**Output Fields**

[Table 162 on page 2139](#) lists the output fields for the **show chassis spmb** command. Output fields are listed in the approximate order in which they appear.

Table 162: show chassis spmb Output Fields

Field Name	Field Description
Slot	SPMB slot number: 0 or 1.
State	SPMB status: <ul style="list-style-type: none"> <li>• <b>Online</b>—SPMB is operational and running.</li> <li>• <b>Offline</b>—SPMB is powered down.</li> </ul>
Total CPU Utilization (%)	Total percentage of CPU being used by the SPMB processor.
Interrupt CPU Utilization (%)	Of the total CPU being used by the SPMB processor, the percentage being used for interrupts.
Memory Heap Utilization (%)	Percentage of heap space (dynamic memory) being used by the FPC processor. If this number exceeds 80 percent, there may be a software problem (memory leak).
Buffer Utilization (%)	Percentage of buffer space being used by the SPMB processor for buffering internal messages.
Start time	Time at which the SPMB last came online.
Uptime	How long the SPMB has been up and running.

## Sample Output

### show chassis spmb

```

user@host> show chassis spmb

Slot 0 information:
  State                Online
  Total CPU Utilization 1%
  Interrupt CPU Utilization 0%
  Memory Heap Utilization 0%
  Buffer Utilization    40%
  Start time:          2001-08-27 14:05:04 PDT
  Uptime:               46 minutes, 36 seconds

```

### show chassis spmb (MX2010 Router)

```

user@host> show chassis spmb

Slot 0 information:
  State                Online
  Total CPU Utilization 12%
  Interrupt CPU Utilization 0%
  Memory Heap Utilization 1%
  Buffer Utilization    22%
  Start time:          2012-10-04 15:34:29 PDT
  Uptime:               7 hours, 10 minutes, 15 seconds
Slot 1 information:
  State                Online - Standby

```

```
Total CPU Utilization      1%
Interrupt CPU Utilization  0%
Memory Heap Utilization    0%
Buffer Utilization         22%
Start time:                2012-10-02 14:34:54 PDT
Uptime:                    2 days, 8 hours, 9 minutes, 50 seconds
```

### show chassis spmb (MX2020 Router)

```
user@host> show chassis spmb
```

```
Slot 0 information:
  State                Online
  Total CPU Utilization 100%
  Interrupt CPU Utilization 0%
  Memory Heap Utilization 3%
  Buffer Utilization    22%
  Start time:          2012-10-03 14:58:26 PDT
  Uptime:              1 day, 12 hours, 16 minutes, 14 seconds
Slot 1 information:
  State                Online - Standby
  Total CPU Utilization 0%
  Interrupt CPU Utilization 0%
  Memory Heap Utilization 0%
  Buffer Utilization    22%
  Start time:          2012-10-03 14:58:27 PDT
  Uptime:              1 day, 12 hours, 16 minutes, 13 seconds
```

### show chassis spmb (MX2008 Router)

```
user@host> show chassis spmb
```

```
Slot 0 information:
  State                Online
  Start time:          2017-05-04 02:53:36 PDT
  Uptime:              10 days, 7 hours, 1 minute, 14 seconds
Slot 1 information:
  State                Online - Standby
  Start time:          2017-05-04 02:53:36 PDT
  Uptime:              10 days, 7 hours, 1 minute, 14 seconds
```

### show chassis spmb (T4000 Router)

```
user@host> show chassis spmb
```

```
Slot 0 information:
  State                Online
  Total CPU Utilization 18%
  Interrupt CPU Utilization 0%
  Memory Heap Utilization 0%
  Buffer Utilization    22%
  Start time:          2012-02-09 22:51:09 PST
  Uptime:              2 hours, 25 minutes, 45 seconds
Slot 1 information:
  State                Online - Standby
  Total CPU Utilization 0%
  Interrupt CPU Utilization 0%
  Memory Heap Utilization 0%
```

```

Buffer Utilization      22%
Start time:            2012-02-09 22:51:10 PST
Uptime:                2 hours, 25 minutes, 44 seconds

```

### show chassis spmb lcc (TX Matrix Router)

```
user@host> show chassis spmb lcc 0
```

```
lcc0-re0:
```

```
-----
Slot 0 information:
```

```

State                  Online
Total CPU Utilization  0%
Interrupt CPU Utilization 0%
Memory Heap Utilization 0%
Buffer Utilization     42%
Start time:            2004-08-05 18:43:38 PDT
Uptime:                8 days, 55 minutes, 52 seconds

```

### show chassis spmb scc (TX Matrix Router)

```
user@host> show chassis spmb scc
```

```
scc-re0:
```

```
-----
Slot 0 information:
```

```

State                  Online
Total CPU Utilization  1%
Interrupt CPU Utilization 0%
Memory Heap Utilization 0%
Buffer Utilization     42%
Start time:            2004-08-05 18:43:37 PDT
Uptime:                8 days, 1 hour, 6 minutes, 51 seconds

```

### show chassis spmb (T1600 Router)

```
user@host> show chassis spmb
```

```
Slot 0 information:
```

```

State                  Online
Total CPU Utilization  2%
Interrupt CPU Utilization 0%
Memory Heap Utilization 0%
Buffer Utilization     24%
Start time:            2009-05-07 22:34:03 PDT
Uptime:                3 days, 4 hours, 14 minutes, 33 seconds

```

```
Slot 1 information:
```

```

State                  Online - Standby
Total CPU Utilization  0%
Interrupt CPU Utilization 0%
Memory Heap Utilization 0%
Buffer Utilization     24%
Start time:            2009-05-07 22:34:02 PDT
Uptime:                3 days, 4 hours, 14 minutes, 34 seconds

```

### show chassis spmb sibs (T1600 Router)

```
user@host> show chassis spmb sibs
```

Slot	State	Uptime
0	Check	3 days, 4 hours, 11 minutes, 59 seconds
1	Disconnected	3 days, 4 hours, 12 minutes, 36 seconds
2	Disconnected	3 days, 4 hours, 12 minutes, 26 seconds
3	Disconnected	3 days, 4 hours, 12 minutes, 17 seconds
4	Disconnected	3 days, 4 hours, 12 minutes, 8 seconds

### show chassis spmb (TX Matrix Plus Router)

```
user@host> show chassis spmb
```

```
sfc0-re0:
```

```
-----
```

```
Slot 0 information:
```

State	Online
Total CPU Utilization	84%
Interrupt CPU Utilization	0%
Memory Heap Utilization	0%
Buffer Utilization	24%
Start time:	2009-05-11 01:25:20 PDT
Uptime:	46 minutes, 6 seconds

```
Slot 1 information:
```

State	Online - Standby
Total CPU Utilization	0%
Interrupt CPU Utilization	0%
Memory Heap Utilization	0%
Buffer Utilization	24%
Start time:	2009-05-11 01:25:20 PDT
Uptime:	46 minutes, 6 seconds

```
lcc0-re1:
```

```
-----
```

```
Slot 0 information:
```

State	Online - Standby
Total CPU Utilization	0%
Interrupt CPU Utilization	0%
Memory Heap Utilization	0%
Buffer Utilization	24%
Start time:	2009-05-11 01:25:09 PDT
Uptime:	46 minutes, 24 seconds

```
Slot 1 information:
```

State	Online
Total CPU Utilization	5%
Interrupt CPU Utilization	0%
Memory Heap Utilization	0%
Buffer Utilization	24%
Start time:	2009-05-11 01:25:08 PDT
Uptime:	46 minutes, 25 seconds

```
lcc1-re1:
```

```
-----
```

```
Slot 0 information:
```

State	Online - Standby
Total CPU Utilization	1%
Interrupt CPU Utilization	0%
Memory Heap Utilization	0%
Buffer Utilization	24%
Start time:	2009-05-11 01:25:09 PDT
Uptime:	46 minutes, 24 seconds

```
Slot 1 information:
```



```

State                               Online
Total CPU Utilization               5%
Interrupt CPU Utilization            0%
Memory Heap Utilization              0%
Buffer Utilization                   24%
Start time:                         2009-05-11 01:25:10 PDT
Uptime:                             46 minutes, 23 seconds

```

lcc2-re1:

-----

Slot 0 information:

```

State                               Online - Standby
Total CPU Utilization               0%
Interrupt CPU Utilization            0%
Memory Heap Utilization              0%
Buffer Utilization                   24%
Start time:                         2009-05-11 01:25:08 PDT
Uptime:                             46 minutes, 25 seconds

```

Slot 1 information:

```

State                               Online
Total CPU Utilization               5%
Interrupt CPU Utilization            0%
Memory Heap Utilization              0%
Buffer Utilization                   24%
Start time:                         2009-05-11 01:25:10 PDT
Uptime:                             46 minutes, 23 seconds

```

lcc3-re1:

-----

Slot 0 information:

```

State                               Online - Standby
Total CPU Utilization               1%
Interrupt CPU Utilization            0%
Memory Heap Utilization              0%
Buffer Utilization                   24%
Start time:                         2009-05-11 01:25:10 PDT
Uptime:                             46 minutes, 23 seconds

```

Slot 1 information:

```

State                               Online
Total CPU Utilization               5%
Interrupt CPU Utilization            0%
Memory Heap Utilization              0%
Buffer Utilization                   24%
Start time:                         2009-05-11 01:25:09 PDT
Uptime:                             46 minutes, 24 seconds

```

### show chassis spmb lcc (TX Matrix Plus Router)

```
user@host> show chassis spmb lcc 2
```

lcc2-re1:

-----

Slot 0 information:

```

State                               Online - Standby
Total CPU Utilization               0%
Interrupt CPU Utilization            0%
Memory Heap Utilization              0%
Buffer Utilization                   24%
Start time:                         2009-05-11 01:25:08 PDT
Uptime:                             45 minutes, 18 seconds

```

```

Slot 1 information:
  State                Online
  Total CPU Utilization 6%
  Interrupt CPU Utilization 0%
  Memory Heap Utilization 0%
  Buffer Utilization    24%
  Start time:          2009-05-11 01:25:10 PDT
  Uptime:              45 minutes, 16 seconds

```

#### show chassis spmb scc (TX Matrix Plus Router)

```

user@host> show chassis spmb sfc 0
sfc0-re0:
-----
Slot 0 information:
  State                Online
  Total CPU Utilization 87%
  Interrupt CPU Utilization 0%
  Memory Heap Utilization 0%
  Buffer Utilization    24%
  Start time:          2009-05-11 01:25:20 PDT
  Uptime:              43 minutes, 32 seconds
Slot 1 information:
  State                Online - Standby
  Total CPU Utilization 0%
  Interrupt CPU Utilization 0%
  Memory Heap Utilization 0%
  Buffer Utilization    24%
  Start time:          2009-05-11 01:25:20 PDT
  Uptime:              43 minutes, 32 seconds

```

#### show chassis spmb sibs (TX Matrix Plus Router)

```

user@host> show chassis spmb sibs
sfc0-re0:
-----

```

Slot	State	Type	Uptime
0	Online	SIB F13	1 hour, 18 minutes, 54 seconds
1	Online	SIB F13	1 hour, 18 minutes, 45 seconds
2	Invalid		
3	Online	SIB F13	1 hour, 20 minutes, 21 seconds
4	Online	SIB F13	1 hour, 20 minutes, 18 seconds
5	Invalid		
6	Online	SIB F13	1 hour, 19 minutes, 51 seconds
7	Fault	SIB F13	
8	Online	SIB F13	1 hour, 19 minutes, 17 seconds
9	Online	SIB F13	1 hour, 19 minutes, 13 seconds
10	Invalid		
11	Online	SIB F13	1 hour, 17 minutes, 54 seconds
12	Online	SIB F13	1 hour, 17 minutes, 51 seconds
13	Invalid		
14	Invalid		
15	Invalid		
0/0	Online	SIB F2S	1 hour, 18 minutes, 52 seconds
0/2	Online	SIB F2S	1 hour, 18 minutes, 51 seconds
0/4	Online	SIB F2S	1 hour, 18 minutes, 49 seconds
0/6	Online	SIB F2S	1 hour, 18 minutes, 48 seconds

1/0	Online	SIB F2S	1 hour, 20 minutes, 16 seconds
1/2	Online	SIB F2S	1 hour, 20 minutes, 15 seconds
1/4	Online	SIB F2S	1 hour, 20 minutes, 14 seconds
1/6	Online	SIB F2S	1 hour, 20 minutes, 13 seconds
2/0	Online	SIB F2S	1 hour, 19 minutes, 48 seconds
2/2	Online	SIB F2S	1 hour, 19 minutes, 47 seconds
2/4	Online	SIB F2S	1 hour, 19 minutes, 46 seconds
2/6	Online	SIB F2S	1 hour, 19 minutes, 44 seconds
3/0	Online	SIB F2S	1 hour, 19 minutes, 24 seconds
3/2	Online	SIB F2S	1 hour, 19 minutes, 22 seconds
3/4	Online	SIB F2S	1 hour, 19 minutes, 21 seconds
3/6	Online	SIB F2S	1 hour, 19 minutes, 20 seconds
4/0	Online	SIB F2S	1 hour, 18 minutes, 2 seconds
4/2	Online	SIB F2S	1 hour, 18 minutes
4/4	Online	SIB F2S	1 hour, 17 minutes, 58 seconds
4/6	Online	SIB F2S	1 hour, 17 minutes, 58 seconds

lcc0-re1:

Slot	State	Uptime
0	Online	1 hour, 18 minutes, 58 seconds
1	Online	1 hour, 20 minutes, 25 seconds
2	Fault	
3	Online	1 hour, 18 minutes, 30 seconds
4	Online	1 hour, 18 minutes, 28 seconds

lcc1-re1:

Slot	State	Uptime
0	Online	1 hour, 18 minutes, 58 seconds
1	Online	1 hour, 20 minutes, 26 seconds
2	Fault	
3	Online	1 hour, 18 minutes, 22 seconds
4	Online	1 hour, 18 minutes, 20 seconds

lcc2-re1:

Slot	State	Uptime
0	Online	1 hour, 18 minutes, 19 seconds
1	Online	1 hour, 20 minutes, 25 seconds
2	Fault	
3	Online	1 hour, 18 minutes, 17 seconds
4	Online	1 hour, 18 minutes, 15 seconds

lcc3-re1:

Slot	State	Uptime
0	Online	1 hour, 18 minutes, 27 seconds
1	Online	1 hour, 20 minutes, 24 seconds
2	Fault	
3	Online	1 hour, 18 minutes, 25 seconds
4	Online	1 hour, 18 minutes, 23 seconds

### show chassis spmb lcc (TX Matrix Plus router with 3D SIBs)

```
user@host > show chassis spmb lcc 0
```

lcc0-re1:

Slot 0 information:

```

State                               Online - Standby
Total CPU Utilization               0%
Interrupt CPU Utilization            0%
Memory Heap Utilization              0%
Buffer Utilization                   0%
Start time:                         2013-02-08 00:57:20 PST
Uptime:                             19 minutes, 43 seconds
Slot 1 information:
State                               Online
Total CPU Utilization               0%
Interrupt CPU Utilization            0%
Memory Heap Utilization              0%
Buffer Utilization                   22%
Start time:                         2013-02-08 00:56:59 PST
Uptime:                             20 minutes, 4 seconds

```

### show chassis spmb sfc (TX Matrix Plus router with 3D SIBs)

```
user@host> show chassis spmb sfc o
```

```
sfc0-re0:
```

```

-----
Slot 0 information:
State                               Online
Total CPU Utilization               0%
Interrupt CPU Utilization            0%
Memory Heap Utilization              0%
Buffer Utilization                   0%
Start time:                         2013-02-06 19:16:55 PST
Uptime:                             1 day, 6 hours, 2 minutes, 59 seconds
Slot 1 information:
State                               Online - Standby
Total CPU Utilization               0%
Interrupt CPU Utilization            0%
Memory Heap Utilization              0%
Buffer Utilization                   0%
Start time:                         2013-02-06 19:16:53 PST
Uptime:                             1 day, 6 hours, 3 minutes, 1 second

```

## show chassis spmb sibs

<b>List of Syntax</b>	<a href="#">Syntax on page 2147</a> <a href="#">Syntax (TX Matrix Router) on page 2147</a> <a href="#">Syntax (TX Matrix Plus Router) on page 2147</a>
<b>Syntax</b>	show chassis spmb sibs
<b>Syntax (TX Matrix Router)</b>	show chassis spmb sibs <lcc <i>number</i>   scc>
<b>Syntax (TX Matrix Plus Router)</b>	show chassis spmb sibs <lcc <i>number</i>   sfc <i>number</i> >
<b>Release Information</b>	Command introduced before Junos OS Release 7.4. sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.
<b>Description</b>	(T Series routers only) Display Switch Processor Mezzanine Board (SPMB) Switch Interface Board (SIB) status information.
<b>Options</b>	<p><b>none</b>—(TX Matrix and TX Matrix Plus routers only) On a TX Matrix router, display the SIB status for the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display the SIB status for the TX Matrix Plus router and its attached routers.</p> <p><b>lcc <i>number</i></b>—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display SIB status information for a specified T640 router (line-card chassis) that is connected to a TX Matrix router. On a TX Matrix Plus router, display SIB status information for a specified router (line-card chassis) that is connected to a TX Matrix Plus router.</p> <p>Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> <li>• 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.</li> <li>• 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.</li> <li>• 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> <li>• 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.</li> </ul> <p><b>scc</b>—(TX Matrix router only) (Optional) Display SIB status information for the TX Matrix router (switch-card chassis).</p>

**sfc**—(TX Matrix Plus router only) (Optional) Display SIB status information for the TX Matrix Plus router (or switch-fabric chassis).

**Additional Information** On a T Series router, you can use either this command or the **show chassis sibs** command to produce the same output. The **show chassis sibs** command is supported on the M320 router and on the T Series routers.

**Required Privilege Level** view

**Related Documentation**

- [show chassis sibs on page 2124](#)
- [request chassis sib on page 898](#)
- [request chassis spmb restart on page 908](#)

**List of Sample Output**

- [show chassis spmb sibs \(T320 Router\) on page 2149](#)
- [show chassis-spmb-sibs \(T1600 Router\) on page 2149](#)
- [show chassis spmb sibs \(T4000 Router\) on page 2150](#)
- [show chassis spmb sibs \(TX Matrix Router\) on page 2150](#)
- [show chassis spmb sibs lcc \(TX Matrix Router\) on page 2150](#)
- [show chassis spmb sibs scc \(TX Matrix Router\) on page 2150](#)
- [show chassis spmb sibs \(TX Matrix Plus Router\) on page 2150](#)
- [show chassis spmb sibs sfc \(TX Matrix Plus Router\) on page 2151](#)

**Output Fields** [Table 163 on page 2148](#) lists the output fields for the **show chassis spmb sibs** command. Output fields are listed in the approximate order in which they appear.

*Table 163: show chassis spmb sibs Output Fields*

Field Name	Field Description
Slot	<p>SIB slot number:</p> <ul style="list-style-type: none"> <li>• T640 router, T1600 router or TX Matrix router—0 through 4</li> <li>• TX Matrix Plus router: <ul style="list-style-type: none"> <li>• TXP-F13 SIB Slots—0 through 16</li> <li>• TXP-F2S SIB Slots —0 – 4/[0 2 4 6]</li> </ul> </li> <li>• T320 router—0 through 2</li> </ul>

Table 163: show chassis spmb sibs Output Fields (continued)

Field Name	Field Description
<b>State</b>	<p>SIB status:</p> <ul style="list-style-type: none"> <li>• <b>Disconnected</b>—SIBs on all T640 routers on the TX Matrix router (switch-card chassis) are in the <b>Disconnected</b> state, because a SIB on the SCC has gone offline. Likewise, SIBs on all T1600 or T4000 routers on the TX Matrix Plus router (or switch-fabric chassis) are in the <b>Disconnected</b> state, because a SIB on the SFC has gone offline.</li> <li>• <b>Online</b>—SPMB is operational and running.</li> <li>• <b>Offline</b>—SPMB is powered down.</li> <li>• <b>Spare</b>—SIB is redundant and will move to active state if one of the working SIBs fail to pass traffic.</li> <li>• <b>Empty</b>—No SPMB is present.</li> <li>• <b>Fault</b>—SIB is in alarmed state where the SIB's plane is not operational for the following reasons: <ul style="list-style-type: none"> <li>• On-board F-chip is not operational.</li> <li>• Fiber optic connector faults.</li> <li>• FPC connector faults.</li> <li>• SIB midplane connector faults.</li> </ul> </li> <li>• <b>Check</b>—SIB is in alarmed state where the SIB's plane is partially operational for the following reasons: <ul style="list-style-type: none"> <li>• SIB is not inserted properly.</li> <li>• Two or more links between the SIB and PFE fails.</li> </ul> </li> </ul>
<b>Uptime</b>	How long the SIB has been up and running.

## Sample Output

### show chassis spmb sibs (T320 Router)

```
user@host> show chassis spmb sibs
```

```
Slot  State
0      Spare
1      Online
2      Online
```

### show chassis-spmb-sibs (T1600 Router)

```
user@host> show chassis spmb sibs
```

```
Slot  State
0      Spare
1      Online
2      Empty
3      Online
4      Offline
```

### show chassis spmb sibs (T4000 Router)

```
user@host> show chassis spmb sibs
```

Slot	State	Uptime
0	Spare	
1	Online	2 hours, 28 minutes, 13 seconds
2	Online	2 hours, 27 minutes, 57 seconds
3	Online	2 hours, 27 minutes, 40 seconds
4	Online	2 hours, 27 minutes, 24 seconds

### show chassis spmb sibs (TX Matrix Router)

```
user@host> show chassis spmb sibs
```

Slot	State
0	Online
1	Online
2	Empty
3	Online
4	Offline

### show chassis spmb sibs lcc (TX Matrix Router)

```
user@host> show chassis spmb sibs lcc 0
```

```
lcc0-re0:
```

Slot	State	Uptime
0	Empty	
1	Empty	
2	Empty	
3	Disconnected	8 days, 48 minutes, 58 seconds
4	Online	8 days, 48 minutes, 57 seconds

### show chassis spmb sibs scc (TX Matrix Router)

```
user@host> show chassis spmb sibs scc
```

```
scc-re0:
```

Slot	State	Uptime
0	Empty	
1	Empty	
2	Empty	
3	Offline	
4	Online	8 days, 54 minutes, 1 second

### show chassis spmb sibs (TX Matrix Plus Router)

```
user@host> show chassis spmb sibs
```

```
sfc0-re0:
```

Slot	State	Type	Uptime
0	Online	SIB F13	1 hour, 52 minutes, 55 seconds
1	Empty		
2	Invalid		



```

3   Online           SIB F13      1 hour, 53 minutes, 3 seconds
4   Empty
5   Invalid
6   Empty
7   Empty
8   Empty
9   Empty
10  Invalid
11  Empty
12  Empty
13  Invalid
14  Invalid
15  Invalid
0/0 Online           SIB F2S      1 hour, 53 minutes, 2 seconds
0/2 Online           SIB F2S      1 hour, 53 minutes, 1 second
0/4 Online           SIB F2S      1 hour, 52 minutes, 59 seconds
0/6 Online           SIB F2S      1 hour, 52 minutes, 58 seconds
1/0 Online           SIB F2S      1 hour, 53 minutes, 10 seconds
1/2 Online           SIB F2S      1 hour, 53 minutes, 8 seconds
1/4 Online           SIB F2S      1 hour, 53 minutes, 7 seconds
1/6 Online           SIB F2S      1 hour, 53 minutes, 6 seconds
2/0 Empty
2/2 Empty
2/4 Empty
2/6 Empty
3/0 Empty
3/2 Empty
3/4 Empty
3/6 Empty
4/0 Empty
4/2 Empty
4/4 Empty
4/6 Empty

```

lcc0-re0:

```

-----
Slot State           Uptime
0   Online           1 hour, 53 minutes, 1 second
1   Online           1 hour, 53 minutes, 3 seconds
2   Empty
3   Empty
4   Empty

```

lcc1-re1:

```

-----
Slot State           Uptime
0   Online           1 hour, 47 minutes, 13 seconds
1   Online           1 hour, 47 minutes, 15 seconds
2   Empty
3   Empty
4   Empty

```

### show chassis spmb sibs sfc (TX Matrix Plus Router)

```
user@host> show chassis spmb sibs sfc 0
```

sfc0-re0:

```

-----
Slot 0 information:
State                Online

```

```
Total CPU Utilization      16%
Interrupt CPU Utilization   0%
Memory Heap Utilization    0%
Buffer Utilization         24%
Start time:                2009-06-17 20:59:47 PDT
Uptime:                    1 hour, 56 minutes, 30 seconds

Slot 1 information:
State                      Online - Standby
Total CPU Utilization      0%
Interrupt CPU Utilization   0%
Memory Heap Utilization    0%
Buffer Utilization         24%
Start time:                2009-06-17 20:59:48 PDT
Uptime:                    1 hour, 56 minutes, 29 seconds
```

## show chassis synchronization

**List of Syntax**    [Syntax on page 2153](#)  
                           [Syntax \(on ACX500 Series\) on page 2153](#)  
                           [Syntax \(on EX9251 Switches\) on page 2153](#)

**Syntax**    show chassis synchronization  
                   <clock-module> <(re0 | re1 | routing-engine (backup | both | local | master | other))>>  
                   <extensive>  
                   <backup | master>  
                   <interface *interface-name*>

**Syntax (on ACX500 Series)**    show chassis synchronization  
   <gnss>  
   <extensive>  
   <backup | master>

**Syntax (on EX9251 Switches)**    show chassis synchronization  
   <clock-module>  
   <extensive>  
   <interface *interface-name*>

**Release Information**    Command introduced in Junos OS Release 7.6 for M320 routers.  
                                   Command introduced in Junos OS Release 8.3 for M40e routers.  
                                   Command introduced in Junos OS Release 9.3 for M120 routers.  
                                   Command introduced in Junos OS Release 10.2 for T320, T640, and T1600 routers.  
                                   Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Routers.  
                                   Command introduced in Junos OS Release 12.2 for ACX Series routers.  
                                   Command introduced in Junos OS Release 12.3X54–D20 for ACX500 Series routers.  
                                   Command introduced in Junos OS Release 17.2 for PTX10008 Routers.  
                                   Command introduced in Junos OS Release 18.1R1 for EX9251 Switches.

**Description**    (ACX Series, M320, M40e, M120, T320, T640, and T1600 routers and PTX Series Packet Transport Routers only) Display information about the external clock source currently used for chassis synchronization.

**Options**    **clock-module**—Display clock module information. You can optionally specify one of these Routing Engine qualifiers:

**re0**—Routing Engine 0

**re1**—Routing Engine 1

**routing-engine (backup | both | local | master | other)**—Routing Engine type

**extensive**—(Optional) Display clock synchronization information in detail.

**interface *interface-name***—(Optional) Display clock synchronization information for the specified interface.

**backup**—(Optional) Display clock synchronization information about the backup clock.

**master**— (Optional) Display clock synchronization information about the master clock.

**Required Privilege Level** maintenance

**Related Documentation**

- [request chassis synchronization switch on page 912](#)
- [Configuring Clock Synchronization Interface on MX Series Routers on page 293](#)
- [Supported Time Synchronization Standard](#)
- [Configuring External Clock Synchronization for ACX Series Routers](#)

**List of Sample Output**

[show chassis synchronization on page 2155](#)  
[show chassis synchronization master on page 2156](#)  
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[show chassis synchronization \(T320, T640, and T1600 Routers\) on page 2157](#)  
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[show chassis synchronization gnss \(ACX500 Series Routers\) on page 2159](#)  
[show chassis synchronization gnss extensive \(ACX500 Series Routers\) on page 2159](#)  
[show chassis synchronization clock-module \(EX9251 Switches\) on page 2160](#)

**Output Fields** [Table 164 on page 2154](#) lists the output fields for the **show chassis synchronization** command. Output fields are listed in the approximate order in which they appear.  
[show chassis synchronizations](#)  
[show chassis synchronizations](#)  
[show chassis synchronization](#)

**Table 164: show chassis synchronization Output Fields**

Field Name	Field Description
Current state	<p>Indicates current status of external clock sources:</p> <ul style="list-style-type: none"> <li>• backup—Source is currently the backup clock source.</li> <li>• master—Source is currently the master clock source.</li> <li>• Online-Master—(PTX Series Packet Transport Routers) Source is the master clock. Source is online.</li> <li>• Online-Standby—(PTX Series Packet Transport Routers) Source is the standby (backup) clock. Source is online.</li> </ul>

Table 164: *show chassis synchronization Output Fields (continued)*

Field Name	Field Description
Current clock state	Indicates current source of external synchronization: <ul style="list-style-type: none"> <li>internal—Source is providing its own clocking.</li> <li>locked to master CB—(M320, M40e, and M120 routers) Source is locked to master clock source.</li> <li>locked to master SCG—(T320, T640, and T1600 routers) Source is locked to master clock source.</li> <li>locked to master CCG—(PTX Series Packet Transport Routers) Source is locked to master clock source.</li> </ul>
SNMP trap status	Denotes the SNMP trap generation status (Enabled or Disabled) on ACX Series routers.
Selected for	Number of seconds this clock has been the master or backup clock source.
Selected since	Timestamp for establishment as master or backup clock source.
Deviation (in ppm)	Difference in clock timing, in parts per million (ppm). <p><b>NOTE:</b> Starting in Junos OS Release 16.1R2, if the clock source is locked and the deviation exceeds 10 ppm, the status of the configured source is displayed in the command output as <b>in-use</b>. This status indicates that the clock source is locked even though the clock has significant deviation.</p>
Last deviation (in ppm)	Previous difference in clock timing, if any, in ppm.
Configured sources	Information about clock sources eligible for selection as master clock.
Source	Information about external clock sources.
Priority	Indicates priority of external clock sources: <ul style="list-style-type: none"> <li>primary—Source is a primary reference.</li> <li>secondary—Source is a secondary reference.</li> </ul>
Deviation (in ppm)	Current difference in clock timing, in ppm: <ul style="list-style-type: none"> <li>measuring—Establishing source deviation.</li> <li>number—Deviation in ppm.</li> </ul>
Last deviation (in ppm)	Previous difference in clock timing, in ppm: <ul style="list-style-type: none"> <li>number—Deviation in ppm.</li> </ul>
Status	Indicates status of external sources: <ul style="list-style-type: none"> <li>present—Source is configured and present.</li> <li>qualified—Source is eligible for synchronization source.</li> </ul>

## Sample Output

### show chassis synchronization

```
user@host> show chassis synchronization
```

```

Clock Synchronization Status :
  Clock module on CB 0
    Current state      : master
    Current clock state : internal
    Selected for       : 18 hours, 12 minutes, 43 seconds
    Selected since     : 2008-09-10 03:27:47 PDT
    Deviation (in ppm) : +0.00
    Last deviation (in ppm): +0.00
Clock Synchronization Status :
  Clock module on CB 1
    Current state      : backup
    Current clock state : locked to master CB
    Selected for       : 1 day, 12 hours, 49 minutes, 20 seconds
    Selected since     : 2008-09-09 08:51:10 PDT

```

### show chassis synchronization master

```

user@host> show chassis synchronization master

Clock Synchronization Status :
  Clock module on CB 0
    Current state      : master
    Current clock state : internal
    Selected for       : 8 days, 21 minutes, 12 seconds
    Selected since     : 2008-08-27 21:05:40 PDT
    Deviation (in ppm) : +0.00
    Last deviation (in ppm): +0.00

```

### show chassis synchronization backup

```

user@host> show chassis synchronization backup

Clock Synchronization Status :
  Clock module on CB 1
    Current state      : backup
    Current clock state : locked to master CB
    Selected for       : 34 days, 20 hours, 17 minutes, 8 seconds
    Selected since     : 2008-08-01 01:22:16 PDT

```

### show chassis synchronization extensive

```

user@host> show chassis synchronization extensive

Clock Synchronization Status :
  Clock module on CB 0
    Current state      : master
    Current clock state : internal
    Selected for       : 8 days, 36 minutes, 29 seconds
    Selected since     : 2008-08-27 21:05:40 PDT
    Deviation (in ppm) : +0.00
    Last deviation (in ppm): +0.00
Clock Synchronization Status :
  Clock module on CB 1
    Current state      : backup
    Current clock state : locked to master CB
    Selected for       : 34 days, 20 hours, 19 minutes, 53 seconds
    Selected since     : 2008-08-01 01:22:16 PDT

```

### show chassis synchronization (T320, T640, and T1600 Routers)

```
user@host> show chassis synchronization
```

```

Clock Synchronization Status :
  Clock module on SCG 0
    Current state           : master
    Current clock state     : locked to external-a
    Selected for            : 2 hours, 28 minutes, 4 seconds
    Selected since          : 2006-02-17 01:12:58 PST
  Configured sources
    Source      Priority  Deviation    Last deviation  Status
                   (in ppm)    (in ppm)
    external-a  primary   measuring    -0.10           in-use
    external-b  secondary -0.10        -0.10           qualified
Clock Synchronization Status :
  Clock module on SCG 1
    Current state           : backup
    Current clock state     : locked to master SCG
    Selected for            : 19 hours, 49 minutes, 14 seconds
    Selected since          : 2006-02-16 07:51:48 PST
  Configured sources
    Source      Priority  Deviation    Last deviation  Status
                   (in ppm)    (in ppm)
    external-a  primary   -0.25        -0.25           qualified
    external-b  secondary -0.25        -0.25           qualified

```

### show chassis synchronization (PTX Series Packet Transport Routers)

```
user@host> show chassis synchronization
```

```

Clock Synchronization Status :
  Clock module on CCG 0
    Current state           : Online - Master
    Current clock state     : internal
    Selected for            : 1 hour, 24 minutes, 21 seconds
    Selected since          : 2011-03-21 15:59:37 PDT
    Deviation (in ppm)     : +0.51
    Last deviation (in ppm): +0.51
Clock Synchronization Status :
  Clock module on CCG 1
    Current state           : Online - Standby
    Current clock state     : locked to master CCG
    Selected for            : 1 hour, 39 minutes, 12 seconds
    Selected since          : 2011-03-21 15:44:46 PDT

```

### show chassis synchronization clock-module (PTX Series Packet Transport Routers)

```
user@host> show chassis synchronization clock-module
```

```
re0:
```

```

-----
Clock Synchronization Status :
  Clock module on CCG 0
    Current state           : Online - Master
    Current clock state     : locked to bits-a
    Selected for            : 1 minute, 24 seconds
    Selected since          : 2015-06-22 15:01:33 PDT
    Deviation (in ppm)     : unknown
    Last deviation (in ppm): unknown

```

```

Configured sources
Source      Priority  Deviation    Last deviation  Status
              (in ppm)      (in ppm)
ro
  bits-a    primary  unknown      unknown         unknown
  fpc-2     secondary unknown      unknown         unknown
Clock Synchronization Status :
Clock module on CCG 1
Current state      : Online - Standby
Current clock state : locked to master CCG
Selected for       : 1 hour, 39 minutes, 52 seconds
Selected since     : 2015-06-22 13:23:05 PDT
Deviation (in ppm) : unknown
Last deviation (in ppm): unknown
Configured sources
Source      Priority  Deviation    Last deviation  Status
              (in ppm)      (in ppm)
  bits-a    primary  unknown      unknown         unknown
  fpc-2     secondary unknown      unknown         unknown

```

This following sample output displays the status of configured sources as **in-use#**. This status indicates that the clock source is locked even though the clock has significant deviation in timing.

```
user@host> show chassis synchronization clock-module
```

```

re0:
-----
Clock Synchronization Status :
Clock module on CB 0
Current state      : Online - Master
Current clock state : locked to fpc-12
Selected for       : 7 seconds
Selected since     : 2016-08-16 09:39:07 PDT
Deviation (in ppm) : 10.00
Last deviation (in ppm): 8.75
Configured sources
Source      Priority  Deviation    Last deviation  Status
              (in ppm)      (in ppm)
  fpc-12    primary  10.00        8.75           in-use#

```

### show chassis synchronization extensive (ACX Series Routers)

```
user@host> show chassis synchronization extensive
```

```

Current clock status : Locked
Clock locked to      : Primary
SNMP trap status    : Enabled

Configured sources:

Interface           : ge-0/0/7
Status              : Secondary      Index       : 136
Clock source state   : Clk qualified Priority    : 3
Configured QL        : SEC              ESMC QL     : PRC
Clock source type    : ifd              Clock Event : Clock qualified
Interface State      : Up,sec,ESMC Rx(SSM 0x2),ESMC TX(QL PRC/SSM 0x2),

```



```

Interface      : ge-0/1/1
Status         : Primary      Index      : 138
Clock source state : Clk qualified Priority : 2
Configured QL   : SEC         ESMC QL    : PRC
Clock source type : ifd         Clock Event : Clock locked
Interface State  : Up,pri,ESMC Rx(SSM 0x2),ESMC TX(QL DNU/SSM 0xf)

```

### show chassis synchronization extensive (ACX500 Series Routers)

```
user@host> show chassis synchronization extensive
```

```

Current clock status : Locked
Clock locked to      : Primary

```

Configured ports:

```

Name           : gnss
Current ToD     : Mon Aug 10 08:50:52 2015
Last ToD update : Mon Aug 10 08:50:51 2015
GPS receiver status : Synchronized
UTC Pending     : FALSE
UTC Offset      : 36

```

One PPS status : Active

### show chassis synchronization gnss (ACX500 Series Routers)

```
user@host> show chassis synchronization gnss
```

```

Receiver Status      : Good
Constellation        : GPS & GLONASS
Cable delay compensation : 0
Antenna Status       : GPS Antenna Good

```

### show chassis synchronization gnss extensive (ACX500 Series Routers)

```
user@host> show chassis synchronization gnss extensive
```

```

Receiver Status      : Good
Constellation        : GPS & GLONASS
Cable delay compensation : 0
Antenna Status       : GPS Antenna Good
Position             : 12 56' 35.740410'' N   : 77 41' 32.228191'' E
Altitude             : 841 meters
Number of satellites : 17
Satellite List:

```

Sat No	Signal Level	Status	Type	Mode(T=Timing/P=Position)
17	34 dBHZ	Acquired	GPS	T,P
24	38 dBHZ	Acquired	GPS	T,P
12	31 dBHZ	Acquired	GPS	T,P
2	37 dBHZ	Acquired	GPS	T,P
5	48 dBHZ	Acquired	GPS	T,P
20	35 dBHZ	Acquired	GPS	T,P
28	42 dBHZ	Acquired	GPS	T,P
6	40 dBHZ	Acquired	GPS	T,P

71	41	dBHZ	Acquired	GLONASS	T,P
70	46	dBHZ	Acquired	GLONASS	T,P
76	36	dBHZ	Acquired	GLONASS	T,P
75	45	dBHZ	Acquired	GLONASS	T,P
72	40	dBHZ	Acquired	GLONASS	T,P
15	18	dBHZ	Acquired	GPS	NONE
13	36	dBHZ	Acquired	GPS	NONE
74	41	dBHZ	Acquired	GLONASS	NONE
77	19	dBHZ	Acquired	GLONASS	NONE

#### show chassis synchronization clock-module (EX9251 Switches)

```
user@switch> show chassis synchronization clock-module
```

```
re0:
```

```
-----  
Clock module on SCB0  
Current role      : master
```

## show chassis synchronization (MX Series Routers)

**Syntax**    show chassis synchronization  
              <clock-module <(re0 | re1 | routing-engine (backup | both | local | master | other))>>  
              <extensive>  
              <interface *interface-name*>

**Release Information**    Command introduced in Junos OS Release 10.4.  
                              Command introduced in Junos OS Release 13.3 for MX2020 routers.  
                              **clock-module** option introduced in Junos OS Release 12.2.  
                              Command introduced in Junos OS Release 17.3R1 for MX10003 Universal Routing Platforms.  
                              Command introduced in Junos OS Release 17.4 for MX204 Universal Routing Platforms.

**Description**    Display information about clocks used for chassis synchronization.



**NOTE:** In hybrid mode, the EEC in the MPC derives frequency synchronization from Synchronous Ethernet and the phase and time of day from PTP; however, the **show chassis synchronization extensive** operational mode command output displays the lock status that is derived from the EEC located on the SCB.

**NOTE:**

The Switch Control Board (SCB) framer in MX Series routers supports only the first-generation Synchronization Status Message (SSM) format. Therefore, whenever the router needs to transmit an SSM value of `st3e` or `tnc` via an external interface, an SSM value of `st3` is transmitted. However, on a Synchronous Ethernet interface, an ESMC packet with the unadjusted SSM is transmitted. The term *unadjusted* here means:

- If the `receive-quality` statement at the `[edit chassis synchronization selection-mode]` hierarchy level is configured, the originally received SSM value `st3e` or `tnc` (corresponding to the currently active Synchronous Ethernet clock interface) is transmitted.
- If the configured `quality` statement at the `[edit chassis synchronization selection-mode]` hierarchy level is configured, the originally configured SSM value of `st3e` or `tnc` (corresponding to the currently active Synchronous Ethernet clock interface) is transmitted.

Note that when the external interface receives an SSM value of either `st3e` or `tnc`, the SCB framer does not recognize either of these SSM codes, and therefore, it reports that the Do Not Use (DNU) quality value has been received.

SCBE2 does not support SSM when you configure the following framing format values on the external interface at the `[edit chassis synchronization interfaces external]` hierarchy level:

- `sf` for the `t1-options` statement
- `g704-no-crc` for the `e1-options` statement

**Options** **clock-module**—(MX240, MX480, MX960, MX10003, MX204, MX2010, MX2020, and MX2008 routers with Enhanced MX Switch Control Board; ) (Optional) Display clock module information. You can optionally specify one of these Routing Engine qualifiers:

**re0**—Routing Engine 0

**re1**—Routing Engine 1

**routing-engine (backup | both | local | master | other)**—Routing Engine type

**extensive**—(Optional) Display clock synchronization information in detail.

**interface *interface-name***—(Optional) Display clock synchronization information for the specified interface.

**Required Privilege Level** maintenance

- Related Documentation**
- [Configuring an External Clock Synchronization Interface for MX Series Routers on page 293](#)
  - [Configuring External Clock Synchronization for ACX Series Routers](#)
  - [Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 316](#)
  - [request chassis synchronization mode on page 910](#)
  - [show chassis synchronization on page 2153](#)
  - [synchronization \(MX Series\) on page 794](#)
  - [Synchronous Ethernet Overview on page 242](#)

- List of Sample Output**
- [show chassis synchronization on page 2167](#)
  - [show chassis synchronization extensive on page 2167](#)
  - [show chassis synchronization extensive \(Synchronous Ethernet with link down\) on page 2168](#)
  - [show chassis synchronization extensive \(Synchronous Ethernet with physical interface not restored\) on page 2168](#)
  - [show chassis synchronization extensive \(Synchronous Ethernet configured on ineligible slot 10\) on page 2168](#)
  - [show chassis synchronization extensive \(on MX104 Router\) on page 2169](#)
  - [show chassis synchronization clock-module \(MX10003 Router\) on page 2169](#)
  - [show chassis synchronization clock-module \(MX204 Router\) on page 2170](#)
  - [show chassis synchronization interface on page 2170](#)
  - [show chassis synchronization clock-module on page 2170](#)
  - [show chassis synchronization \(configured external clock interface\) on page 2171](#)
  - [show chassis synchronization clock-module \(configured external clock interface\) on page 2171](#)
  - [show chassis synchronization extensive \(configured external clock interface\) on page 2171](#)
  - [show chassis synchronization clock-module \(configured external clock interfaces\) on page 2172](#)
  - [show chassis synchronization extensive \(configured external clock interface\) on page 2172](#)

- Output Fields** [Table 165 on page 2163](#) lists the output fields for the **show chassis synchronization** command. Output fields are listed in the approximate order in which they appear.

*Table 165: show chassis synchronization Output Fields*

Field Name	Field Description	Level of Output
<b>Current clock status</b>	Indicates the current status of chassis synchronization: <ul style="list-style-type: none"> <li>• <b>Locked</b>—Clock is operational.</li> <li>• <b>Holdover</b>—Clock is not operational.</li> <li>• <b>Freerun</b>—Clock is locked to the free-run local oscillator.</li> </ul>	none

Table 165: show chassis synchronization Output Fields (continued)

Field Name	Field Description	Level of Output
<b>Clock locked to</b>	Indicates whether the clock is locked to either the <b>primary</b> source or the <b>secondary</b> source.	none
<b>Configured sources</b>	Heading for the list of interfaces configured for chassis synchronization and their subsequent status indicators.	none
<b>Source name</b>	Indicates the configured interface that is the source. The <b>external</b> source name indicates the external clock interface.	none
<b>Configured Priority</b>	Indicates the priority configured for the interface.	none
<b>Interface Status</b>	Indicates the status of the interface as <b>primary</b> , <b>secondary</b> , or <b>n/a</b> (external).	none
<b>Configured quality</b>	Indicates the configured quality of the interface. <ul style="list-style-type: none"> <li>• <b>prs</b>—Primary reference source—Stratum 1</li> <li>• <b>st2</b>—Stratum 2</li> <li>• <b>tnc</b>—Transit node clock</li> <li>• <b>st3e</b>—Stratum 3E</li> <li>• <b>st3</b>—Stratum 3</li> <li>• <b>smc</b>—SONET minimum clock</li> <li>• <b>st4</b>—Stratum 4</li> <li>• <b>prc</b>—Primary reference clock</li> <li>• <b>ssu-a</b>—Synchronization supply unit A</li> <li>• <b>ssu-b</b>—Synchronization supply unit B</li> <li>• <b>sec</b>—SDH equipment clock</li> </ul>	none
<b>Interface</b>	Indicates the configured interface: <ul style="list-style-type: none"> <li>• <b>ge-fpc/pic/port</b>—Indicates the interface type and which FPC, PIC, and port are configured.</li> </ul>	<b>extensive</b>
<b>Status</b>	Indicates the synchronization status of the indicated interface, as follows: <ul style="list-style-type: none"> <li>• <b>Primary</b>—This interface is the selected primary chassis clock source.</li> <li>• <b>Secondary</b>—This interface is the selected secondary chassis clock source.</li> <li>• <b>n/a</b>—This interface is not a selected clock source.</li> </ul>	<b>extensive</b>
<b>Index</b>	Unique numeric identifier for the established Synchronous Ethernet configuration.	<b>extensive</b>
<b>Clock source state</b>	Indicates the status of the Synchronous Ethernet clock source: <ul style="list-style-type: none"> <li>• <b>Clk qualified</b>—The Synchronous Ethernet clock source is qualified.</li> <li>• <b>n/a</b>—The Synchronous Ethernet clock source is not qualified.</li> </ul>	<b>extensive</b>

Table 165: show chassis synchronization Output Fields (continued)

Field Name	Field Description	Level of Output
<b>Priority</b>	Indicates the configured priority. The range is from 1 through 5. The following values indicate whether the parameter is not specified or undefined: <ul style="list-style-type: none"> <li>• <b>Default(8)</b>—The parameter is not specified.</li> <li>• <b>-</b>—The parameter is undefined or out of range.</li> </ul>	<b>extensive</b>
<b>Configured QL</b>	Indicates the configured source interface quality level (QL), which is dependent on the source interface and option. The following quality levels are supported and the configured QL is indicated: <ul style="list-style-type: none"> <li>• <b>prs   st2   tnc   st3e   st3   smc   st4</b>—Network option I QLs</li> <li>• <b>prc   ssu-a   ssu-b   sec</b>—Network option II QLs</li> </ul>	<b>extensive</b>
<b>ESMC QL</b>	Indicates the configured Ethernet Synchronization Message Channel (ESMC) quality level: <ul style="list-style-type: none"> <li>• <b>DNU</b>—Network option I source</li> <li>• <b>DSU</b>—Network option II source</li> </ul>	<b>extensive</b>
<b>Clock source type</b>	Indicates that the configured chassis synchronization clock source is one of the following types: <ul style="list-style-type: none"> <li>• <b>ifd</b>—Uses the free-run local oscillator.</li> <li>• <b>extern</b>—Uses a configured qualified clock source.</li> </ul>	<b>extensive</b>
<b>Clock Event</b>	Indicates the event clock status: <ul style="list-style-type: none"> <li>• <b>Clock locked</b>—Clock is established.</li> <li>• <b>n/a</b>—Clock is not established.</li> </ul>	<b>extensive</b>
<b>Configuration flags</b>	Indicates <b>Ext</b> for external interface configuration	
<b>Wait-to-restore time</b>	Indicates the amount of time in minutes for the port signal to be up before the port is opened to receive and transmit Ethernet Synchronization messages.	<b>extensive</b>
<b>Hold-off time</b>	Indicates the amount of time in milliseconds for hold off time for Synchronous Ethernet interfaces and external clock source interfaces to prevent rapid successive switching. If an interface goes down, hold-off time delays short signal failures from being sent to the clock selection process.	<b>extensive</b>
<b>Kernel flags</b>	Indicates the Synchronous Ethernet software operational status: <ul style="list-style-type: none"> <li>• <b>Up</b>—The Synchronous Ethernet software is operational for the configured interface.</li> <li>• <b>pri</b>—The source is the selected primary clock source.</li> <li>• <b>Dn</b>—The Synchronous Ethernet software is not operational for the configured interface.</li> </ul>	<b>extensive</b>

Table 165: show chassis synchronization Output Fields (continued)

Field Name	Field Description	Level of Output
Ineligibility reason	<p>Indicates the reason the interface is ineligible for the Synchronous Ethernet operation, including the following:</p> <ul style="list-style-type: none"> <li>• <b>Link Down</b>—The link between the Synchronous Ethernet interfaces is not operational.</li> <li>• <b>Not restored</b>—The Synchronous Ethernet link has not yet been restored because it is waiting for the specified <b>wait-to-restore</b> time to elapse.</li> <li>• <b>Forbidden slot</b>—Slot 10 is not supported.</li> <li>• <b>Interface unit missing</b>—The unit parameter is not set or is invalid.</li> <li>• <b>Locked</b>—The paired interface is not available.</li> <li>• <b>No cfg</b>—Synchronous Ethernet is not configured.</li> <li>• <b>RX Disabled</b>—The receiving interface is disabled.</li> <li>• <b>Undefined/invalid QL</b>—The QL mode is not specified in the configuration or, if specified, is not supported.</li> </ul> <p><b>NOTE:</b> When GPS is configured as the clock source and the <b>quality-mode-enable</b> statement is configured, the <b>Current Lock Status</b> is displayed as <b>Locked</b> but <b>Undefined/invalid QL</b> is displayed as the Ineligibility reason. As a workaround, configure the <b>no-ssm-support</b> statement at the <b>[edit chassis synchronization source interfaces interface-name]</b> hierarchy level.</p> <ul style="list-style-type: none"> <li>• <b>System initialization in progress</b>—The remote system is performing initialization and not currently available for synchronization.</li> <li>• <b>Unsupported interface</b>—The configured interface does not support Synchronous Ethernet.</li> </ul>	extensive
Clock module on	Indicates whether the clock module is on the Switch Control Board <b>SCB0</b> or <b>SCB1</b> .	clock-module
Current role	<p>Indicates the role of the clock module:</p> <ul style="list-style-type: none"> <li>• <b>master</b>—The clock module is on the primary SCB, which is the active chassis clock source.</li> <li>• <b>backup</b>—The clock module is on the backup SCB, which mirrors the state of the active clock.</li> </ul>	clock-module
Current state	<p>Indicates the state of the clock module:</p> <ul style="list-style-type: none"> <li>• <b>freerun</b>—The clock module is in free-run mode. When the system starts up, the default clock module state is free-run.</li> <li>• <b>acquiring-lock on</b>—The clock module is attempting to acquire a lock on the specified clock source.</li> <li>• <b>locked to</b>—The clock module is locked to the specified clock source.</li> <li>• <b>holdover on</b>—The clock module is in holdover mode on the specified clock source. Prior to the specified clock source becoming invalid, the clock module was locked on the source and holdover data was collected.</li> <li>• <b>holdover</b>—The clock module has transitioned into holdover prior to locking on a valid clock source and collecting holdover data.</li> </ul>	clock-module
Monitored clock sources	Displays information about monitored clock sources.	clock-module



Table 165: show chassis synchronization Output Fields (continued)

Field Name	Field Description	Level of Output
Interface	Indicates the interface type and which FPC, PIC, and port are configured: <ul style="list-style-type: none"> <li><b>external</b>—External clock source</li> <li><b>ge-fpc/pic/port</b>—Line Synchronous Ethernet or PTP slave</li> <li><b>xe-fpc/pic/port</b>—Line Synchronous Ethernet or PTP slave</li> </ul>	clock-module
Type	Indicates the type of clock source: <ul style="list-style-type: none"> <li><b>t1</b>—BITS T1 framed</li> <li><b>e1</b>—BITS E1 framed</li> <li><b>2048khz</b>—BITS unframed 2048 KHz frequency source</li> <li><b>syncE</b>—Synchronous Ethernet frequency source</li> <li><b>ptp</b>—PTP slave source</li> <li><b>ptp-hybrid</b>—PTP slave source using Synchronous Ethernet for frequency</li> </ul>	clock-module
Status	Indicates the status of the clock source: <ul style="list-style-type: none"> <li><b>failed</b>—The clock source is in the failed state.</li> <li><b>qualifying</b>—The clock source is being qualified.</li> <li><b>qualified</b>—The clock source is qualified and can be selected as the chassis clock source.</li> <li><b>qualified-selected</b>—The clock source is qualified and selected as the chassis clock source.</li> </ul>	clock-module

## Sample Output

### show chassis synchronization

```

user@host> show chassis synchronization

Current clock status: Locked
Clock locked to : Primary

Configured sources
Source      Configured   Interface   Configured
Name        Priority     Status      Quality
-----
ge-1/0/0    -           Primary     PRC

```

## Sample Output

### show chassis synchronization extensive

```

user@host> show chassis synchronization extensive

Current clock status: Locked
Clock locked to      : Primary

Configured sources:

```

```

Interface      : ge-1/0/0
Status         : Primary           Index : 143
Clock source state : Clk qualified Priority : -
Configured QL    : PRC             ESMC QL : DNU
Clock source type : ifd             Clock Event : Clock locked
Kernel flags     : Up,pri,
Wait-to-restore time : 1
Hold-off time    : 1200
Interface State  : Up,ESMC TX(QL SEC/SSM 0xb),

```

## Sample Output

### show chassis synchronization extensive (Synchronous Ethernet with link down)

```

user@host> show chassis synchronization extensive

Current clock status : Holdover
Configured sources:

Interface      : ge-1/0/2
Status         : n/a               Index      : 142
Clock source state : n/a           Priority    : Default(8)
Configured QL    : SSU-B           ESMC QL     : DNU
Clock source type : ifd             Clock Event : n/a
Kernel flags     : Dn,
Ineligibility reason: Link Down,
Wait-to-restore time : 1
Hold-off time    : 1200
Interface State  : Up,ESMC TX(QL SEC/SSM 0xb),

```

## Sample Output

### show chassis synchronization extensive (Synchronous Ethernet with physical interface not restored)

```

user@host> show chassis synchronization extensive

Current clock status : Holdover
Configured sources:

Interface      : ge-1/0/2
Status         : n/a               Index      : 142
Clock source state : n/a           Priority    : Default(8)
Configured QL    : SSU-B           ESMC QL     : DNU
Clock source type : ifd             Clock Event : n/a
Kernel flags     : Restoring in 13s,ESMC TX(QL DNU/SSM 0xf),
Ineligibility reason: Not restored,
Wait-to-restore time : 1
Hold-off time    : 1200
Interface State  : Up,ESMC TX(QL SEC/SSM 0xb),

```

## Sample Output

### show chassis synchronization extensive (Synchronous Ethernet configured on ineligible slot 10)

```

user@host> show chassis synchronization extensive

Current clock status : Holdover
Configured sources:

```

```

Interface          : ge-10/0/2 # Note: configuration 10/x/y (slot 10), which
does not support Synchronous Ethernet
Status             : n/a          Index          : 142
Clock source state  : n/a          Priority       : Default(8)
Configured QL      : SSU-B        ESMC QL       : DNU
Clock source type   : ifd          Clock Event    : n/a
Kernel flags       : Up,
Ineligibility reason: Forbidden slot,
Wait-to-restore time : 1
Hold-off time       : 1200
Interface State     : Up,ESMC TX(QL SEC/SSM 0xb),

```

## Sample Output

### show chassis synchronization extensive (on MX104 Router)

```

user@host> show chassis synchronization extensive

Current clock status : Locked
Clock locked to      : Primary

Configured interfaces:

Name          : bits
Signal type    : e1 (g704 hdb3 sa4)
Rx status     : active
Tx status     : active

Configured sources:

Interface      : bits
Status         : Primary      Index      : 2
Clock source state : Clk qualified Priority   : Default(7)
Configured QL    : SEC        ESMC QL      : SEC
Clock source type : extern     Clock Event  : Clock locked
Wait-to-restore  : 5 min      Hold-off    : 1000 ms
Interface State  : Up,pri,ESMC Rx(SSM 0xb)

```

## Sample Output

### show chassis synchronization clock-module (MX10003 Router)

```

user@host> show chassis synchronization extensive

Current clock status : Locked
Clock locked to      : Primary
SNMP trap status     : Disabled

Configured sources:

Interface : et-0/1/3
Status    : Secondary Index : 563
Clock source state : Clk qualified Priority : 1
Configured QL     : PRC ESMC QL : DNU
Clock source type  : ifd Clock Event : Clock qualified
Wait-to-restore    : 0 min Hold-off : 1000 ms
Interface State    : Up,sec,ESMC TX(QL PRC/SSM 0x2),

```

```
Interface : et-0/1/7
Status : n/a Index : 567
Clock source state : n/a Priority : 3
Configured QL : PRC ESMC QL : DNU
Clock source type : ifd Clock Event : n/a
Wait-to-restore : 0 min Hold-off : 1000 ms
Interface State : Up,ESMC TX(QL PRC/SSM 0x2),

Interface : et-0/1/8
Status : Primary Index : 568
Clock source state : Clk qualified Priority : 1
Configured QL : PRC ESMC QL : DNU
Clock source type : ifd Clock Event : Clock locked
Wait-to-restore : 0 min Hold-off : 1000 ms
Interface State : Up,pri,ESMC TX(QL DNU/SSM 0xf),

Interface : et-1/1/1
Status : n/a Index : 555
Clock source state : n/a Priority : 5
Configured QL : PRC ESMC QL : DNU
Clock source type : ifd Clock Event : n/a
Wait-to-restore : 0 min Hold-off : 1000 ms
Interface State : Dn,
Ineligibility reason: Link Down
```

## Sample Output

### show chassis synchronization clock-module (MX204 Router)

```
user@host> show chassis synchronization clock-module
```

```
re0:
```

```
-----
Clock module on SCB0
Current role      : master
```

## Sample Output

### show chassis synchronization interface

```
user@host> show chassis synchronization interface ge-1/0/2
```

```
Current clock status : Locked
Clock locked to      : Primary
```

## Sample Output

### show chassis synchronization clock-module

```
user@host> show chassis synchronization clock-module
```

```
Clock module on SCB0
Current role      : master
Current state     : locked to ge-4/1/0
```

```

State for      : 0 days, 00 hrs, 00 mins, 15 secs
State since    : Mon Jun  6 07:29:40 2011
Monitored clock sources
Interface      Type      Status
ge-4/1/0      syncE      qualified-selected
ge-4/3/0      syncE      qualified

```

### show chassis synchronization (configured external clock interface)

```

user@host> show chassis synchronization

Current clock status : Free-run

Configured interfaces:
Name      Signal type      Rx status      Tx status
external  e1 (g704 ami sa4)      loss of signal squelched

Configured outputs:
Interface  Tx status  Minimum QL  Tx QL
external   squelched  SEC         DNU

Configured sources:
Source      Configured  Interface  Configured
Name        Priority    Status     Quality
external    Default(6) n/a        SSU-A

```

### show chassis synchronization clock-module (configured external clock interface)

```

user@host> show chassis synchronization clock-module

re0:
-----

Clock module on SCB0
Current role      : master
Current state     : freerun
State for        : 2 days, 06 hrs, 16 mins, 57 secs
State since      : Wed Nov 14 08:02:07 2012
Monitored clock sources
Interface      Type      Status
external      e1        failed

```

### show chassis synchronization extensive (configured external clock interface)

```

user@host> show chassis synchronization extensive

Current clock status: Locked
Clock locked to      : Primary

Configured sources:
Interface      : xe-2/0/10
Status         : Primary      Index : 227
Clock source state : Clk qualified Priority : Default (8)
Configured QL    : SEC        ESMC QL : SEC
Clock source type : ifd        Clock Event : Clock locked
Kernel flags     : Up,pri, ESMC Rx(SSM 0xb),ESMC TX(QL DNU/SSM 0xf),

```

**show chassis synchronization clock-module(configured external clock interfaces)**

```

user@host> show chassis synchronization clock-module

re0:
-----

Clock module on SCB0
  Current role      : master
  Current state     : locked to xe-2/0/10
    State for       : 29 days, 10 hrs, 06 mins, 23 secs
    State since     : Wed Jun 7 21:55:23 2014
  Monitored clock sources
    Interface      Type      Status
    xe-2/0/10     syncE     qualified-selected

```

**show chassis synchronization extensive (configured external clock interface)**

```

user@host> show chassis synchronization extensive

Current clock status : Free-run

Configured interfaces:

Name       : external
Signal type : e1 (g704 ami sa4)
Rx status  : loss of signal
Tx status  : squelched
LED color  : red

Configured outputs:

Interface      : external
Tx status      : squelched (holdover data invalid)
Minimum QL     : SEC           Tx QL       : DNU
Holdover mode  : enabled       Wander filter : disabled
Source mode    : chassis       Source Tx DNU : disabled
Holdover data  : invalid
Current state   : holdover
  State for    : 2 days, 06 hrs, 03 mins, 46 secs
  State since  : Wed Nov 14 08:02:09 2012

Configured sources:

Interface      : external
Status         : n/a           Index      : 0
Clock source state : n/a       Priority    : Default(6)
Configured QL    : SSU-A       ESMC QL    : DNU
Clock source type : extern     Clock Event : n/a
Interface State  : Dn,ESMC Rx(SSM 0xf),
Ineligibility reason: Link Down,

```

## show chassis temperature-thresholds

**List of Syntax**    [Syntax on page 2173](#)  
                           [Syntax \(TX Matrix Routers\) on page 2173](#)  
                           [Syntax \(TX Matrix Plus Routers\) on page 2173](#)  
                           [Syntax \(MX Series Routers\) on page 2173](#)  
                           [Syntax \(MX104, MX204, MX2010, MX2020, MX10003, MX10008, and MX2008 Universal Routing Platforms\) on page 2173](#)  
                           [Syntax \(QFX Series\) on page 2173](#)  
                           [Syntax \(PTX Series\) on page 2173](#)  
                           [Syntax \(EX9251, EX9253 Switches\) on page 2173](#)

**Syntax**    show chassis temperature-thresholds

**Syntax (TX Matrix Routers)**    show chassis temperature-thresholds  
   <lcc *number* | scc>

**Syntax (TX Matrix Plus Routers)**    show chassis temperature-thresholds  
   <lcc *number* | sfc *number*>

**Syntax (MX Series Routers)**    show chassis temperature-thresholds  
   <all-members>  
   <local>  
   <member *member-id*>  
   <satellite [slot-id *slot-ID* | device-alias *alias-name*]>

**Syntax (MX104, MX204, MX2010, MX2020, MX10003, MX10008, and MX2008 Universal Routing Platforms)**    show chassis temperature-thresholds

**Syntax (QFX Series)**    show chassis temperature-thresholds  
                                   <interconnect-device *name*>  
                                   <node-device *name*>

**Syntax (PTX Series)**    show chassis temperature-thresholds

**Syntax (EX9251, EX9253 Switches)**    show chassis temperature-thresholds

**Release Information** Command introduced in Junos OS Release 8.0.  
Command introduced in Junos OS Release 9.0 for EX Series switches.  
**sfc** command introduced in Junos OS Release 9.6 for the TX Matrix Plus router.  
Command introduced in Junos OS Release 11.1 for QFX Series.  
Command introduced in Junos OS Release 12.1 for T4000 Core Routers.  
Command introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport Routers.  
Command introduced in Junos OS Release 12.3 for MX2010 and MX2020 Universal Routing Platforms.  
Command introduced in Junos OS Release 13.2 for MX104 Universal Routing Platforms.  
**satellite** option introduced in Junos OS Release 14.2R3.  
Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.  
Command introduced in Junos OS Release 17.2 for PTX10008 Routers.  
Command introduced in Junos OS Release 17.3 for MX10003 Universal Routing Platforms.  
Command introduced in Junos OS Release 17.3 for MX150 Router Appliance.  
Command introduced in Junos OS Release 17.4 for MX204 Universal Routing Platforms.  
Command introduced in Junos OS Release 18.1R1 for EX9251 switches.  
Command introduced in Junos OS Release 18.2 for EX9253 Switches.  
Command introduced in Junos OS Release 18.2R1 for MX10008 Routers.

**Description** Display chassis temperature threshold settings, in degrees Celsius.

**Options** **none**—Display the temperature threshold details.

**all-members**—(MX Series routers only) (Optional) Display the chassis temperature threshold settings of all member routers in the Virtual Chassis configuration.

**interconnect-device *name***—(QFabric systems only) (Optional) Display the chassis temperature threshold settings of the Interconnect device.

**lcc *number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display the temperature threshold details of a specified T640 router (line-card chassis) that is connected to a TX Matrix router. On a TX Matrix Plus router, display the temperature threshold details of a specified router (line-card chassis) that is connected to a TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.



**local**—(MX Series routers only) (Optional) Display the chassis temperature threshold settings of the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Display the chassis temperature threshold settings of the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

**node-device *name***—(QFabric systems only) (Optional) Display the chassis temperature threshold settings of the Node device.

**satellite [*slot-id slot-ID* | *device-alias alias-name*]**—(Junos Fusion only) (Optional) Display the chassis temperature threshold settings for the specified satellite device or devices in a Junos Fusion, or for all satellite devices if no satellite devices are specified.

**scc**—(TX Matrix routers only) (Optional) Display the temperature threshold details of the TX Matrix router (switch-card chassis).

**sfc *number***—(TX Matrix Plus routers only) (Optional) On TX Matrix Plus routers, display the temperature threshold details of the TX Matrix Plus router, which is the switch-fabric chassis. Replace *number* with 0.

**Required Privilege Level** view

**List of Sample Output**

- [show chassis temperature-thresholds on page 2177](#)
- [show chassis temperature-thresholds \(MX150\) on page 2177](#)
- [show chassis temperature-thresholds \(MX104 Router\) on page 2177](#)
- [show chassis temperature-thresholds \(MX240, MX480, MX960 Routers with Application Services Modular Line Card\) on page 2178](#)
- [show chassis temperature-thresholds \(MX480 Router with MPC4E\) on page 2178](#)
- [show chassis temperature-thresholds \(MX2010 Router\) on page 2178](#)
- [show chassis temperature-thresholds \(MX2020 Router\) on page 2181](#)
- [show chassis temperature-thresholds \(MX2020 Router with MPC4E\) on page 2184](#)
- [show chassis temperature-thresholds \(MX2008 Routers\) on page 2186](#)
- [show chassis temperature-thresholds \(MX10003 Router\) on page 2189](#)
- [show chassis temperature-thresholds \(MX10008 Router\) on page 2192](#)
- [show chassis temperature-thresholds \(MX204 Router\) on page 2199](#)
- [show chassis temperature-thresholds \(PTX10008 Routers\) on page 2200](#)
- [show chassis temperature-thresholds \(T4000 Core Routers\) on page 2202](#)
- [show chassis temperature-thresholds \(TX Matrix Plus Router\) on page 2202](#)
- [show chassis temperature-thresholds lcc \(TX Matrix Plus Router\) on page 2204](#)
- [show chassis temperature-thresholds sfc \(TX Matrix Plus Router\) on page 2204](#)
- [show chassis temperature-thresholds \(TX Matrix Plus routers with 3D SIBs\) on page 2205](#)
- [show chassis temperature-thresholds \(QFX3500 Switch and QFX3600\) on page 2206](#)
- [show chassis temperature-thresholds interconnect-device \(QFabric System\) on page 2207](#)
- [show chassis temperature-thresholds \(PTX5000 Packet Transport Router\) on page 2207](#)
- [show chassis temperature-thresholds \(PTX1000 Packet Transport Router\) on page 2208](#)

[show chassis temperature-thresholds \(MX Routers with Media Services Blade \[MSB\]\) on page 2209](#)

[show chassis temperature-thresholds \(EX9251 Switches\) on page 2210](#)

[show chassis temperature-thresholds \(EX9253 switches\) on page 2210](#)

**Output Fields** [Table 166 on page 2176](#) lists the output fields for the **show chassis temperature-thresholds** command. Output fields are listed in the approximate order in which they appear.

*Table 166: show chassis temperature-thresholds Output Fields*

Field name	Field Description
Item	Chassis component. If per FRU per slot thresholds are configured, the components about which information is displayed include the chassis, the Routing Engines, FPCs, and FEBs. If per FRU per slot thresholds are not configured, the components about which information is displayed include the chassis and the Routing Engines.
Fan speed	<p><b>NOTE:</b> On the QFX3500 switch and QFX3600 switch, there are four fan speeds: <b>low</b>, <b>medium-low</b>, <b>medium-high</b>, and <b>high</b>. The fan speed changes at the threshold when going from a low speed to a higher speed. When the fan speed changes from a higher speed to a lower speed, the temperature changes two degrees below the threshold.</p> <p>Temperature threshold settings, in degrees Celsius, for the fans to operate at normal and high speeds.</p> <ul style="list-style-type: none"> <li>Normal—The fans operate at normal speed if the component is at or below this temperature and all the fans are present and functioning normally.</li> </ul> <p><b>NOTE:</b> On a TX Matrix Plus router with 3D SIBs, the threshold temperature at the XF junction is set to 70°C for <b>Normal</b> fan speed, which is less than or equal to 4800 RPM.</p> <ul style="list-style-type: none"> <li>High—The fans operate at high speed if the component has exceeded this temperature or a fan has failed or is missing.</li> </ul> <p><b>NOTE:</b> On a TX Matrix Plus router with 3D SIBs, the threshold temperature at the XF junction is set to 75°C for <b>High</b> fan speed, which is greater than or equal to 5000 RPM.</p> <p><b>NOTE:</b> For MX480 Routers, there are three fan speeds: Low, Medium, and High.</p> <p>An alarm is not triggered until the temperature exceeds the threshold settings for a yellow alarm or a red alarm.</p>
Yellow alarm	<p>Temperature threshold settings, in degrees Celsius, that trigger a yellow alarm.</p> <ul style="list-style-type: none"> <li>Normal—The temperature that must be exceeded on the component to trigger a yellow alarm when the fans are running at full speed.</li> <li>Bad fan—The temperature that must be exceeded on the component to trigger a yellow alarm when one or more fans have failed or are missing.</li> </ul>
Red alarm	<p>Temperature threshold settings, in degrees Celsius, that trigger a red alarm.</p> <ul style="list-style-type: none"> <li>Normal—The temperature that must be exceeded on the component to trigger a red alarm when the fans are running at full speed.</li> <li>Bad fan—The temperature that must be exceeded on the component to trigger a red alarm when one or more fans have failed or are missing.</li> </ul>
Fire Shutdown	(T4000 routers, TX Matrix Plus router with 3D SIBs, and PTX Series Packet Transport Routers only)—Temperature threshold settings, in degrees Celsius, for the network device to shut down.

## Sample Output

### show chassis temperature-thresholds

```
user@host> show chassis temperature-thresholds
```

Item	Fan speed (degrees C)		Yellow alarm (degrees C)		Red alarm (degrees C)	
	Normal	High	Normal	Bad fan	Normal	Bad fan
Chassis default	48	54	65	55	75	65
Routing Engine 0	70	80	95	95	110	110
Routing Engine 1	70	80	95	95	110	110
FPC 0	55	60	75	65	90	80
FPC 1	55	60	75	65	90	80
FPC 2	55	60	75	65	90	80
FPC 3	55	60	75	65	90	80
FPC 4	55	60	75	65	90	80
FPC 5	55	60	75	65	90	80
FPC 6	55	60	75	65	90	80
FPC 7	55	60	75	65	90	80
FPC 8	55	60	75	65	90	80
FPC 9	55	60	75	65	90	80
FPC 10	55	60	75	65	90	80
FPC 11	55	60	75	65	90	80

### show chassis temperature-thresholds (MX150)

```
user@host> show chassis temperature-thresholds
```

Item	Fan speed (degrees C)		Yellow alarm (degrees C)		Red alarm (degrees C)		Fire Shutdown (degrees C)	
	Normal	High	Normal	High	Normal	Bad fan	Normal	Bad fan
FPC 0 Sensor 1	43	65	68	68	70	70		
FPC 0 Sensor 2	43	65	68	68	70	70		
FPC 0 Coretemp	78	94	100	100	105	105		

### show chassis temperature-thresholds (MX104 Router)

```
user@host> show chassis temperature-thresholds
```

Item	Fan speed (degrees C)		Yellow alarm (degrees C)		Red alarm (degrees C)		Fire Shutdown (degrees C)	
	Normal	High	Normal	High	Normal	Bad fan	Normal	Bad fan
Chassis default	48	54	65	55	75	65		
Routing Engine 0	55	80	95	95	105	100		

### show chassis temperature-thresholds (MX240, MX480, MX960 Routers with Application Services Modular Line Card)

```
user@host> show chassis temperature-thresholds
```

Fan speed (degrees C)	Yellow alarm (degrees C)		Red alarm (degrees C)		Fire Shutdown (degrees C)	
	Normal	High	Normal	Bad fan	Normal	Bad fan
Item						
Normal						
Chassis default	48	54	65	55	75	65
100						
Routing Engine 0	70	80	95	95	110	110
112						
Routing Engine 1	70	80	95	95	110	110
112						
FPC 0	55	60	75	65	90	80
95						
FPC 1	55	60	75	65	90	80
95						
FPC 2	55	60	75	65	90	80
95						
FPC 4	55	60	75	65	90	80
95						
FPC 5	55	60	75	65	90	80
95						

### show chassis temperature-thresholds (MX480 Router with MPC4E)

```
user@ host> show chassis temperature-thresholds
```

Fan speed (degrees C)	Yellow alarm (degrees C)		Red alarm (degrees C)		Fire Shutdown (degrees C)	
	Normal	High	Normal	Bad fan	Normal	Bad fan
Item						
Normal						
Chassis default	48	54	65	55	75	65
100						
Routing Engine 0	70	80	95	95	110	110
112						
Routing Engine 1	70	80	95	95	110	110
112						
FPC 2	55	60	75	65	95	80
100						
FPC 3	55	60	75	65	95	80
100						
FPC 4	55	60	75	65	90	80
95						

### show chassis temperature-thresholds (MX2010 Router)

```
user@host> show chassis temperature-thresholds
```

Item	Fan speed (degrees C)		Yellow alarm (degrees C)		Red alarm (degrees C)		Fire Shutdown (degrees C)	
	Normal	High	Normal	Bad fan	Normal	Bad fan	Normal	Bad fan
Routing Engine 0	70	80	95	95	110	110	112	112
Routing Engine 1	70	80	95	95	110	110	112	112
CB 0 IntakeA-Zone0	60	65	78	75	85	80	95	95
CB 0 IntakeB-Zone1	60	65	78	75	85	80	95	95

CB 0 IntakeC-Zone0	60	65	78	75	85	80	95
CB 0 ExhaustA-Zone0	60	65	78	75	85	80	95
CB 0 ExhaustB-Zone1	60	65	78	75	85	80	95
CB 0 TCBC-Zone0	60	65	78	75	85	80	95
CB 1 IntakeA-Zone0	60	65	78	75	85	80	95
CB 1 IntakeB-Zone1	60	65	78	75	85	80	95
CB 1 IntakeC-Zone0	60	65	78	75	85	80	95
CB 1 ExhaustA-Zone0	60	65	78	75	85	80	95
CB 1 ExhaustB-Zone1	60	65	78	75	85	80	95
CB 1 TCBC-Zone0	60	65	78	75	85	80	95
SPMB 0 Intake	56	62	75	63	83	76	95
SPMB 1 Intake	56	62	75	63	83	76	95
SFB 0 Intake-Zone0	56	62	75	63	82	70	87
SFB 0 Exhaust-Zone1	56	62	75	63	82	70	87
SFB 0 IntakeA-Zone0	56	62	75	63	82	70	87
SFB 0 IntakeB-Zone1	56	62	75	63	82	70	87
SFB 0 Exhaust-Zone0	56	62	75	63	82	70	87
SFB 0 SFB-XF2-Zone1	70	80	90	90	107	107	115
SFB 0 SFB-XF1-Zone0	70	80	90	90	107	107	115
SFB 0 SFB-XF0-Zone0	70	80	90	90	107	107	115
SFB 1 Intake-Zone0	56	62	75	63	82	70	87
SFB 1 Exhaust-Zone1	56	62	75	63	82	70	87
SFB 1 IntakeA-Zone0	56	62	75	63	82	70	87
SFB 1 IntakeB-Zone1	56	62	75	63	82	70	87
SFB 1 Exhaust-Zone0	56	62	75	63	82	70	87
SFB 1 SFB-XF2-Zone1	70	80	90	90	107	107	115
SFB 1 SFB-XF1-Zone0	70	80	90	90	107	107	115
SFB 1 SFB-XF0-Zone0	70	80	90	90	107	107	115
SFB 2 Intake-Zone0	56	62	75	63	82	70	87
SFB 2 Exhaust-Zone1	56	62	75	63	82	70	87
SFB 2 IntakeA-Zone0	56	62	75	63	82	70	87
SFB 2 IntakeB-Zone1	56	62	75	63	82	70	87
SFB 2 Exhaust-Zone0	56	62	75	63	82	70	87
SFB 2 SFB-XF2-Zone1	70	80	90	90	107	107	115
SFB 2 SFB-XF1-Zone0	70	80	90	90	107	107	115
SFB 2 SFB-XF0-Zone0	70	80	90	90	107	107	115
SFB 3 Intake-Zone0	56	62	75	63	82	70	87
SFB 3 Exhaust-Zone1	56	62	75	63	82	70	87
SFB 3 IntakeA-Zone0	56	62	75	63	82	70	87
SFB 3 IntakeB-Zone1	56	62	75	63	82	70	87
SFB 3 Exhaust-Zone0	56	62	75	63	82	70	87
SFB 3 SFB-XF2-Zone1	70	80	90	90	107	107	115
SFB 3 SFB-XF1-Zone0	70	80	90	90	107	107	115
SFB 3 SFB-XF0-Zone0	70	80	90	90	107	107	115
SFB 4 Intake-Zone0	56	62	75	63	82	70	87
SFB 4 Exhaust-Zone1	56	62	75	63	82	70	87
SFB 4 IntakeA-Zone0	56	62	75	63	82	70	87
SFB 4 IntakeB-Zone1	56	62	75	63	82	70	87
SFB 4 Exhaust-Zone0	56	62	75	63	82	70	87
SFB 4 SFB-XF2-Zone1	70	80	90	90	107	107	115
SFB 4 SFB-XF1-Zone0	70	80	90	90	107	107	115
SFB 4 SFB-XF0-Zone0	70	80	90	90	107	107	115
SFB 5 Intake-Zone0	56	62	75	63	82	70	87
SFB 5 Exhaust-Zone1	56	62	75	63	82	70	87
SFB 5 IntakeA-Zone0	56	62	75	63	82	70	87
SFB 5 IntakeB-Zone1	56	62	75	63	82	70	87
SFB 5 Exhaust-Zone0	56	62	75	63	82	70	87
SFB 5 SFB-XF2-Zone1	70	80	90	90	107	107	115
SFB 5 SFB-XF1-Zone0	70	80	90	90	107	107	115
SFB 5 SFB-XF0-Zone0	70	80	90	90	107	107	115

SFB 6 Intake-Zone0	56	62	75	63	82	70	87
SFB 6 Exhaust-Zone1	56	62	75	63	82	70	87
SFB 6 IntakeA-Zone0	56	62	75	63	82	70	87
SFB 6 IntakeB-Zone1	56	62	75	63	82	70	87
SFB 6 Exhaust-Zone0	56	62	75	63	82	70	87
SFB 6 SFB-XF2-Zone1	70	80	90	90	107	107	115
SFB 6 SFB-XF1-Zone0	70	80	90	90	107	107	115
SFB 6 SFB-XF0-Zone0	70	80	90	90	107	107	115
SFB 7 Intake-Zone0	56	62	75	63	82	70	87
SFB 7 Exhaust-Zone1	56	62	75	63	82	70	87
SFB 7 IntakeA-Zone0	56	62	75	63	82	70	87
SFB 7 IntakeB-Zone1	56	62	75	63	82	70	87
SFB 7 Exhaust-Zone0	56	62	75	63	82	70	87
SFB 7 SFB-XF2-Zone1	70	80	90	90	107	107	115
SFB 7 SFB-XF1-Zone0	70	80	90	90	107	107	115
SFB 7 SFB-XF0-Zone0	70	80	90	90	107	107	115
FPC 0	55	60	75	65	95	80	100
FPC 1	55	60	75	65	90	80	95
FPC 2	55	60	75	65	95	80	100
FPC 3	55	60	75	65	90	80	95
FPC 4	55	60	75	65	90	80	95
FPC 5	55	60	75	65	95	80	100
FPC 6	55	60	75	65	90	80	95
FPC 7	55	60	75	65	95	80	100
FPC 8	55	60	75	65	90	80	95
FPC 9	55	60	75	65	95	80	100
ADC 0 Intake	56	62	75	63	83	76	95
ADC 0 Exhaust	56	62	75	63	83	76	95
ADC 0 ADC-XF1	70	80	90	90	107	107	115
ADC 0 ADC-XF0	70	80	90	90	107	107	115
ADC 1 Intake	56	62	75	63	83	76	95
ADC 1 Exhaust	56	62	75	63	83	76	95
ADC 1 ADC-XF1	70	80	90	90	107	107	115
ADC 1 ADC-XF0	70	80	90	90	107	107	115
ADC 2 Intake	56	62	75	63	83	76	95
ADC 2 Exhaust	56	62	75	63	83	76	95
ADC 2 ADC-XF1	70	80	90	90	107	107	115
ADC 2 ADC-XF0	70	80	90	90	107	107	115
ADC 3 Intake	56	62	75	63	83	76	95
ADC 3 Exhaust	56	62	75	63	83	76	95
ADC 3 ADC-XF1	70	80	90	90	107	107	115
ADC 3 ADC-XF0	70	80	90	90	107	107	115
ADC 4 Intake	56	62	75	63	83	76	95
ADC 4 Exhaust	56	62	75	63	83	76	95
ADC 4 ADC-XF1	70	80	90	90	107	107	115
ADC 4 ADC-XF0	70	80	90	90	107	107	115
ADC 5 Intake	56	62	75	63	83	76	95
ADC 5 Exhaust	56	62	75	63	83	76	95
ADC 5 ADC-XF1	70	80	90	90	107	107	115
ADC 5 ADC-XF0	70	80	90	90	107	107	115
ADC 6 Intake	56	62	75	63	83	76	95
ADC 6 Exhaust	56	62	75	63	83	76	95
ADC 6 ADC-XF1	70	80	90	90	107	107	115
ADC 6 ADC-XF0	70	80	90	90	107	107	115
ADC 7 Intake	56	62	75	63	83	76	95
ADC 7 Exhaust	56	62	75	63	83	76	95
ADC 7 ADC-XF1	70	80	90	90	107	107	115
ADC 7 ADC-XF0	70	80	90	90	107	107	115
ADC 8 Intake	56	62	75	63	83	76	95
ADC 8 Exhaust	56	62	75	63	83	76	95

ADC 8 ADC-XF1	70	80	90	90	107	107	115
ADC 8 ADC-XF0	70	80	90	90	107	107	115
ADC 9 Intake	56	62	75	63	83	76	95
ADC 9 Exhaust	56	62	75	63	83	76	95
ADC 9 ADC-XF1	70	80	90	90	107	107	115
ADC 9 ADC-XF0	70	80	90	90	107	107	115

### show chassis temperature-thresholds (MX2020 Router)

```
user@host> show chassis temperature-thresholds
```

Item	Fan speed		Yellow alarm		Red alarm		Fire Shutdown
	(degrees C) Normal	(degrees C) High	(degrees C) Normal	(degrees C) Bad fan	(degrees C) Normal	(degrees C) Bad fan	(degrees C) Normal
Routing Engine 0	70	80	95	95	110	110	112
Routing Engine 1	70	80	95	95	110	110	112
CB 0 IntakeA-Zone0	60	65	78	75	85	80	95
CB 0 IntakeB-Zone1	60	65	78	75	85	80	95
CB 0 IntakeC-Zone0	60	65	78	75	85	80	95
CB 0 ExhaustA-Zone0	60	65	78	75	85	80	95
CB 0 ExhaustB-Zone1	60	65	78	75	85	80	95
CB 0 TCBC-Zone0	60	65	78	75	85	80	95
CB 1 IntakeA-Zone0	60	65	78	75	85	80	95
CB 1 IntakeB-Zone1	60	65	78	75	85	80	95
CB 1 IntakeC-Zone0	60	65	78	75	85	80	95
CB 1 ExhaustA-Zone0	60	65	78	75	85	80	95
CB 1 ExhaustB-Zone1	60	65	78	75	85	80	95
CB 1 TCBC-Zone0	60	65	78	75	85	80	95
SPMB 0 Intake	56	62	75	63	83	76	95
SPMB 1 Intake	56	62	75	63	83	76	95
SFB 0 Intake-Zone0	56	62	75	63	82	70	87
SFB 0 Exhaust-Zone1	56	62	75	63	82	70	87
SFB 0 IntakeA-Zone0	56	62	75	63	82	70	87
SFB 0 IntakeB-Zone1	56	62	75	63	82	70	87
SFB 0 Exhaust-Zone0	56	62	75	63	82	70	87
SFB 0 SFB-XF2-Zone1	70	80	90	90	107	107	115
SFB 0 SFB-XF1-Zone0	70	80	90	90	107	107	115
SFB 0 SFB-XF0-Zone0	70	80	90	90	107	107	115
SFB 1 Intake-Zone0	56	62	75	63	82	70	87
SFB 1 Exhaust-Zone1	56	62	75	63	82	70	87
SFB 1 IntakeA-Zone0	56	62	75	63	82	70	87
SFB 1 IntakeB-Zone1	56	62	75	63	82	70	87
SFB 1 Exhaust-Zone0	56	62	75	63	82	70	87
SFB 1 SFB-XF2-Zone1	70	80	90	90	107	107	115
SFB 1 SFB-XF1-Zone0	70	80	90	90	107	107	115
SFB 1 SFB-XF0-Zone0	70	80	90	90	107	107	115
SFB 2 Intake-Zone0	56	62	75	63	82	70	87
SFB 2 Exhaust-Zone1	56	62	75	63	82	70	87
SFB 2 IntakeA-Zone0	56	62	75	63	82	70	87
SFB 2 IntakeB-Zone1	56	62	75	63	82	70	87
SFB 2 Exhaust-Zone0	56	62	75	63	82	70	87
SFB 2 SFB-XF2-Zone1	70	80	90	90	107	107	115
SFB 2 SFB-XF1-Zone0	70	80	90	90	107	107	115
SFB 2 SFB-XF0-Zone0	70	80	90	90	107	107	115
SFB 3 Intake-Zone0	56	62	75	63	82	70	87
SFB 3 Exhaust-Zone1	56	62	75	63	82	70	87
SFB 3 IntakeA-Zone0	56	62	75	63	82	70	87
SFB 3 IntakeB-Zone1	56	62	75	63	82	70	87
SFB 3 Exhaust-Zone0	56	62	75	63	82	70	87

SFB 3 SFB-XF2-Zone1	70	80	90	90	107	107	115
SFB 3 SFB-XF1-Zone0	70	80	90	90	107	107	115
SFB 3 SFB-XF0-Zone0	70	80	90	90	107	107	115
SFB 4 Intake-Zone0	56	62	75	63	82	70	87
SFB 4 Exhaust-Zone1	56	62	75	63	82	70	87
SFB 4 IntakeA-Zone0	56	62	75	63	82	70	87
SFB 4 IntakeB-Zone1	56	62	75	63	82	70	87
SFB 4 Exhaust-Zone0	56	62	75	63	82	70	87
SFB 4 SFB-XF2-Zone1	70	80	90	90	107	107	115
SFB 4 SFB-XF1-Zone0	70	80	90	90	107	107	115
SFB 4 SFB-XF0-Zone0	70	80	90	90	107	107	115
SFB 5 Intake-Zone0	56	62	75	63	82	70	87
SFB 5 Exhaust-Zone1	56	62	75	63	82	70	87
SFB 5 IntakeA-Zone0	56	62	75	63	82	70	87
SFB 5 IntakeB-Zone1	56	62	75	63	82	70	87
SFB 5 Exhaust-Zone0	56	62	75	63	82	70	87
SFB 5 SFB-XF2-Zone1	70	80	90	90	107	107	115
SFB 5 SFB-XF1-Zone0	70	80	90	90	107	107	115
SFB 5 SFB-XF0-Zone0	70	80	90	90	107	107	115
SFB 6 Intake-Zone0	56	62	75	63	82	70	87
SFB 6 Exhaust-Zone1	56	62	75	63	82	70	87
SFB 6 IntakeA-Zone0	56	62	75	63	82	70	87
SFB 6 IntakeB-Zone1	56	62	75	63	82	70	87
SFB 6 Exhaust-Zone0	56	62	75	63	82	70	87
SFB 6 SFB-XF2-Zone1	70	80	90	90	107	107	115
SFB 6 SFB-XF1-Zone0	70	80	90	90	107	107	115
SFB 6 SFB-XF0-Zone0	70	80	90	90	107	107	115
SFB 7 Intake-Zone0	56	62	75	63	82	70	87
SFB 7 Exhaust-Zone1	56	62	75	63	82	70	87
SFB 7 IntakeA-Zone0	56	62	75	63	82	70	87
SFB 7 IntakeB-Zone1	56	62	75	63	82	70	87
SFB 7 Exhaust-Zone0	56	62	75	63	82	70	87
SFB 7 SFB-XF2-Zone1	70	80	90	90	107	107	115
SFB 7 SFB-XF1-Zone0	70	80	90	90	107	107	115
SFB 7 SFB-XF0-Zone0	70	80	90	90	107	107	115
FPC 0	55	60	75	65	90	80	95
FPC 1	55	60	75	65	90	80	95
FPC 2	55	60	75	65	90	80	95
FPC 3	55	60	75	65	90	80	95
FPC 4	55	60	75	65	90	80	95
FPC 5	55	60	75	65	90	80	95
FPC 6	55	60	75	65	90	80	95
FPC 7	55	60	75	65	90	80	95
FPC 8	55	60	75	65	90	80	95
FPC 9	55	60	75	65	90	80	95
FPC 10	55	60	75	65	90	80	95
FPC 11	55	60	75	65	90	80	95
FPC 12	55	60	75	65	90	80	95
FPC 13	55	60	75	65	90	80	95
FPC 14	55	60	75	65	90	80	95
FPC 15	55	60	75	65	90	80	95
FPC 16	55	60	75	65	90	80	95
FPC 17	55	60	75	65	90	80	95
FPC 18	55	60	75	65	90	80	95
FPC 19	55	60	75	65	90	80	95
ADC 0 Intake	56	62	75	63	83	76	95
ADC 0 Exhaust	56	62	75	63	83	76	95
ADC 0 ADC-XF1	70	80	90	90	107	107	115
ADC 0 ADC-XF0	70	80	90	90	107	107	115
ADC 1 Intake	56	62	75	63	83	76	95



ADC 1 Exhaust	56	62	75	63	83	76	95
ADC 1 ADC-XF1	70	80	90	90	107	107	115
ADC 1 ADC-XF0	70	80	90	90	107	107	115
ADC 2 Intake	56	62	75	63	83	76	95
ADC 2 Exhaust	56	62	75	63	83	76	95
ADC 2 ADC-XF1	70	80	90	90	107	107	115
ADC 2 ADC-XF0	70	80	90	90	107	107	115
ADC 3 Intake	56	62	75	63	83	76	95
ADC 3 Exhaust	56	62	75	63	83	76	95
ADC 3 ADC-XF1	70	80	90	90	107	107	115
ADC 3 ADC-XF0	70	80	90	90	107	107	115
ADC 4 Intake	56	62	75	63	83	76	95
ADC 4 Exhaust	56	62	75	63	83	76	95
ADC 4 ADC-XF1	70	80	90	90	107	107	115
ADC 4 ADC-XF0	70	80	90	90	107	107	115
ADC 5 Intake	56	62	75	63	83	76	95
ADC 5 Exhaust	56	62	75	63	83	76	95
ADC 5 ADC-XF1	70	80	90	90	107	107	115
ADC 5 ADC-XF0	70	80	90	90	107	107	115
ADC 6 Intake	56	62	75	63	83	76	95
ADC 6 Exhaust	56	62	75	63	83	76	95
ADC 6 ADC-XF1	70	80	90	90	107	107	115
ADC 6 ADC-XF0	70	80	90	90	107	107	115
ADC 7 Intake	56	62	75	63	83	76	95
ADC 7 Exhaust	56	62	75	63	83	76	95
ADC 7 ADC-XF1	70	80	90	90	107	107	115
ADC 7 ADC-XF0	70	80	90	90	107	107	115
ADC 8 Intake	56	62	75	63	83	76	95
ADC 8 Exhaust	56	62	75	63	83	76	95
ADC 8 ADC-XF1	70	80	90	90	107	107	115
ADC 8 ADC-XF0	70	80	90	90	107	107	115
ADC 9 Intake	56	62	75	63	83	76	95
ADC 9 Exhaust	56	62	75	63	83	76	95
ADC 9 ADC-XF1	70	80	90	90	107	107	115
ADC 9 ADC-XF0	70	80	90	90	107	107	115
ADC 10 Intake	56	62	75	63	83	76	95
ADC 10 Exhaust	56	62	75	63	83	76	95
ADC 10 ADC-XF1	70	80	90	90	107	107	115
ADC 10 ADC-XF0	70	80	90	90	107	107	115
ADC 11 Intake	56	62	75	63	83	76	95
ADC 11 Exhaust	56	62	75	63	83	76	95
ADC 11 ADC-XF1	70	80	90	90	107	107	115
ADC 11 ADC-XF0	70	80	90	90	107	107	115
ADC 12 Intake	56	62	75	63	83	76	95
ADC 12 Exhaust	56	62	75	63	83	76	95
ADC 12 ADC-XF1	70	80	90	90	107	107	115
ADC 12 ADC-XF0	70	80	90	90	107	107	115
ADC 13 Intake	56	62	75	63	83	76	95
ADC 13 Exhaust	56	62	75	63	83	76	95
ADC 13 ADC-XF1	70	80	90	90	107	107	115
ADC 13 ADC-XF0	70	80	90	90	107	107	115
ADC 14 Intake	56	62	75	63	83	76	95
ADC 14 Exhaust	56	62	75	63	83	76	95
ADC 14 ADC-XF1	70	80	90	90	107	107	115
ADC 14 ADC-XF0	70	80	90	90	107	107	115
ADC 15 Intake	56	62	75	63	83	76	95
ADC 15 Exhaust	56	62	75	63	83	76	95
ADC 15 ADC-XF1	70	80	90	90	107	107	115
ADC 15 ADC-XF0	70	80	90	90	107	107	115
ADC 16 Intake	56	62	75	63	83	76	95

ADC 16 Exhaust	56	62	75	63	83	76	95
ADC 16 ADC-XF1	70	80	90	90	107	107	115
ADC 16 ADC-XF0	70	80	90	90	107	107	115
ADC 17 Intake	56	62	75	63	83	76	95
ADC 17 Exhaust	56	62	75	63	83	76	95
ADC 17 ADC-XF1	70	80	90	90	107	107	115
ADC 17 ADC-XF0	70	80	90	90	107	107	115
ADC 18 Intake	56	62	75	63	83	76	95
ADC 18 Exhaust	56	62	75	63	83	76	95
ADC 18 ADC-XF1	70	80	90	90	107	107	115
ADC 18 ADC-XF0	70	80	90	90	107	107	115
ADC 19 Intake	56	62	75	63	83	76	95
ADC 19 Exhaust	56	62	75	63	83	76	95
ADC 19 ADC-XF1	70	80	90	90	107	107	115
ADC 19 ADC-XF0	70	80	90	90	107	107	115

### show chassis temperature-thresholds (MX2020 Router with MPC4E)

```
user@host> show chassis temperature-thresholds
```

Fan speed	Yellow alarm (degrees C)		Red alarm (degrees C)		Fire Shutdown (degrees C)		(degrees
C)							
Item	Normal	High	Normal	Bad fan	Normal	Bad fan	Normal
Routing Engine 0	70	80	95	95	110	110	112
Routing Engine 1	70	80	95	95	110	110	112
CB 0 IntakeA-Zone0	60	65	78	75	85	80	95
CB 0 IntakeB-Zone1	60	65	78	75	85	80	95
CB 0 IntakeC-Zone0	60	65	78	75	85	80	95
CB 0 ExhaustA-Zone0	60	65	78	75	85	80	95
CB 0 ExhaustB-Zone1	60	65	78	75	85	80	95
CB 0 TCBC-Zone0	60	65	78	75	85	80	95
CB 1 IntakeA-Zone0	60	65	78	75	85	80	95
CB 1 IntakeB-Zone1	60	65	78	75	85	80	95
CB 1 IntakeC-Zone0	60	65	78	75	85	80	95
CB 1 ExhaustA-Zone0	60	65	78	75	85	80	95
CB 1 ExhaustB-Zone1	60	65	78	75	85	80	95
CB 1 TCBC-Zone0	60	65	78	75	85	80	95
SPMB 0 Intake	56	62	75	63	83	76	95
SPMB 1 Intake	56	62	75	63	83	76	95
SFB 0 Intake-Zone0	56	62	70	70	85	85	89
SFB 0 Exhaust-Zone1	56	62	70	70	85	85	89
SFB 0 IntakeA-Zone0	56	62	70	70	85	85	89
SFB 0 IntakeB-Zone1	56	62	70	70	85	85	89
SFB 0 Exhaust-Zone0	56	62	70	70	85	85	89
SFB 0 SFB-XF2-Zone1	70	75	90	85	95	90	100
SFB 0 SFB-XF1-Zone0	70	75	90	85	95	90	100
SFB 0 SFB-XF0-Zone0	70	75	90	85	95	90	100
SFB 1 Intake-Zone0	56	62	70	70	85	85	89
SFB 1 Exhaust-Zone1	56	62	70	70	85	85	89
SFB 1 IntakeA-Zone0	56	62	70	70	85	85	89
SFB 1 IntakeB-Zone1	56	62	70	70	85	85	89
SFB 1 Exhaust-Zone0	56	62	70	70	85	85	89
SFB 1 SFB-XF2-Zone1	70	75	90	85	95	90	100
SFB 1 SFB-XF1-Zone0	70	75	90	85	95	90	100
SFB 1 SFB-XF0-Zone0	70	75	90	85	95	90	100
SFB 2 Intake-Zone0	56	62	70	70	85	85	89
SFB 2 Exhaust-Zone1	56	62	70	70	85	85	89
SFB 2 IntakeA-Zone0	56	62	70	70	85	85	89
SFB 2 IntakeB-Zone1	56	62	70	70	85	85	89

SFB 2 Exhaust-Zone0	56	62	70	70	85	85	89
SFB 2 SFB-XF2-Zone1	70	75	90	85	95	90	100
SFB 2 SFB-XF1-Zone0	70	75	90	85	95	90	100
SFB 2 SFB-XF0-Zone0	70	75	90	85	95	90	100
SFB 3 Intake-Zone0	56	62	70	70	85	85	89
SFB 3 Exhaust-Zone1	56	62	70	70	85	85	89
SFB 3 IntakeA-Zone0	56	62	70	70	85	85	89
SFB 3 IntakeB-Zone1	56	62	70	70	85	85	89
SFB 3 Exhaust-Zone0	56	62	70	70	85	85	89
SFB 3 SFB-XF2-Zone1	70	75	90	85	95	90	100
SFB 3 SFB-XF1-Zone0	70	75	90	85	95	90	100
SFB 3 SFB-XF0-Zone0	70	75	90	85	95	90	100
SFB 4 Intake-Zone0	56	62	70	70	85	85	89
SFB 4 Exhaust-Zone1	56	62	70	70	85	85	89
SFB 4 IntakeA-Zone0	56	62	70	70	85	85	89
SFB 4 IntakeB-Zone1	56	62	70	70	85	85	89
SFB 4 Exhaust-Zone0	56	62	70	70	85	85	89
SFB 4 SFB-XF2-Zone1	70	75	90	85	95	90	100
SFB 4 SFB-XF1-Zone0	70	75	90	85	95	90	100
SFB 4 SFB-XF0-Zone0	70	75	90	85	95	90	100
SFB 5 Intake-Zone0	56	62	70	70	85	85	89
SFB 5 Exhaust-Zone1	56	62	70	70	85	85	89
SFB 5 IntakeA-Zone0	56	62	70	70	85	85	89
SFB 5 IntakeB-Zone1	56	62	70	70	85	85	89
SFB 5 Exhaust-Zone0	56	62	70	70	85	85	89
SFB 5 SFB-XF2-Zone1	70	75	90	85	95	90	100
SFB 5 SFB-XF1-Zone0	70	75	90	85	95	90	100
SFB 5 SFB-XF0-Zone0	70	75	90	85	95	90	100
SFB 6 Intake-Zone0	56	62	70	70	85	85	89
SFB 6 Exhaust-Zone1	56	62	70	70	85	85	89
SFB 6 IntakeA-Zone0	56	62	70	70	85	85	89
SFB 6 IntakeB-Zone1	56	62	70	70	85	85	89
SFB 6 Exhaust-Zone0	56	62	70	70	85	85	89
SFB 6 SFB-XF2-Zone1	70	75	90	85	95	90	100
SFB 6 SFB-XF1-Zone0	70	75	90	85	95	90	100
SFB 6 SFB-XF0-Zone0	70	75	90	85	95	90	100
SFB 7 Intake-Zone0	56	62	70	70	85	85	89
SFB 7 Exhaust-Zone1	56	62	70	70	85	85	89
SFB 7 IntakeA-Zone0	56	62	70	70	85	85	89
SFB 7 IntakeB-Zone1	56	62	70	70	85	85	89
SFB 7 Exhaust-Zone0	56	62	70	70	85	85	89
SFB 7 SFB-XF2-Zone1	70	75	90	85	95	90	100
SFB 7 SFB-XF1-Zone0	70	75	90	85	95	90	100
SFB 7 SFB-XF0-Zone0	70	75	90	85	95	90	100
FPC 0	55	60	75	65	90	80	95
FPC 9	55	60	75	65	90	80	95
FPC 10	55	60	75	65	90	80	95
FPC 14	55	60	75	65	95	80	100
FPC 19	55	60	75	65	90	80	95
ADC 0 Intake	50	55	60	60	65	65	80
ADC 0 Exhaust	50	55	60	60	65	65	80
ADC 0 ADC-XF1	70	75	90	85	95	90	100
ADC 0 ADC-XF0	70	75	90	85	95	90	100
ADC 9 Intake	50	55	60	60	65	65	80
ADC 9 Exhaust	50	55	60	60	65	65	80
ADC 9 ADC-XF1	70	75	90	85	95	90	100
ADC 9 ADC-XF0	70	75	90	85	95	90	100
ADC 10 Intake	50	55	60	60	65	65	80
ADC 10 Exhaust	50	55	60	60	65	65	80
ADC 10 ADC-XF1	70	75	90	85	95	90	100

ADC 10 ADC-XF0	70	75	90	85	95	90	100
ADC 14 Intake	50	55	60	60	65	65	80
ADC 14 Exhaust	50	55	60	60	65	65	80
ADC 14 ADC-XF1	70	75	90	85	95	90	100
ADC 14 ADC-XF0	70	75	90	85	95	90	100
ADC 19 Intake	50	55	60	60	65	65	80
ADC 19 Exhaust	50	55	60	60	65	65	80
ADC 19 ADC-XF1	70	75	90	85	95	90	100
ADC 19 ADC-XF0	70	75	90	85	95	90	100

### show chassis temperature-thresholds (MX2008 Routers)

```
user@host> show chassis temperature-thresholds
```

Shutdown (degrees C) Item	Fan speed (degrees C)		Yellow alarm (degrees C)		Red alarm (degrees C)		Fire
	Normal	High	Normal	Bad fan	Normal	Bad fan	
Normal							
Routing Engine 0 CPU	58	63	78	75	93	90	
98							
Routing Engine 1 CPU	58	63	78	75	93	90	
98							
CB 0 Inlet1	55	60	65	62	75	72	
85							
CB 0 Inlet2	45	50	61	58	80	77	
90							
CB 0 Inlet3	57	62	68	65	80	77	
90							
CB 0 Inlet4	55	60	80	77	90	87	
95							
CB 0 Exhaust1	55	60	65	62	75	72	
85							
CB 0 Exhaust2	50	55	60	57	80	77	
90							
CB 0 Exhaust3	70	75	81	78	91	88	
96							
CB 0 Exhaust4	75	80	90	87	100	97	
105							
CB 1 Inlet1	55	60	65	62	75	72	
85							
CB 1 Inlet2	45	50	61	58	80	77	
90							
CB 1 Inlet3	57	62	68	65	80	77	
90							
CB 1 Inlet4	55	60	80	77	90	87	
95							
CB 1 Exhaust1	55	60	65	62	75	72	
85							
CB 1 Exhaust2	50	55	60	57	80	77	
90							
CB 1 Exhaust3	70	75	81	78	91	88	
96							
CB 1 Exhaust4	75	80	90	87	100	97	
105							
SFB 0 Inlet1	49	54	62	59	76	73	
81							
SFB 0 Inlet2	65	70	71	68	83	80	
88							

SFB 0 Exhaust1 80	45	50	61	58	75	72
SFB 0 Exhaust2 85	60	65	69	66	80	77
SFB 0 SFB2-PF-local 100	65	70	75	72	95	92
SFB 0 SFB2-PF-die 120	88	93	98	95	118	115
SFB 1 Inlet1 81	49	54	62	59	76	73
SFB 1 Inlet2 88	65	70	71	68	83	80
SFB 1 Exhaust1 80	45	50	61	58	75	72
SFB 1 Exhaust2 85	60	65	69	66	80	77
SFB 1 SFB2-PF-local 100	65	70	75	72	95	92
SFB 1 SFB2-PF-die 120	88	93	98	95	118	115
SFB 2 Inlet1 81	49	54	62	59	76	73
SFB 2 Inlet2 88	65	70	71	68	83	80
SFB 2 Exhaust1 80	45	50	61	58	75	72
SFB 2 Exhaust2 85	60	65	69	66	80	77
SFB 2 SFB2-PF-local 100	65	70	75	72	95	92
SFB 2 SFB2-PF-die 120	88	93	98	95	118	115
SFB 3 Inlet1 81	49	54	62	59	76	73
SFB 3 Inlet2 88	65	70	71	68	83	80
SFB 3 Exhaust1 80	45	50	61	58	75	72
SFB 3 Exhaust2 85	60	65	69	66	80	77
SFB 3 SFB2-PF-local 100	65	70	75	72	95	92
SFB 3 SFB2-PF-die 120	88	93	98	95	118	115
SFB 4 Inlet1 81	49	54	62	59	76	73
SFB 4 Inlet2 88	65	70	71	68	83	80
SFB 4 Exhaust1 80	45	50	61	58	75	72
SFB 4 Exhaust2 85	60	65	69	66	80	77
SFB 4 SFB2-PF-local 100	65	70	75	72	95	92
SFB 4 SFB2-PF-die 120	88	93	98	95	118	115
SFB 5 Inlet1 81	49	54	62	59	76	73
SFB 5 Inlet2 88	65	70	71	68	83	80

SFB 5 Exhaust1 80	45	50	61	58	75	72
SFB 5 Exhaust2 85	60	65	69	66	80	77
SFB 5 SFB2-PF-local 100	65	70	75	72	95	92
SFB 5 SFB2-PF-die 120	88	93	98	95	118	115
SFB 6 Inlet1 81	49	54	62	59	76	73
SFB 6 Inlet2 88	65	70	71	68	83	80
SFB 6 Exhaust1 80	45	50	61	58	75	72
SFB 6 Exhaust2 85	60	65	69	66	80	77
SFB 6 SFB2-PF-local 100	65	70	75	72	95	92
SFB 6 SFB2-PF-die 120	88	93	98	95	118	115
SFB 7 Inlet1 81	49	54	62	59	76	73
SFB 7 Inlet2 88	65	70	71	68	83	80
SFB 7 Exhaust1 80	45	50	61	58	75	72
SFB 7 Exhaust2 85	60	65	69	66	80	77
SFB 7 SFB2-PF-local 100	65	70	75	72	95	92
SFB 7 SFB2-PF-die 120	88	93	98	95	118	115
FPC 0 95	55	60	75	65	90	80
FPC 3 110	55	60	75	65	105	80
FPC 5 110	55	60	75	65	105	80
FPC 7 95	55	60	75	65	90	80
FPC 9 Intake 95	60	65	75	75	85	85
FPC 9 Exhaust A 95	60	65	75	75	85	85
FPC 9 Exhaust B 95	60	65	75	75	85	85
FPC 9 XL 0 Chip 110	70	75	85	85	102	102
FPC 9 XL 0 XR2 0 Chip 115	75	80	90	90	105	105
FPC 9 XL 0 XR2 1 Chip 115	75	80	90	90	105	105
FPC 9 XL 1 Chip 110	70	75	85	85	102	102
FPC 9 XL 1 XR2 0 Chip 115	75	80	90	90	105	105
FPC 9 XL 1 XR2 1 Chip 115	75	80	90	90	105	105
FPC 9 XM 0 Chip 110	70	75	85	85	100	100

FPC 9 XM 1 Chip 110	70	75	85	85	100	100
FPC 9 XM 2 Chip 110	70	75	85	85	100	100
FPC 9 XM 3 Chip 110	70	75	85	85	100	100
FPC 9 PCIe Switch Chip 120	80	85	95	95	105	105
ADC 0 Intake 80	50	55	65	65	75	75
ADC 0 Exhaust 80	50	55	65	65	75	75
ADC 0 ADC-XF1 100	70	75	90	85	95	90
ADC 0 ADC-XF0 100	70	75	90	85	95	90
ADC 3 Intake 80	50	55	65	65	75	75
ADC 3 Exhaust 80	50	55	65	65	75	75
ADC 3 ADC-XF1 100	70	75	90	85	95	90
ADC 3 ADC-XF0 100	70	75	90	85	95	90
ADC 5 Intake 80	50	55	65	65	75	75
ADC 5 Exhaust 80	50	55	65	65	75	75
ADC 5 ADC-XF1 100	70	75	90	85	95	90
ADC 5 ADC-XF0 100	70	75	90	85	95	90
ADC 7 Intake 80	50	55	65	65	75	75
ADC 7 Exhaust 80	50	55	65	65	75	75
ADC 7 ADC-XF1 100	70	75	90	85	95	90
ADC 7 ADC-XF0 100	70	75	90	85	95	90

### show chassis temperature-thresholds (MX10003 Router)

```
user@host> show chassis temperature-thresholds
```

Shutdown (degrees C) Item	Fan speed		Yellow alarm		Red alarm		Fire
	(degrees C)		(degrees C)		(degrees C)		
	Normal	High	Normal	Bad fan	Normal	Bad fan	
Normal Routing Engine 0 102	48	54	85	85	100	100	
Routing Engine 1 102	48	54	85	85	100	100	
CB 0 Exhaust Temp Sensor 95	60	65	75	75	85	85	
CB 0 Inlet Temp Sensor 95	60	65	75	75	85	85	

CB 0 CPU DIE Temp Sensor 110	83	90	98	98	105	105
CB 1 Exhaust Temp Sensor 95	60	65	75	75	85	85
CB 1 Inlet Temp Sensor 95	60	65	75	75	85	85
CB 1 CPU DIE Temp Sensor 110	83	90	98	98	105	105
FPC 0 Intake Temp Sensor 95	40	45	75	70	85	80
FPC 0 Exhaust-A Temp Sensor 100	55	60	85	80	90	90
FPC 0 Exhaust-B Temp Sensor 100	55	60	85	80	90	90
FPC 0 EA0 Chip 110	87	92	97	97	105	105
FPC 0 EA0-XR0 Chip 125	88	93	98	98	120	120
FPC 0 EA0-XR1 Chip 125	88	93	98	98	120	120
FPC 0 EA1 Chip 110	87	92	97	97	105	105
FPC 0 EA1-XR0 Chip 125	88	93	98	98	120	120
FPC 0 EA1-XR1 Chip 125	88	93	98	98	120	120
FPC 0 EA2 Chip 110	87	92	97	97	105	105
FPC 0 EA2-XR0 Chip 125	88	93	98	98	120	120
FPC 0 EA2-XR1 Chip 125	88	93	98	98	120	120
FPC 0 PF Chip 120	89	94	104	104	120	120
FPC 0 EA0_HMC0 Logic die 125	88	93	103	103	120	120
FPC 0 EA0_HMC0 DRAM botm 125	83	88	98	98	120	120
FPC 0 EA0_HMC1 Logic die 125	88	93	103	103	120	120
FPC 0 EA0_HMC1 DRAM botm 125	83	88	98	98	120	120
FPC 0 EA0_HMC2 Logic die 125	88	93	103	103	120	120
FPC 0 EA0_HMC2 DRAM botm 125	83	88	98	98	120	120
FPC 0 EA1_HMC0 Logic die 125	88	93	103	103	120	120
FPC 0 EA1_HMC0 DRAM botm 125	83	88	98	98	120	120
FPC 0 EA1_HMC1 Logic die 125	88	93	103	103	120	120
FPC 0 EA1_HMC1 DRAM botm 125	83	88	98	98	120	120
FPC 0 EA1_HMC2 Logic die 125	88	93	103	103	120	120
FPC 0 EA1_HMC2 DRAM botm 125	83	88	98	98	120	120
FPC 0 EA2_HMC0 Logic die 125	88	93	103	103	120	120



FPC 0 EA2_HMC0 DRAM botm	83	88	98	98	120	120
125						
FPC 0 EA2_HMC1 Logic die	88	93	103	103	120	120
125						
FPC 0 EA2_HMC1 DRAM botm	83	88	98	98	120	120
125						
FPC 0 EA2_HMC2 Logic die	88	93	103	103	120	120
125						
FPC 0 EA2_HMC2 DRAM botm	83	88	98	98	120	120
125						
FPC 1 Intake Temp Sensor	40	45	75	70	85	80
95						
FPC 1 Exhaust-A Temp Sensor	55	60	85	80	90	90
100						
FPC 1 Exhaust-B Temp Sensor	55	60	85	80	90	90
100						
FPC 1 EA0 Chip	87	92	97	97	105	105
110						
FPC 1 EA0-XR0 Chip	88	93	98	98	120	120
125						
FPC 1 EA0-XR1 Chip	88	93	98	98	120	120
125						
FPC 1 EA1 Chip	87	92	97	97	105	105
110						
FPC 1 EA1-XR0 Chip	88	93	98	98	120	120
125						
FPC 1 EA1-XR1 Chip	88	93	98	98	120	120
125						
FPC 1 EA2 Chip	87	92	97	97	105	105
110						
FPC 1 EA2-XR0 Chip	88	93	98	98	120	120
125						
FPC 1 EA2-XR1 Chip	88	93	98	98	120	120
125						
FPC 1 PF Chip	89	94	104	104	120	120
120						
FPC 1 EA0_HMC0 Logic die	88	93	103	103	120	120
125						
FPC 1 EA0_HMC0 DRAM botm	83	88	98	98	120	120
125						
FPC 1 EA0_HMC1 Logic die	88	93	103	103	120	120
125						
FPC 1 EA0_HMC1 DRAM botm	83	88	98	98	120	120
125						
FPC 1 EA0_HMC2 Logic die	88	93	103	103	120	120
125						
FPC 1 EA0_HMC2 DRAM botm	83	88	98	98	120	120
125						
FPC 1 EA1_HMC0 Logic die	88	93	103	103	120	120
125						
FPC 1 EA1_HMC0 DRAM botm	83	88	98	98	120	120
125						
FPC 1 EA1_HMC1 Logic die	88	93	103	103	120	120
125						
FPC 1 EA1_HMC1 DRAM botm	83	88	98	98	120	120
125						
FPC 1 EA1_HMC2 Logic die	88	93	103	103	120	120
125						
FPC 1 EA1_HMC2 DRAM botm	83	88	98	98	120	120
125						

FPC 1 EA2_HMC0 Logic die	88	93	103	103	120	120
125						
FPC 1 EA2_HMC0 DRAM botm	83	88	98	98	120	120
125						
FPC 1 EA2_HMC1 Logic die	88	93	103	103	120	120
125						
FPC 1 EA2_HMC1 DRAM botm	83	88	98	98	120	120
125						
FPC 1 EA2_HMC2 Logic die	88	93	103	103	120	120
125						
FPC 1 EA2_HMC2 DRAM botm	83	88	98	98	120	120
125						

### show chassis temperature-thresholds (MX10008 Router)

```
user@host> show chassis temperature-thresholds
```

Fire Shutdown		Fan speed		Yellow alarm		Red alarm
		(degrees C)		(degrees C)		(degrees
C)	(degrees C)	Normal	High	Normal	Bad fan	Normal
Item						
Bad fan	Normal					
Routing Engine 0		65	70	95	95	100
100	110					
Routing Engine 1		65	70	95	95	100
100	110					
CB 0 Intake A Temp Sensor		30	35	80	80	85
85	95					
CB 0 Intake B Temp Sensor		30	35	80	80	85
85	95					
CB 0 Exhaust A Temp Sensor		40	45	80	80	85
85	95					
CB 0 Exhaust B Temp Sensor		40	45	80	80	85
85	95					
CB 0 Middle Temp Sensor		40	45	80	80	85
85	95					
CB 1 Intake A Temp Sensor		30	35	80	80	85
85	95					
CB 1 Intake B Temp Sensor		30	35	80	80	85
85	95					
CB 1 Exhaust A Temp Sensor		40	45	80	80	85
85	95					
CB 1 Exhaust B Temp Sensor		40	45	80	80	85
85	95					
CB 1 Middle Temp Sensor		40	45	80	80	85
85	95					
FPC 0 Intake-A Temp Sensor		52	62	72	72	85
85	90					
FPC 0 Exhaust-A Temp Sensor		75	85	98	98	103
103	108					
FPC 0 Exhaust-B Temp Sensor		75	85	98	98	103
103	108					
FPC 0 EA0 Temp Sensor		62	72	90	90	100
100	105					
FPC 0 EA0_XR0 Temp Sensor		77	87	100	100	105
105	108					
FPC 0 EA0_XR1 Temp Sensor		77	87	100	100	105
105	108					
FPC 0 EA1 Temp Sensor		62	72	90	90	100

100	105					
FPC 0 EA1_XR0	Temp Sensor	77	87	100	100	105
105	108					
FPC 0 EA1_XR1	Temp Sensor	77	87	100	100	105
105	108					
FPC 0 EA2	Temp Sensor	62	72	90	90	100
100	105					
FPC 0 EA2_XR0	Temp Sensor	77	87	100	100	105
105	108					
FPC 0 EA2_XR1	Temp Sensor	77	87	100	100	105
105	108					
FPC 0 EA3	Temp Sensor	62	72	90	90	100
100	105					
FPC 0 EA3_XR0	Temp Sensor	77	87	100	100	105
105	108					
FPC 0 EA3_XR1	Temp Sensor	77	87	100	100	105
105	108					
FPC 0 EA4	Temp Sensor	62	72	90	90	100
100	105					
FPC 0 EA4_XR0	Temp Sensor	77	87	100	100	105
105	108					
FPC 0 EA4_XR1	Temp Sensor	77	87	100	100	105
105	108					
FPC 0 EA5	Temp Sensor	62	72	90	90	100
100	105					
FPC 0 EA5_XR0	Temp Sensor	77	87	100	100	105
105	108					
FPC 0 EA5_XR1	Temp Sensor	77	87	100	100	105
105	108					
FPC 0 EA0_HMC0	Logic die	79	89	103	103	110
110	115					
FPC 0 EA0_HMC0	DRAM botm	74	84	98	98	105
105	110					
FPC 0 EA0_HMC1	Logic die	79	89	103	103	110
110	115					
FPC 0 EA0_HMC1	DRAM botm	74	84	98	98	105
105	110					
FPC 0 EA0_HMC2	Logic die	79	89	103	103	110
110	115					
FPC 0 EA0_HMC2	DRAM botm	74	84	98	98	105
105	110					
FPC 0 EA1_HMC0	Logic die	79	89	103	103	110
110	115					
FPC 0 EA1_HMC0	DRAM botm	74	84	98	98	105
105	110					
FPC 0 EA1_HMC1	Logic die	79	89	103	103	110
110	115					
FPC 0 EA1_HMC1	DRAM botm	74	84	98	98	105
105	110					
FPC 0 EA1_HMC2	Logic die	79	89	103	103	110
110	115					
FPC 0 EA1_HMC2	DRAM botm	74	84	98	98	105
105	110					
FPC 0 EA2_HMC0	Logic die	79	89	103	103	110
110	115					
FPC 0 EA2_HMC0	DRAM botm	74	84	98	98	105
105	110					
FPC 0 EA2_HMC1	Logic die	79	89	103	103	110
110	115					
FPC 0 EA2_HMC1	DRAM botm	74	84	98	98	105

105	110					
FPC 0 EA2_HMC2 Logic die	79	89	103	103	110	
110	115					
FPC 0 EA2_HMC2 DRAM botm	74	84	98	98	105	
105	110					
FPC 0 EA3_HMC0 Logic die	79	89	103	103	110	
110	115					
FPC 0 EA3_HMC0 DRAM botm	74	84	98	98	105	
105	110					
FPC 0 EA3_HMC1 Logic die	79	89	103	103	110	
110	115					
FPC 0 EA3_HMC1 DRAM botm	74	84	98	98	105	
105	110					
FPC 0 EA3_HMC2 Logic die	79	89	103	103	110	
110	115					
FPC 0 EA3_HMC2 DRAM botm	74	84	98	98	105	
105	110					
FPC 0 EA4_HMC0 Logic die	79	89	103	103	110	
110	115					
FPC 0 EA4_HMC0 DRAM botm	74	84	98	98	105	
105	110					
FPC 0 EA4_HMC1 Logic die	79	89	103	103	110	
110	115					
FPC 0 EA4_HMC1 DRAM botm	74	84	98	98	105	
105	110					
FPC 0 EA4_HMC2 Logic die	79	89	103	103	110	
110	115					
FPC 0 EA4_HMC2 DRAM botm	74	84	98	98	105	
105	110					
FPC 0 EA5_HMC0 Logic die	79	89	103	103	110	
110	115					
FPC 0 EA5_HMC0 DRAM botm	74	84	98	98	105	
105	110					
FPC 0 EA5_HMC1 Logic die	79	89	103	103	110	
110	115					
FPC 0 EA5_HMC1 DRAM botm	74	84	98	98	105	
105	110					
FPC 0 EA5_HMC2 Logic die	79	89	103	103	110	
110	115					
FPC 0 EA5_HMC2 DRAM botm	74	84	98	98	105	
105	110					
FPC 2 Intake-A Temp Sensor	52	62	72	72	85	
85	90					
FPC 2 Exhaust-A Temp Sensor	75	85	98	98	103	
103	108					
FPC 2 Exhaust-B Temp Sensor	75	85	98	98	103	
103	108					
FPC 2 EA0 Temp Sensor	62	72	90	90	100	
100	105					
FPC 2 EA0_XR0 Temp Sensor	77	87	100	100	105	
105	108					
FPC 2 EA0_XR1 Temp Sensor	77	87	100	100	105	
105	108					
FPC 2 EA1 Temp Sensor	62	72	90	90	100	
100	105					
FPC 2 EA1_XR0 Temp Sensor	77	87	100	100	105	
105	108					
FPC 2 EA1_XR1 Temp Sensor	77	87	100	100	105	
105	108					
FPC 2 EA2 Temp Sensor	62	72	90	90	100	

100	105					
FPC 2 EA2_XR0	Temp Sensor	77	87	100	100	105
105	108					
FPC 2 EA2_XR1	Temp Sensor	77	87	100	100	105
105	108					
FPC 2 EA3	Temp Sensor	62	72	90	90	100
100	105					
FPC 2 EA3_XR0	Temp Sensor	77	87	100	100	105
105	108					
FPC 2 EA3_XR1	Temp Sensor	77	87	100	100	105
105	108					
FPC 2 EA4	Temp Sensor	62	72	90	90	100
100	105					
FPC 2 EA4_XR0	Temp Sensor	77	87	100	100	105
105	108					
FPC 2 EA4_XR1	Temp Sensor	77	87	100	100	105
105	108					
FPC 2 EA5	Temp Sensor	62	72	90	90	100
100	105					
FPC 2 EA5_XR0	Temp Sensor	77	87	100	100	105
105	108					
FPC 2 EA5_XR1	Temp Sensor	77	87	100	100	105
105	108					
FPC 2 EA0_HMC0	Logic die	79	89	103	103	110
110	115					
FPC 2 EA0_HMC0	DRAM botm	74	84	98	98	105
105	110					
FPC 2 EA0_HMC1	Logic die	79	89	103	103	110
110	115					
FPC 2 EA0_HMC1	DRAM botm	74	84	98	98	105
105	110					
FPC 2 EA0_HMC2	Logic die	79	89	103	103	110
110	115					
FPC 2 EA0_HMC2	DRAM botm	74	84	98	98	105
105	110					
FPC 2 EA1_HMC0	Logic die	79	89	103	103	110
110	115					
FPC 2 EA1_HMC0	DRAM botm	74	84	98	98	105
105	110					
FPC 2 EA1_HMC1	Logic die	79	89	103	103	110
110	115					
FPC 2 EA1_HMC1	DRAM botm	74	84	98	98	105
105	110					
FPC 2 EA1_HMC2	Logic die	79	89	103	103	110
110	115					
FPC 2 EA1_HMC2	DRAM botm	74	84	98	98	105
105	110					
FPC 2 EA2_HMC0	Logic die	79	89	103	103	110
110	115					
FPC 2 EA2_HMC0	DRAM botm	74	84	98	98	105
105	110					
FPC 2 EA2_HMC1	Logic die	79	89	103	103	110
110	115					
FPC 2 EA2_HMC1	DRAM botm	74	84	98	98	105
105	110					
FPC 2 EA2_HMC2	Logic die	79	89	103	103	110
110	115					
FPC 2 EA2_HMC2	DRAM botm	74	84	98	98	105
105	110					
FPC 2 EA3_HMC0	Logic die	79	89	103	103	110

110	115					
FPC 2 EA3_HMC0	DRAM botm	74	84	98	98	105
105	110					
FPC 2 EA3_HMC1	Logic die	79	89	103	103	110
110	115					
FPC 2 EA3_HMC1	DRAM botm	74	84	98	98	105
105	110					
FPC 2 EA3_HMC2	Logic die	79	89	103	103	110
110	115					
FPC 2 EA3_HMC2	DRAM botm	74	84	98	98	105
105	110					
FPC 2 EA4_HMC0	Logic die	79	89	103	103	110
110	115					
FPC 2 EA4_HMC0	DRAM botm	74	84	98	98	105
105	110					
FPC 2 EA4_HMC1	Logic die	79	89	103	103	110
110	115					
FPC 2 EA4_HMC1	DRAM botm	74	84	98	98	105
105	110					
FPC 2 EA4_HMC2	Logic die	79	89	103	103	110
110	115					
FPC 2 EA4_HMC2	DRAM botm	74	84	98	98	105
105	110					
FPC 2 EA5_HMC0	Logic die	79	89	103	103	110
110	115					
FPC 2 EA5_HMC0	DRAM botm	74	84	98	98	105
105	110					
FPC 2 EA5_HMC1	Logic die	79	89	103	103	110
110	115					
FPC 2 EA5_HMC1	DRAM botm	74	84	98	98	105
105	110					
FPC 2 EA5_HMC2	Logic die	79	89	103	103	110
110	115					
FPC 2 EA5_HMC2	DRAM botm	74	84	98	98	105
105	110					
FPC 3 Intake-A Temp Sensor		52	62	72	72	85
85	90					
FPC 3 Exhaust-A Temp Sensor		75	85	98	98	103
103	108					
FPC 3 Exhaust-B Temp Sensor		75	85	98	98	103
103	108					
FPC 3 EA0 Temp Sensor		62	72	90	90	100
100	105					
FPC 3 EA0_XR0 Temp Sensor		77	87	100	100	105
105	108					
FPC 3 EA0_XR1 Temp Sensor		77	87	100	100	105
105	108					
FPC 3 EA1 Temp Sensor		62	72	90	90	100
100	105					
FPC 3 EA1_XR0 Temp Sensor		77	87	100	100	105
105	108					
FPC 3 EA1_XR1 Temp Sensor		77	87	100	100	105
105	108					
FPC 3 EA2 Temp Sensor		62	72	90	90	100
100	105					
FPC 3 EA2_XR0 Temp Sensor		77	87	100	100	105
105	108					
FPC 3 EA2_XR1 Temp Sensor		77	87	100	100	105
105	108					
FPC 3 EA3 Temp Sensor		62	72	90	90	100

100	105					
FPC 3 EA3_XR0	Temp Sensor	77	87	100	100	105
105	108					
FPC 3 EA3_XR1	Temp Sensor	77	87	100	100	105
105	108					
FPC 3 EA4	Temp Sensor	62	72	90	90	100
100	105					
FPC 3 EA4_XR0	Temp Sensor	77	87	100	100	105
105	108					
FPC 3 EA4_XR1	Temp Sensor	77	87	100	100	105
105	108					
FPC 3 EA5	Temp Sensor	62	72	90	90	100
100	105					
FPC 3 EA5_XR0	Temp Sensor	77	87	100	100	105
105	108					
FPC 3 EA5_XR1	Temp Sensor	77	87	100	100	105
105	108					
FPC 3 EA0_HMC0	Logic die	79	89	103	103	110
110	115					
FPC 3 EA0_HMC0	DRAM botm	74	84	98	98	105
105	110					
FPC 3 EA0_HMC1	Logic die	79	89	103	103	110
110	115					
FPC 3 EA0_HMC1	DRAM botm	74	84	98	98	105
105	110					
FPC 3 EA0_HMC2	Logic die	79	89	103	103	110
110	115					
FPC 3 EA0_HMC2	DRAM botm	74	84	98	98	105
105	110					
FPC 3 EA1_HMC0	Logic die	79	89	103	103	110
110	115					
FPC 3 EA1_HMC0	DRAM botm	74	84	98	98	105
105	110					
FPC 3 EA1_HMC1	Logic die	79	89	103	103	110
110	115					
FPC 3 EA1_HMC1	DRAM botm	74	84	98	98	105
105	110					
FPC 3 EA1_HMC2	Logic die	79	89	103	103	110
110	115					
FPC 3 EA1_HMC2	DRAM botm	74	84	98	98	105
105	110					
FPC 3 EA2_HMC0	Logic die	79	89	103	103	110
110	115					
FPC 3 EA2_HMC0	DRAM botm	74	84	98	98	105
105	110					
FPC 3 EA2_HMC1	Logic die	79	89	103	103	110
110	115					
FPC 3 EA2_HMC1	DRAM botm	74	84	98	98	105
105	110					
FPC 3 EA2_HMC2	Logic die	79	89	103	103	110
110	115					
FPC 3 EA2_HMC2	DRAM botm	74	84	98	98	105
105	110					
FPC 3 EA3_HMC0	Logic die	79	89	103	103	110
110	115					
FPC 3 EA3_HMC0	DRAM botm	74	84	98	98	105
105	110					
FPC 3 EA3_HMC1	Logic die	79	89	103	103	110
110	115					
FPC 3 EA3_HMC1	DRAM botm	74	84	98	98	105

105	110					
FPC 3 EA3_HMC2 Logic die	79	89	103	103	110	
110	115					
FPC 3 EA3_HMC2 DRAM botm	74	84	98	98	105	
105	110					
FPC 3 EA4_HMC0 Logic die	79	89	103	103	110	
110	115					
FPC 3 EA4_HMC0 DRAM botm	74	84	98	98	105	
105	110					
FPC 3 EA4_HMC1 Logic die	79	89	103	103	110	
110	115					
FPC 3 EA4_HMC1 DRAM botm	74	84	98	98	105	
105	110					
FPC 3 EA4_HMC2 Logic die	79	89	103	103	110	
110	115					
FPC 3 EA4_HMC2 DRAM botm	74	84	98	98	105	
105	110					
FPC 3 EA5_HMC0 Logic die	79	89	103	103	110	
110	115					
FPC 3 EA5_HMC0 DRAM botm	74	84	98	98	105	
105	110					
FPC 3 EA5_HMC1 Logic die	79	89	103	103	110	
110	115					
FPC 3 EA5_HMC1 DRAM botm	74	84	98	98	105	
105	110					
FPC 3 EA5_HMC2 Logic die	79	89	103	103	110	
110	115					
FPC 3 EA5_HMC2 DRAM botm	74	84	98	98	105	
105	110					
SFB 0 Intake-A	65	75	85	85	95	
95	105					
SFB 0 Intake-B	65	75	85	85	95	
95	105					
SFB 0 Exhaust-A	75	85	95	95	95	
95	105					
SFB 0 Exhaust-B	75	85	95	95	95	
95	105					
SFB 0 PF0	65	75	100	100	105	
105	115					
SFB 0 PF1	65	75	100	100	105	
105	115					
SFB 1 Intake-A	65	75	85	85	95	
95	105					
SFB 1 Intake-B	65	75	85	85	95	
95	105					
SFB 1 Exhaust-A	75	85	95	95	95	
95	105					
SFB 1 Exhaust-B	75	85	95	95	95	
95	105					
SFB 1 PF0	65	75	100	100	105	
105	115					
SFB 1 PF1	65	75	100	100	105	
105	115					
SFB 2 Intake-A	65	75	85	85	95	
95	105					
SFB 2 Intake-B	65	75	85	85	95	
95	105					
SFB 2 Exhaust-A	75	85	95	95	95	
95	105					
SFB 2 Exhaust-B	75	85	95	95	95	



95	105					
SFB 2 PF0		65	75	100	100	105
105	115					
SFB 2 PF1		65	75	100	100	105
105	115					
SFB 3 Intake-A		65	75	85	85	95
95	105					
SFB 3 Intake-B		65	75	85	85	95
95	105					
SFB 3 Exhaust-A		75	85	95	95	95
95	105					
SFB 3 Exhaust-B		75	85	95	95	95
95	105					
SFB 3 PF0		65	75	100	100	105
105	115					
SFB 3 PF1		65	75	100	100	105
105	115					
SFB 4 Intake-A		65	75	85	85	95
95	105					
SFB 4 Intake-B		65	75	85	85	95
95	105					
SFB 4 Exhaust-A		75	85	95	95	95
95	105					
SFB 4 Exhaust-B		75	85	95	95	95
95	105					
SFB 4 PF0		65	75	100	100	105
105	115					
SFB 4 PF1		65	75	100	100	105
105	115					
SFB 5 Intake-A		65	75	85	85	95
95	105					
SFB 5 Intake-B		65	75	85	85	95
95	105					
SFB 5 Exhaust-A		75	85	95	95	95
95	105					
SFB 5 Exhaust-B		75	85	95	95	95
95	105					
SFB 5 PF0		65	75	100	100	105
105	115					
SFB 5 PF1		65	75	100	100	105
105	115					

### show chassis temperature-thresholds (MX204 Router)

```
user@host> show chassis temperature-thresholds
```

Fire Shutdown		Fan speed		Yellow alarm		Red alarm
C)	(degrees C)	(degrees C)		(degrees C)		(degrees
Item		Normal	High	Normal	Bad fan	Normal
Bad fan	Normal					
Routing Engine		48	54	85	85	100
100	102					
CB Top Right Inlet Sensor		35	40	63	63	85
85	95					
CB Top Left Inlet Sensor		40	45	65	65	85
85	95					
CB Top Right Exhaust Sensor		45	50	68	68	85

85	95				
CB Top Left Exhaust Sensor	65	70	78	78	85
85	95				
CB CPU Core-0 Temp	65	70	80	80	90
90	100				
CB CPU Core-1 Temp	65	70	80	80	90
90	100				
CB CPU Core-2 Temp	65	70	80	80	90
90	100				
CB CPU Core-3 Temp	65	70	80	80	90
90	100				
CB CPU Core-4 Temp	65	70	80	80	90
90	100				
CB CPU Core-5 Temp	65	70	80	80	90
90	100				
CB CPU Core-6 Temp	65	70	80	80	90
90	100				
CB CPU Core-7 Temp	65	70	80	80	90
90	100				
FPC EA0_HMC0 Logic die	85	90	95	95	105
105	110				
FPC EA0_HMC0 DRAM botm	80	85	90	90	105
105	110				
FPC EA0_HMC1 Logic die	85	90	95	95	105
105	110				
FPC EA0_HMC1 DRAM botm	80	85	90	90	105
105	110				
FPC EA0 Chip	92	97	103	103	109
109	115				
FPC EA0-XR0 Chip	85	90	98	98	103
103	110				
FPC EA0-XR1 Chip	85	90	98	98	103
103	110				

### show chassis temperature-thresholds (PTX10008 Routers)

```
user@host> show chassis temperature-thresholds
```

Shutdown (degrees C) Item	Fan speed		Yellow alarm		Red alarm		Fire
	(degrees C)		(degrees C)		(degrees C)		
	Normal	High	Normal	Bad fan	Normal	Bad fan	
Normal							
Routing Engine 0 102	48	54	85	85	100	100	
Routing Engine 1 102	48	54	85	85	100	100	
CB 0 Intake Temp Sensor 95	30	35	80	80	85	85	
CB 0 Exhaust Temp Sensor 95	30	35	80	80	85	85	
CB 0 CPU Die Temp Sensor 110	40	45	95	95	100	100	
CB 1 Intake Temp Sensor 95	30	35	80	80	85	85	
CB 1 Exhaust Temp Sensor 95	30	35	80	80	85	85	
CB 1 CPU Die Temp Sensor 110	40	45	95	95	100	100	

FPC 0 Intake-A Temp Sensor	30	35	80	80	85	85
95						
FPC 0 Intake-B Temp Sensor	30	35	80	80	85	85
95						
FPC 0 Exhaust-A Temp Sensor	30	35	80	80	85	85
95						
FPC 0 Exhaust-B Temp Sensor	30	35	80	80	85	85
95						
FPC 0 Exhaust-C Temp Sensor	30	35	80	80	85	85
95						
FPC 0 PE0 Temp Sensor	40	45	100	100	105	105
115						
FPC 0 PE1 Temp Sensor	40	45	100	100	105	105
115						
FPC 0 PE2 Temp Sensor	40	45	100	100	105	105
115						
FPC 0 LCPU Temp Sensor	40	45	95	95	100	100
110						
FPC 5 Intake-A Temp Sensor	30	35	80	80	85	85
95						
FPC 5 Intake-B Temp Sensor	30	35	80	80	85	85
95						
FPC 5 Exhaust-A Temp Sensor	30	35	80	80	85	85
95						
FPC 5 Exhaust-B Temp Sensor	30	35	80	80	85	85
95						
FPC 5 Exhaust-C Temp Sensor	30	35	80	80	85	85
95						
FPC 5 PE0 Temp Sensor	40	45	100	100	105	105
115						
FPC 5 PE1 Temp Sensor	40	45	100	100	105	105
115						
FPC 5 PE2 Temp Sensor	40	45	100	100	105	105
115						
FPC 5 PE3 Temp Sensor	40	45	100	100	105	105
115						
FPC 5 PE4 Temp Sensor	40	45	100	100	105	105
115						
FPC 5 PE5 Temp Sensor	40	45	100	100	105	105
115						
FPC 5 LCPU Temp Sensor	40	45	95	95	100	100
110						
FPC 6 Intake-A Temp Sensor	30	35	80	80	85	85
95						
FPC 6 Intake-B Temp Sensor	30	35	80	80	85	85
95						
FPC 6 Exhaust-A Temp Sensor	30	35	80	80	85	85
95						
FPC 6 Exhaust-B Temp Sensor	30	35	80	80	85	85
95						
FPC 6 Exhaust-C Temp Sensor	30	35	80	80	85	85
95						
FPC 6 PE0 Temp Sensor	40	45	100	100	105	105
115						
FPC 6 PE1 Temp Sensor	40	45	100	100	105	105
115						
FPC 6 PE2 Temp Sensor	40	45	100	100	105	105
115						
FPC 6 PE3 Temp Sensor	40	45	100	100	105	105
115						

FPC 6 PE4 Temp Sensor 115	40	45	100	100	105	105
FPC 6 PE5 Temp Sensor 115	40	45	100	100	105	105
FPC 6 LCPU Temp Sensor 110	40	45	95	95	100	100
SIB 0 Intake-A Temp Sensor 105	40	45	90	90	95	95
SIB 0 Intake-B Temp Sensor 105	40	45	90	90	95	95
SIB 0 Exhaust-A Temp Sensor 105	40	45	90	90	95	95
SIB 0 Exhaust-B Temp Sensor 105	40	45	90	90	95	95
SIB 0 PF0 Temp Sensor 115	50	55	100	100	105	105
SIB 0 PF1 Temp Sensor 115	50	55	100	100	105	105
SIB 1 Intake-A Temp Sensor 105	40	45	90	90	95	95
SIB 1 Intake-B Temp Sensor 105	40	45	90	90	95	95
SIB 1 Exhaust-A Temp Sensor 105	40	45	90	90	95	95
SIB 1 Exhaust-B Temp Sensor 105	40	45	90	90	95	95
SIB 1 PF0 Temp Sensor 115	50	55	100	100	105	105
SIB 1 PF1 Temp Sensor 115	50	55	100	100	105	105

### show chassis temperature-thresholds (T4000 Core Routers)

```
user@host> show chassis temperature-thresholds
```

Item	Fan speed		Yellow alarm		Red alarm		Fire Shutdown
	(degrees C) Normal	High	(degrees C) Normal	Bad fan	(degrees C) Normal	Bad fan	(degrees C) Normal
Chassis default	48	54	65	55	75	65	100
Routing Engine 0	55	65	85	85	100	100	102
Routing Engine 1	55	65	85	85	100	100	102
FPC 0	63	68	75	70	90	83	95
FPC 3	63	68	75	70	90	83	95
FPC 5	56	62	75	63	83	76	95
FPC 6	63	68	75	70	90	83	95
SIB 0	64	70	76	72	87	84	95
SIB 1	64	70	76	72	87	84	95
SIB 2	64	70	76	72	87	84	95
SIB 3	64	70	76	72	87	84	95
SIB 4	64	70	76	72	87	84	95

### show chassis temperature-thresholds (TX Matrix Plus Router)

```
user@host> show chassis temperature-thresholds
```

```
sfc0-re0:
```

```
-----
```

Item	Fan speed (degrees C)		Yellow alarm (degrees C)		Red alarm (degrees C)	
	Normal	High	Normal	Bad fan	Normal	Bad fan
Chassis default	48	54	65	55	75	65
Routing Engine 0	55	65	85	85	100	100
Routing Engine 1	55	65	85	85	100	100
SIB F13 0	64	70	76	72	90	84
SIB F13 3	64	70	76	72	90	84
SIB F13 6	64	70	76	72	90	84
SIB F13 8	64	70	76	72	90	84
SIB F13 11	64	70	76	72	90	84
SIB F13 12	64	70	76	72	90	84
SIB F2S 16	64	70	76	72	90	84
SIB F2S 17	64	70	76	72	90	84
SIB F2S 18	64	70	76	72	90	84
SIB F2S 19	64	70	76	72	90	84
SIB F2S 20	64	70	76	72	90	84
SIB F2S 21	64	70	76	72	90	84
SIB F2S 22	64	70	76	72	90	84
SIB F2S 23	64	70	76	72	90	84
SIB F2S 24	64	70	76	72	90	84
SIB F2S 25	64	70	76	72	90	84
SIB F2S 26	64	70	76	72	90	84
SIB F2S 27	64	70	76	72	90	84
SIB F2S 28	64	70	76	72	90	84
SIB F2S 29	64	70	76	72	90	84
SIB F2S 30	64	70	76	72	90	84
SIB F2S 31	64	70	76	72	90	84
SIB F2S 32	64	70	76	72	90	84
SIB F2S 33	64	70	76	72	90	84
SIB F2S 34	64	70	76	72	90	84
SIB F2S 35	64	70	76	72	90	84

lcc0-re0:

Item	Fan speed (degrees C)		Yellow alarm (degrees C)		Red alarm (degrees C)	
	Normal	High	Normal	Bad fan	Normal	Bad fan
Chassis default	48	54	65	55	75	65
Routing Engine 0	55	65	85	85	100	100
Routing Engine 1	55	65	85	85	100	100
FPC 1	56	62	75	63	83	76
FPC 3	56	62	75	63	83	76
FPC 4	56	62	75	63	83	76
FPC 6	56	62	75	63	83	76
FPC 7	56	62	75	63	83	76
SIB 0	48	54	65	60	80	75
SIB 1	48	54	65	60	80	75
SIB 2	48	54	65	60	80	75
SIB 3	48	54	65	60	80	75
SIB 4	48	54	65	60	80	75

lcc1-re0:

Item	Fan speed (degrees C)		Yellow alarm (degrees C)		Red alarm (degrees C)	
	Normal	High	Normal	Bad fan	Normal	Bad fan
Chassis default	48	54	65	55	75	65
Routing Engine 0	55	65	85	85	100	100
Routing Engine 1	55	65	85	85	100	100

FPC 1	56	62	75	63	83	76
FPC 3	56	62	75	63	83	76
FPC 4	56	62	75	63	83	76
FPC 6	56	62	75	63	83	76
...						

### show chassis temperature-thresholds lcc (TX Matrix Plus Router)

```
user@host> show chassis temperature-thresholds lcc 1
```

```
lcc1-re0:
```

Item	Fan speed (degrees C)		Yellow alarm (degrees C)		Red alarm (degrees C)	
	Normal	High	Normal	Bad fan	Normal	Bad fan
Chassis default	48	54	65	55	75	65
Routing Engine 0	55	65	85	85	100	100
Routing Engine 1	55	65	85	85	100	100
FPC 1	56	62	75	63	83	76
FPC 3	56	62	75	63	83	76
FPC 4	56	62	75	63	83	76
FPC 6	56	62	75	63	83	76
SIB 0	48	54	65	60	80	75
SIB 1	48	54	65	60	80	75
SIB 2	48	54	65	60	80	75
SIB 3	48	54	65	60	80	75
SIB 4	48	54	65	60	80	75

### show chassis temperature-thresholds sfc (TX Matrix Plus Router)

```
user@host> show chassis temperature-thresholds sfc 0
```

```
sfc0-re0:
```

Item	Fan speed (degrees C)		Yellow alarm (degrees C)		Red alarm (degrees C)	
	Normal	High	Normal	Bad fan	Normal	Bad fan
Chassis default	48	54	65	55	75	65
Routing Engine 0	55	65	85	85	100	100
Routing Engine 1	55	65	85	85	100	100
SIB F13 0	64	70	76	72	90	84
SIB F13 3	64	70	76	72	90	84
SIB F13 6	64	70	76	72	90	84
SIB F13 8	64	70	76	72	90	84
SIB F13 11	64	70	76	72	90	84
SIB F13 12	64	70	76	72	90	84
SIB F2S 16	64	70	76	72	90	84
SIB F2S 17	64	70	76	72	90	84
SIB F2S 18	64	70	76	72	90	84
SIB F2S 19	64	70	76	72	90	84
SIB F2S 20	64	70	76	72	90	84
SIB F2S 21	64	70	76	72	90	84
SIB F2S 22	64	70	76	72	90	84
SIB F2S 23	64	70	76	72	90	84
SIB F2S 24	64	70	76	72	90	84
SIB F2S 25	64	70	76	72	90	84
SIB F2S 26	64	70	76	72	90	84
SIB F2S 27	64	70	76	72	90	84
SIB F2S 28	64	70	76	72	90	84

SIB F2S 29	64	70	76	72	90	84
SIB F2S 30	64	70	76	72	90	84
SIB F2S 31	64	70	76	72	90	84
SIB F2S 32	64	70	76	72	90	84
SIB F2S 33	64	70	76	72	90	84
SIB F2S 34	64	70	76	72	90	84
SIB F2S 35	64	70	76	72	90	84

### show chassis temperature-thresholds (TX Matrix Plus routers with 3D SIBs)

```
user@host> show chassis temperature-thresholds
```

```
sfc0-re0:
```

Shutdown (degrees C) Item	Fan speed (degrees C)		Yellow alarm (degrees C)		Red alarm (degrees C)		Fire
	Normal	High	Normal	Bad fan	Normal	Bad fan	
Normal							
Chassis default	48	54	65	55	75	65	
100							
Routing Engine 0	70	75	90	87	102	97	
115							
Routing Engine 1	70	75	90	87	102	97	
115							
SIB F13 0 Board	60	65	78	75	85	80	
95							
SIB F13 0 XF Junction	70	75	82	74	105	100	
107							
SIB F13 4 Board	60	65	78	75	85	80	
95							
SIB F13 4 XF Junction	70	75	82	74	105	100	
107							
SIB F13 6 Board	60	65	78	75	85	80	
95							
SIB F13 6 XF Junction	70	75	82	74	105	100	
107							
SIB F2S 16 Board	60	65	78	75	85	80	
95							
SIB F2S 16 XF Junction	70	75	82	74	105	100	
107							
SIB F2S 17 Board	60	65	78	75	85	80	
95							
SIB F2S 17 XF Junction	70	75	82	74	105	100	
107							
SIB F2S 18 Board	60	65	78	75	85	80	
95							
SIB F2S 18 XF Junction	70	75	82	74	105	100	
107							
SIB F2S 19 Board	60	65	78	75	85	80	
95							
SIB F2S 19 XF Junction	70	75	82	74	105	100	
107							
SIB F2S 24 Board	60	65	78	75	85	80	
95							
SIB F2S 24 XF Junction	70	75	82	74	105	100	
107							
SIB F2S 25 Board	60	65	78	75	85	80	
95							

SIB F2S 25 XF Junction 107	70	75	82	74	105	100	
SIB F2S 26 Board 95	60	65	78	75	85	80	
SIB F2S 26 XF Junction 107	70	75	82	74	105	100	
SIB F2S 27 Board 95	60	65	78	75	85	80	
SIB F2S 27 XF Junction 107	70	75	82	74	105	100	
lcc0-re0:							
-----							
Shutdown	Fan speed		Yellow alarm		Red alarm		Fire
	(degrees C)		(degrees C)		(degrees C)		
Item	Normal	High	Normal	Bad fan	Normal	Bad fan	
Normal							
Chassis default 100	48	54	65	55	75	65	
Routing Engine 0 102	55	65	85	85	100	100	
FPC 0 95	63	68	75	70	90	83	
FPC 1 95	56	62	75	63	83	76	
FPC 7 95	56	62	75	63	83	76	
SIB 0 95	64	70	76	72	87	84	
SIB 0 ASIC Junction 107	63	68	75	70	105	100	
SIB 2 95	64	70	76	72	87	84	
SIB 2 ASIC Junction 107	63	68	75	70	105	100	
SIB 3 95	64	70	76	72	87	84	
SIB 3 ASIC Junction 107	63	68	75	70	105	100	

### show chassis temperature-thresholds (QFX3500 Switch and QFX3600)

```
user@switch> show chassis temperature-thresholds
```

Item	Fan speed		Yellow alarm		Red alarm	
	(degrees C)		(degrees C)		(degrees C)	
Normal	Normal	High	Normal	Bad fan	Normal	Bad fan
FPC Sensor TopLeft I	48	56	53	43	56	46
FPC Sensor TopRight I	46	54	51	41	54	44
FPC Sensor TopLeft E	58	65	62	52	65	55
FPC Sensor TopRight E	56	64	61	51	64	54
FPC Sensor TopMiddle I	58	64	61	51	64	54
FPC Sensor TopMiddle E	67	74	71	61	74	64
FPC Sensor Bottom I	59	67	64	54	67	57
FPC Sensor Bottom E	66	73	70	60	73	63
FPC Sensor Die Temp	69	75	72	62	75	65



FPC Sensor Mgmt Brd I	46	54	51	41	54	44
FPC Sensor Switch I	56	63	60	50	63	53

### show chassis temperature-thresholds interconnect-device (QFabric System)

```
user@switch> show chassis temperature-thresholds interconnect-device interconnect1
```

Item	Fan speed		Yellow alarm		Red alarm	
	Normal	High	Normal	Bad fan	Normal	Bad fan
Chassis default	48	54	65	55	75	65

### show chassis temperature-thresholds (PTX5000 Packet Transport Router)

```
user@switch> show chassis temperature-thresholds
```

```
user@switch> show chassis temperature-thresholds
```

Shutdown (degrees C) Item	Fan speed		Yellow alarm		Red alarm		Fire
	(degrees C)		(degrees C)		(degrees C)		
Normal	Normal	High	Normal	Bad fan	Normal	Bad fan	
Routing Engine 0	80	90	95	85	105	95	
115							
CB 0 Exhaust A	60	65	78	75	85	80	
95							
CB 0 Exhaust B	60	65	78	75	85	80	
95							
CB 1 Exhaust A	60	65	78	75	85	80	
95							
CB 1 Exhaust B	60	65	78	75	85	80	
95							
FPC 3 Exhaust A	80	90	95	85	105	95	
115							
FPC 3 Exhaust B	80	90	95	85	105	95	
115							
FPC 3 TL5	80	90	95	85	105	95	
115							
FPC 3 TQ5	80	90	95	85	105	95	
115							
FPC 3 TL6	80	90	95	85	105	95	
115							
FPC 3 TQ6	80	90	95	85	105	95	
115							
FPC 3 TL1	80	90	95	85	105	95	
115							
FPC 3 TQ1	80	90	95	85	105	95	
115							
FPC 3 TL2	80	90	95	85	105	95	
115							
FPC 3 TQ2	80	90	95	85	105	95	
115							
FPC 3 TL4	80	90	95	85	105	95	
115							
FPC 3 TQ4	80	90	95	85	105	95	
115							
FPC 3 TL7	80	90	95	85	105	95	

115						
FPC 3 TQ7	80	90	95	85	105	95
115						
FPC 3 TL0	80	90	95	85	105	95
115						
FPC 3 TQ0	80	90	95	85	105	95
115						
FPC 3 TL3	80	90	95	85	105	95
115						
FPC 3 TQ3	80	90	95	85	105	95
115						
SIB 0 Exhaust	60	65	78	75	85	80
95						
SIB 0 Junction	75	80	90	85	105	95
115						
SIB 1 Exhaust	60	65	78	75	85	80
95						
SIB 1 Junction	75	80	90	85	105	95
115						
SIB 2 Exhaust	60	65	78	75	85	80
95						
SIB 2 Junction	75	80	90	85	105	95
115						
SIB 3 Exhaust	60	65	78	75	85	80
95						
SIB 3 Junction	75	80	90	85	105	95
115						
SIB 4 Exhaust	60	65	78	75	85	80
95						
SIB 4 Junction	75	80	90	85	105	95
115						
SIB 5 Exhaust	60	65	78	75	85	80
95						
SIB 5 Junction	75	80	90	85	105	95
115						
SIB 6 Exhaust	60	65	78	75	85	80
95						
SIB 6 Junction	75	80	90	85	105	95
115						
SIB 7 Exhaust	60	65	78	75	85	80
95						
SIB 7 Junction	75	80	90	85	105	95
115						
SIB 8 Exhaust	60	65	78	75	85	80
95						
SIB 8 Junction	75	80	90	85	105	95
115						

### show chassis temperature-thresholds (PTX1000 Packet Transport Router)

```
user@host> show chassis temperature-thresholds
```

Shutdown (degrees C) Item	Fan speed		Yellow alarm		Red alarm		Fire
	(degrees C)		(degrees C)		(degrees C)		
	Normal	High	Normal	Bad fan	Normal	Bad fan	

Normal						
FPC 0 Intake Temp Sensor	30	65	65	65	70	70
75						
FPC 0 Exhaust Temp Sensor	30	65	65	65	70	70
75						
FPC 0 Mezz Temp Sensor 0	30	65	65	65	70	70
75						
FPC 0 Mezz Temp Sensor 1	30	65	65	65	70	70
75						
FPC 0 PE2 Temp Sensor	50	90	90	90	100	100
103						
FPC 0 PE1 Temp Sensor	50	90	90	90	100	100
103						
FPC 0 PF0 Temp Sensor	50	90	90	90	100	100
103						
FPC 0 PE0 Temp Sensor	50	90	90	90	100	100
103						
FPC 0 PE5 Temp Sensor	50	90	90	90	100	100
103						
FPC 0 PE4 Temp Sensor	50	90	90	90	100	100
103						
FPC 0 PF1 Temp Sensor	50	90	90	90	100	100
103						
FPC 0 PE3 Temp Sensor	50	90	90	90	100	100
103						
FPC 0 CPU Die Temp Sensor	50	90	90	90	100	100
103						
FPC 0 OCX0 Temp Sensor	50	90	90	90	100	100
103						

### show chassis temperature-thresholds (MX Routers with Media Services Blade [MSB])

```
user@switch> show chassis temperature-thresholds
```

Fan speed	Yellow alarm		Red alarm		Fire Shutdown	
(degrees C)	(degrees C)		(degrees C)		(degrees C)	
Item	Normal	High	Normal	Bad fan	Normal	Bad fan
Normal						
Chassis default	48	54	65	55	75	65
100						
Routing Engine 0	70	80	95	95	110	110
112						
Routing Engine 1	70	80	95	95	110	110
112						
FPC 0	55	60	75	65	90	80
95						
FPC 1	55	60	75	65	90	80
95						
FPC 2	55	60	75	65	90	80
95						
FPC 4	55	60	75	65	90	80
95						
FPC 5	55	60	75	65	90	80
95						

## show chassis temperature-thresholds (EX9251 Switches)

user@switch&gt; show chassis temperature-thresholds

Shutdown	Fan speed		Yellow alarm		Red alarm		Fire
(degrees C)	(degrees C)		(degrees C)		(degrees C)		
Item	Normal	High	Normal	Bad fan	Normal	Bad fan	
Normal							
Routing Engine			48	54	85	85	100
100 102							
CB Top Right Inlet Sensor			35	40	63	63	85
85 95							
CB Top Left Inlet Sensor			40	45	65	65	85
85 95							
CB Top Right Exhaust Sensor			45	50	68	68	85
85 95							
CB Top Left Exhaust Sensor			65	70	78	78	85
85 95							
CB CPU Core-0 Temp			65	70	80	80	90
90 100							
CB CPU Core-1 Temp			65	70	80	80	90
90 100							
CB CPU Core-2 Temp			65	70	80	80	90
90 100							
CB CPU Core-3 Temp			65	70	80	80	90
90 100							
CB CPU Core-4 Temp			65	70	80	80	90
90 100							
CB CPU Core-5 Temp			65	70	80	80	90
90 100							
CB CPU Core-6 Temp			65	70	80	80	90
90 100							
CB CPU Core-7 Temp			65	70	80	80	90
90 100							
FPC EA0_HMC0 Logic die			85	90	95	95	105
105 110							
FPC EA0_HMC0 DRAM botm			80	85	90	90	105
105 110							
FPC EA0_HMC1 Logic die			85	90	95	95	105
105 110							
FPC EA0_HMC1 DRAM botm			80	85	90	90	105
105 110							
FPC EA0 Chip			92	97	103	103	109
109 115							
FPC EA0-XR0 Chip			85	90	98	98	103
103 110							
FPC EA0-XR1 Chip			85	90	98	98	103
103 110							

## show chassis temperature-thresholds (EX9253 switches)

user@switch&gt; show chassis temperature-thresholds

Shutdown	Fan speed		Yellow alarm		Red alarm		Fire
(degrees C)	(degrees C)		(degrees C)		(degrees C)		

(degrees C)						
Item	Normal	High	Normal	Bad fan	Normal	Bad fan
Normal						
Routing Engine 0			48	54	85	100
100 102						
CB 0 Exhaust Temp Sensor			60	65	75	85
85 95						
CB 0 Inlet Temp Sensor			60	65	75	85
85 95						
CB 0 CPU DIE Temp Sensor			83	90	98	105
105 110						
CB 1 Exhaust Temp Sensor			60	65	75	85
85 95						
CB 1 Inlet Temp Sensor			60	65	75	85
85 95						
CB 1 CPU DIE Temp Sensor			83	90	98	105
105 110						
FPC 0 Intake Temp Sensor			40	45	75	85
80 95						
FPC 0 Exhaust-A Temp Sensor			55	60	85	90
90 100						
FPC 0 Exhaust-B Temp Sensor			55	60	85	90
90 100						
FPC 0 EA0 Chip			87	92	97	105
105 110						
FPC 0 EA0-XR0 Chip			88	93	98	120
120 125						
FPC 0 EA0-XR1 Chip			88	93	98	120
120 125						
FPC 0 EA1 Chip			87	92	97	105
105 110						
FPC 0 EA1-XR0 Chip			88	93	98	120
120 125						
FPC 0 EA1-XR1 Chip			88	93	98	120
120 125						
FPC 0 EA2 Chip			87	92	97	105
105 110						
FPC 0 EA2-XR0 Chip			88	93	98	120
120 125						
FPC 0 EA2-XR1 Chip			88	93	98	120
120 125						
FPC 0 PF Chip			89	94	104	120
120 120						
FPC 0 EA0_HMC0 Logic die			88	93	103	120
120 125						
FPC 0 EA0_HMC0 DRAM botm			83	88	98	120
120 125						
FPC 0 EA0_HMC1 Logic die			88	93	103	120
120 125						
FPC 0 EA0_HMC1 DRAM botm			83	88	98	120
120 125						
FPC 0 EA0_HMC2 Logic die			88	93	103	120
120 125						
FPC 0 EA0_HMC2 DRAM botm			83	88	98	120
120 125						
FPC 0 EA1_HMC0 Logic die			88	93	103	120
120 125						
FPC 0 EA1_HMC0 DRAM botm			83	88	98	120
120 125						
FPC 0 EA1_HMC1 Logic die			88	93	103	120

120	125				
FPC 0 EA1_HMC1 DRAM botm		83	88	98	98 120
120	125				
FPC 0 EA1_HMC2 Logic die		88	93	103	103 120
120	125				
FPC 0 EA1_HMC2 DRAM botm		83	88	98	98 120
120	125				
FPC 0 EA2_HMC0 Logic die		88	93	103	103 120
120	125				
FPC 0 EA2_HMC0 DRAM botm		83	88	98	98 120
120	125				
FPC 0 EA2_HMC1 Logic die		88	93	103	103 120
120	125				
FPC 0 EA2_HMC1 DRAM botm		83	88	98	98 120
120	125				
FPC 0 EA2_HMC2 Logic die		88	93	103	103 120
120	125				
FPC 0 EA2_HMC2 DRAM botm		83	88	98	98 120
120	125				
FPC 1 Intake Temp Sensor		40	45	75	70 85
80	95				
FPC 1 Exhaust-A Temp Sensor		55	60	85	80 90
90	100				
FPC 1 Exhaust-B Temp Sensor		55	60	85	80 90
90	100				
FPC 1 EA0 Chip		87	92	97	97 105
105	110				
FPC 1 EA0-XR0 Chip		88	93	98	98 120
120	125				
FPC 1 EA0-XR1 Chip		88	93	98	98 120
120	125				
FPC 1 EA1 Chip		87	92	97	97 105
105	110				
FPC 1 EA1-XR0 Chip		88	93	98	98 120
120	125				
FPC 1 EA1-XR1 Chip		88	93	98	98 120
120	125				
FPC 1 EA2 Chip		87	92	97	97 105
105	110				
FPC 1 EA2-XR0 Chip		88	93	98	98 120
120	125				
FPC 1 EA2-XR1 Chip		88	93	98	98 120
120	125				
FPC 1 PF Chip		89	94	104	104 120
120	120				
FPC 1 EA0_HMC0 Logic die		88	93	103	103 120
120	125				
FPC 1 EA0_HMC0 DRAM botm		83	88	98	98 120
120	125				
FPC 1 EA0_HMC1 Logic die		88	93	103	103 120
120	125				
FPC 1 EA0_HMC1 DRAM botm		83	88	98	98 120
120	125				
FPC 1 EA0_HMC2 Logic die		88	93	103	103 120
120	125				
FPC 1 EA0_HMC2 DRAM botm		83	88	98	98 120
120	125				
FPC 1 EA1_HMC0 Logic die		88	93	103	103 120
120	125				
FPC 1 EA1_HMC0 DRAM botm		83	88	98	98 120

120	125					
FPC 1 EA1_HMC1 Logic die		88	93	103	103	120
120	125					
FPC 1 EA1_HMC1 DRAM botm		83	88	98	98	120
120	125					
FPC 1 EA1_HMC2 Logic die		88	93	103	103	120
120	125					
FPC 1 EA1_HMC2 DRAM botm		83	88	98	98	120
120	125					
FPC 1 EA2_HMC0 Logic die		88	93	103	103	120
120	125					
FPC 1 EA2_HMC0 DRAM botm		83	88	98	98	120
120	125					
FPC 1 EA2_HMC1 Logic die		88	93	103	103	120
120	125					
FPC 1 EA2_HMC1 DRAM botm		83	88	98	98	120
120	125					
FPC 1 EA2_HMC2 Logic die		88	93	103	103	120
120	125					
FPC 1 EA2_HMC2 DRAM botm		83	88	98	98	120
120	125					

## show chassis zones (PTX Series Packet Transport Routers)

**Syntax** `show chassis zones  
<detail>`

**Release Information** Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Routers.

**Description** (PTX5000 Packet Transport Router only) Display the status of the two cooling system zones of the chassis. Zone 0 consists of the Routing Engine, Control Board, SIB, PMB, and the CCG, and is cooled by the vertical fan tray. Zone 1 consists of the eight (0–7) FPCs, and their respective PICs, and is cooled by the horizontal fan trays. The vertical fan tray is located at the front of the chassis. One horizontal fan tray is located at the front top of the chassis, and another is located at the front bottom of the chassis.

**Options** **detail**—(Optional) Display status of each FRU and fan belonging to the cooling system zones.

**Required Privilege Level** view

**Related Documentation**

- [show chassis fan on page 1352](#)
- [show chassis temperature-thresholds on page 2173](#)

**List of Sample Output** [show chassis zones \(PTX5000 Packet Transport Router\) on page 2214](#)  
[show chassis zones detail \(PTX5000 Packet Transport Router\) on page 2215](#)

**Output Fields** [Table 167 on page 2214](#) lists the output fields for the **show chassis zones detail** command.

*Table 167: show chassis zones detail Output Fields*

Field Name	Field Description
<b>Item</b>	Chassis component: <ul style="list-style-type: none"> <li>• (PTX Series Packet Transport Routers)—Information about the chassis, Routing Engines, Control Boards (CBs), Switch Interface Boards (SIBs), PICs, and Flexible PIC Concentrators (FPCs).</li> </ul>
<b>Status</b>	Status of the specified item. Status can be <b>OK</b> , <b>Absent</b> , or <b>Offline</b> .
<b>Measurement</b>	Fan tray speed utilization in percentage.

## Sample Output

**show chassis zones (PTX5000 Packet Transport Router)**

```
user@host> show chassis zones
```



```

ZONE 0 Status
  Driving FRU          Routing Engine 1
  Temperature          62 degrees C / 143 degrees F
  Condition            OK
  Num Fans Missing     0
  Num Fans Failed      0
  Fan Duty Cycle       0

ZONE 1 Status
  Driving FRU          FPC 0 TL0
  Temperature          71 degrees C / 159 degrees F
  Condition            OK
  Num Fans Missing     0
  Num Fans Failed      0
  Fan Duty Cycle       0

```

### show chassis zones detail (PTX5000 Packet Transport Router)

```
user@host> show chassis zones detail
```

```

ZONE 0 Status
Item                Status          Measurement
CB 0                OK
CB 1                OK
Routing Engine 0    OK
Routing Engine 1    OK
SIB 0               OK
SIB 1               OK
SIB 2               OK
SIB 3               OK
SIB 4               OK
SIB 5               Absent
SIB 6               Absent
SIB 7               Absent
SIB 8               Absent
Fan Tray 0          OK                Spinning at 30% fan tray speed

ZONE 1 Status
Item                Status          Measurement
FPC 0               OK
FPC 1               OK
FPC 2               OK
FPC 3               OK
FPC 4               OK
FPC 5               Absent
FPC 6               Offline
FPC 7               OK
Fan Tray 1          OK                Spinning at 33% fan tray speed
Fan Tray 2          OK                Spinning at 36% fan tray speed

```

## show chassis zones

**List of Syntax**    [Syntax on page 2216](#)  
                           [Syntax \(MX Series Routers\) on page 2216](#)  
                           [Syntax \(QFX Series\) on page 2216](#)

**Syntax**    show chassis zones  
                   <detail>

**Syntax (MX Series Routers)**    show chassis zones  
   <detail>  
   <all-members>  
   <local>  
   <member *member-id*>

**Syntax (QFX Series)**    show chassis zones  
                                   <detail>  
                                   <interconnect-device *name*>

**Release Information**    Command introduced in Junos OS Release 11.3 for the QFX Series.  
                                   Command introduced in Junos OS Release 12.3 for MX2020 Universal Routing Platforms.  
                                   Command introduced in Junos OS Release 12.3 for MX2010 Universal Routing Platforms.  
                                   **all-members**, **local**, and **member *member-id*** options introduced in Junos OS Release 15.1 for MX2020 and MX2010 routers.  
                                   Command introduced in Junos OS Release 17.2 for MX2008 Universal Routing Platforms.

**Description**    (QFabric systems only) Display the status of the two cooling system zones on the Interconnect device. Zone 1 consists of eight (0 – 7) front cards, which are cooled by two fan trays. Zone 2 consists of two control boards and eight rear cards, which are cooled by eight (0 – 7) fan trays.

(MX2010, MX2020, and MX2008 routers only) Display the status of the cooling system zones of the chassis. Zone 0 consists of the Control Board, ten (0–9) FPCs, and their respective PICs, Switch Fabric Boards, and Adapter Cards. Zone 1 consists of the Routing Engine, Control Board, and Switch Processor Mezzanine Boards.

**Options**    **all-members**—(MX2010, MX2020, and MX2008 routers only) (Optional) Display the status of the cooling system zones in all members of the Virtual Chassis configuration.

**detail**—(MX2010, MX2020, and MX2008 routers only) (Optional) Display detailed status of the cooling system zones.

**detail *device-name***— (QFabric systems only) (Optional) Display detailed status of the two cooling systems on the Interconnect device.

**interconnect-device *name***— (QFabric systems only) (Optional) Display the status of the cooling zones on the Interconnect device.

**local**—(MX2010, MX2020, and MX2008 routers only) (Optional) Display the status of the cooling system zones in the local member of the Virtual Chassis.

**member *member-id***—(MX2010, MX2020, and MX2008 routers only) (Optional) Display the status of the cooling system zones in the specified member of the Virtual Chassis. Replace *member-id* with the value 0 or 1.

**Required Privilege Level** view

**Related Documentation**

- [show chassis fan on page 1352](#)
- [show chassis temperature-thresholds on page 2173](#)

**List of Sample Output**

- [show chassis zones interconnect-device \(QFabric System\) on page 2218](#)
- [show chassis zones \(MX2010 Router\) on page 2218](#)
- [show chassis zones detail \(MX2010 Router\) on page 2219](#)
- [show chassis zones \(MX2020 Router\) on page 2220](#)
- [show chassis zones detail \(MX2020 Router\) on page 2220](#)
- [show chassis zones \(MX2008 Router\) on page 2221](#)
- [show chassis zones detail \(MX2008 Router\) on page 2221](#)
- [show chassis beacon interconnect-device \(QFabric System\) on page 2222](#)
- [show chassis beacon interconnect-device fpc \(QFabric System\) on page 2222](#)
- [show chassis beacon node-device \(QFabric System\) on page 2222](#)
- [show chassis beacon node-device fpc \(QFabric System\) on page 2223](#)

**Output Fields** [Table 168 on page 2217](#) lists the output fields for the **show chassis zones** command. Output fields are listed in the approximate order in which they appear.

*Table 168: show chassis zones Output Fields*

Field Name	Field Description
Slot	FPC slot number of the device whose content is being displayed. On QFX3500 standalone switches, the number is always 0.
Beacon State	Status of the beacon state: <ul style="list-style-type: none"> <li>• Off—The beacon is <b>OFF</b>.</li> <li>• On—The beacon is <b>ON</b>.</li> </ul>
show chassis zones command output fields for MX2020, MX2010, and MX2008 routers:	
Driving FRU	Field replaceable unit (FRU).
Temperature	Temperature of the specified FRU in degrees Celsius and degrees Fahrenheit.

Table 168: show chassis zones Output Fields (continued)

Field Name	Field Description
Condition	Condition of the specified FRU. Condition can be <b>HIGH TEMP</b> , <b>WARM TEMP</b> , <b>OK</b> , and <b>Offline</b> .
Num Fans Missing	Number of fans or fan trays missing.
Num Fans Failed	Number of fans or fan trays that have failed.
Fan Duty Cycle	Fan duty cycle value.
show chassis zones detail command output fields for MX2020, MX2010, and MX2008 routers:	
Item	Chassis component: <ul style="list-style-type: none"> <li>Information about the chassis, Routing Engines, Control Boards (CBs), Switch Fabric Boards (SFBs), PICs, Flexible PIC Concentrators (FPCs), and Adapter Cards (ADCs).</li> </ul>
Measurement	Fan tray speed utilization in percentage.
Status	Status of the specified item. Status can be <b>OK</b> , <b>Absent</b> , or <b>Offline</b> .

## Sample Output

### show chassis zones interconnect-device (QFabric System)

```
user@switch> show chassis zones interconnect-device interconnect1
```

```
Slot      Beacon State
FPC       0          OFF
```

### show chassis zones (MX2010 Router)

```
user@host> show chassis zones
```

```
ZONE 0 Status
  Driving FRU           FPC 6
  Temperature           81 degrees C / 177 degrees F
  Condition             HIGH TEMP
  Num Fans Missing      0
  Num Fans Failed       0
  Fan Duty Cycle        30

ZONE 1 Status
  Driving FRU           SFB 0 Exhaust-Zone1
  Temperature           71 degrees C / 159 degrees F
  Condition             WARM TEMP
  Num Fans Missing      0
  Num Fans Failed       0
  Fan Duty Cycle        30
```

## show chassis zones detail (MX2010 Router)

user@host &gt; show chassis zones

## ZONE 0 Status

Item	Status	Measurement
CB 0	WARM TEMP	
CB 1	WARM TEMP	
FPC 0	HIGH TEMP	
FPC 1	HIGH TEMP	
FPC 2	WARM TEMP	
FPC 3	HIGH TEMP	
FPC 4	HIGH TEMP	
FPC 5	HIGH TEMP	
FPC 6	HIGH TEMP	
FPC 7	HIGH TEMP	
FPC 8	HIGH TEMP	
FPC 9	HIGH TEMP	
ADC 0	WARM TEMP	
ADC 1	WARM TEMP	
ADC 2	WARM TEMP	
ADC 3	WARM TEMP	
ADC 4	WARM TEMP	
ADC 5	WARM TEMP	
ADC 6	WARM TEMP	
ADC 7	WARM TEMP	
ADC 8	WARM TEMP	
ADC 9	WARM TEMP	
SFB 0	WARM TEMP	
SFB 1	WARM TEMP	
SFB 2	WARM TEMP	
SFB 3	Offline	
SFB 4	HIGH TEMP	
SFB 5	WARM TEMP	
SFB 6	HIGH TEMP	
SFB 7	WARM TEMP	
Fan Tray 0	OK	Spinning at 98% fan tray speed
Fan Tray 1	OK	Spinning at 98% fan tray speed

## ZONE 1 Status

Item	Status	Measurement
CB 0	WARM TEMP	
CB 1	WARM TEMP	
Routing Engine 0	OK	
Routing Engine 1	OK	
SFB 0	WARM TEMP	
SFB 1	WARM TEMP	
SFB 2	WARM TEMP	
SFB 3	Offline	
SFB 4	HIGH TEMP	
SFB 5	WARM TEMP	
SFB 6	HIGH TEMP	
SFB 7	WARM TEMP	
SPMB 0	OK	
SPMB 1	OK	
Fan Tray 2	OK	Spinning at 64% fan tray speed
Fan Tray 3	OK	Spinning at 64% fan tray speed

**show chassis zones (MX2020 Router)**

```
user@host> show chassis zones
```

```

ZONE 0 Status
  Driving FRU          FPC 0
  Temperature          31 degrees C / 87 degrees F
  Condition            OK
  Num Fans Missing     0
  Num Fans Failed      0
  Fan Duty Cycle       30

ZONE 1 Status
  Driving FRU          FPC 19
  Temperature          32 degrees C / 89 degrees F
  Condition            OK
  Num Fans Missing     0
  Num Fans Failed      0
  Fan Duty Cycle       30

```

**show chassis zones detail (MX2020 Router)**

```
user@host> show chassis zones detail
```

```

ZONE 0 Status
Item              Status      Measurement
CB 0              OK
CB 1              OK
FPC 0             OK
FPC 1             OK
FPC 2             OK
FPC 3             OK
FPC 4             OK
FPC 5             OK
FPC 6             OK
FPC 7             OK
FPC 8             OK
FPC 9             OK
ADC 0             OK
ADC 1             OK
ADC 2             OK
ADC 3             OK
ADC 4             OK
ADC 5             OK
ADC 6             OK
ADC 7             OK
ADC 8             OK
ADC 9             OK
SFB 0             OK
SFB 1             OK
SFB 2             OK
SFB 3             OK
SFB 4             OK
SFB 5             OK
SFB 6             OK
SFB 7             OK
Fan Tray 0        OK              Spinning at 38% fan tray speed
Fan Tray 1        OK              Spinning at 37% fan tray speed

ZONE 1 Status

```

Item	Status	Measurement
CB 0	OK	
CB 1	OK	
Routing Engine 0	OK	
Routing Engine 1	OK	
FPC 10	OK	
FPC 11	OK	
FPC 12	OK	
FPC 13	OK	
FPC 14	OK	
FPC 15	OK	
FPC 16	OK	
FPC 17	OK	
FPC 18	OK	
FPC 19	OK	
ADC 10	OK	
ADC 11	OK	
ADC 12	OK	
ADC 13	OK	
ADC 14	OK	
ADC 15	OK	
ADC 16	OK	
ADC 17	OK	
ADC 18	OK	
ADC 19	OK	
SFB 0	OK	
SFB 1	OK	
SFB 2	OK	
SFB 3	OK	
SFB 4	OK	
SFB 5	OK	
SFB 6	OK	
SFB 7	OK	
SPMB 0	OK	
SPMB 1	OK	
Fan Tray 2	OK	Spinning at 38% fan tray speed
Fan Tray 3	OK	Spinning at 38% fan tray speed

### show chassis zones (MX2008 Router)

```
user@host> show chassis zones
```

```

ZONE 0 Status
  Driving FRU           Routing Engine 0
  Temperature           67 degrees C / 152 degrees F
  Condition              WARM TEMP
  Num Fans Missing       0
  Num Fans Failed        0
  Fan Duty Cycle         27

```

### show chassis zones detail (MX2008 Router)

```
user@host> show chassis zones detail
```

```

ZONE 0 Status
Item           Status           Measurement
CB 0           OK
CB 1           OK

```

Routing Engine 0	OK	
Routing Engine 1	OK	
FPC 0	OK	
FPC 1	Absent	
FPC 2	Absent	
FPC 3	OK	
FPC 4	Absent	
FPC 5	OK	
FPC 6	Absent	
FPC 7	OK	
FPC 8	Absent	
FPC 9	OK	
ADC 0	OK	
ADC 1	Absent	
ADC 2	Absent	
ADC 3	OK	
ADC 4	Absent	
ADC 5	OK	
ADC 6	Absent	
ADC 7	OK	
ADC 8	Absent	
ADC 9	Absent	
SFB 0	OK	
SFB 1	OK	
SFB 2	OK	
SFB 3	OK	
SFB 4	OK	
SFB 5	OK	
SFB 6	OK	
SFB 7	OK	
SPMB 0	OK	
SPMB 1	OK	
Fan Tray 0	OK	Spinning at 60% fan tray speed
Fan Tray 1	OK	Spinning at 58% fan tray speed

#### show chassis beacon interconnect-device (QFabric System)

```
user@switch> show chassis beacon interconnect-device interconnect1
```

Chassis	OFF
CB 0	OFF
CB 1	OFF
FC 0 FPC 0	OFF
FC 1 FPC 1	OFF
RC 0 FPC 8	OFF
RC 1 FPC 9	OFF

#### show chassis beacon interconnect-device fpc (QFabric System)

```
user@switch> show chassis beacon interconnect-device interconnect1 fpc 0
```

FPC 0	ON
-------	----

#### show chassis beacon node-device (QFabric System)

```
user@switch> show chassis beacon node-device node1
```

node1	ON
-------	----



**show chassis beacon node-device fpc (QFabric System)**

```
user@switch> show chassis beacon node-device node1 fpc 0
```

```
FPC 0          ON
```

## show pfe cfep

<b>Syntax</b>	show pfe cfep
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	(M7i routers only) Display Packet Forwarding Engine Compact Forwarding Engine Board (CFEB) status and statistics information.
<b>Options</b>	This command has no options.
<b>Required Privilege Level</b>	admin
<b>List of Sample Output</b>	<a href="#">show pfe cfep on page 2225</a>
<b>Output Fields</b>	<a href="#">Table 169 on page 2224</a> lists the output fields for the <b>show pfe cfep</b> command. Output fields are listed in the approximate order in which they appear.

*Table 169: show pfe cfep Output Fields*

Field Name	Field Description
CFEB status	<p>Status of CFEB:</p> <ul style="list-style-type: none"> <li>Slot—CFEB slot number.</li> <li>State—Status of the CFEB: <ul style="list-style-type: none"> <li>Online—CFEB is online and running.</li> <li>Offline—CFEB is powered down.</li> </ul> </li> <li>Last State Change—Date and time the CFEB state last changed.</li> <li>Uptime (total)—How long the Routing Engine has been connected to the CFEB and, therefore, how long the Flexible PIC Concentrator (FPC) has been up and running.</li> <li>Failures—Number of PFE Peer detach failures.</li> <li>Pending—Number of messages waiting to be sent.</li> <li>Policer Drop Probability—Current policer drop probability. The default is high, and can be configured using the <a href="#">policer-drop-probability-low</a> statement.</li> </ul>
Peer message type receive qualifiers	<ul style="list-style-type: none"> <li>Message Type—IPC Message Type. For example, interface and nexthop.</li> <li>Receive Qualifier – Message receive qualifier for a peer (non-None only): <ul style="list-style-type: none"> <li>All</li> <li>Only this slot</li> <li>Selective slot</li> </ul> </li> </ul>

Table 169: show pfe cfeb Output Fields (continued)

Field Name	Field Description
PFE listener statistics	PFE listener statistics: <ul style="list-style-type: none"> <li>• Open—Number of times a peer was opened.</li> <li>• Close—Number of times a peer was closed.</li> <li>• Sleep—Number of times a thread slept.</li> <li>• Wakeup—Number of times wakeup was issued.</li> <li>• Resync Request—Number of resync requests.</li> <li>• Resync Done—Number of successful resyncs.</li> <li>• Resync Fail—Number of failed resyncs.</li> <li>• Resync Time—Time the resync last happened.</li> </ul>
PFE IPC statistics	<ul style="list-style-type: none"> <li>• type—IPC Message Type.</li> <li>• TX Messages—Number of Tx messages.</li> <li>• RX Messages—Number of Rx messages.</li> </ul>
PFE socket-buffer mbuf depth	<ul style="list-style-type: none"> <li>• bucket—Bucket number.</li> <li>• count—Number of messages in the bucket.</li> </ul>
PFE socket-buffer bytes pending transmit	<ul style="list-style-type: none"> <li>• bucket—Bucket number.</li> <li>• count—Number of bytes pending transmit.</li> </ul>

## Sample Output

### show pfe cfeb

```

user@host> show pfe cfeb

CFEB status:
  Slot:                Present
  State:                Online
  Last State Change:   2005-03-10 09:01:25 PST
  Uptime (total):      2d 00:44
  Failures:            0
  Pending:             0
  ..Policer Drop Probability: HIGH

Peer message type receive qualifiers:
  Message Type         Receive Qualifier
  -----
           TTP         A11
           IFD         A11
           IFL         A11
        Nexthop         A11
           COS         A11
           Route         A11
        SW Firewall     A11
        HW Firewall     A11
        PFE Statistics  A11
        PIC Statistics  A11
           Sampling     A11
        Monitoring     None

```

```

        ASP  None
        L2TP  None
        Collector  None
PIC Configuration  All
Queue Statistics  All
        (null)  None

```

## PFE listener statistics:

```

Open:          1
Close:         0
Sleep:         0
Wakeup:        0
Resync Request: 0
Resync Done:   1
Resync Fail:   0
Resync Time:   0

```

## PFE IPC statistics:

type	TX Messages	RX messages
Header	0	0
Test	0	0
Interface	562	14582
Chassis	0	0
Boot	0	0
Next-hop	104	0
Jtree	0	0
Cprod	0	0
Route	103	1
Pfe	3770	2925
Dfw	10	0
Mastership	0	0
Sampling	0	0
GUCP	0	0
CoS	50	0
GCCP	0	0
GHCP	0	0
IRSD	0	0
Monitoring	0	0
RE	0	0
PIC	0	0
ASP cfg	0	0
ASP cmd	0	0
L2TP cfg	0	0
Collector	0	0
PIC state	0	0
Aggregator	0	0
Empty	0	0

## PFE socket-buffer mbuf depth:

bucket	count
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0

8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0

PFE socket-buffer bytes pending transmit:

bucket	count
-----	-----
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0

## show pfe feb

<b>Syntax</b>	show pfe feb
<b>Release Information</b>	Command introduced before Junos OS Release 7.4.
<b>Description</b>	(M5 and M10 routers only) Display Packet Forwarding Engine Forwarding Engine Board (FEB) status and statistics information.
<b>Options</b>	This command has no options.
<b>Required Privilege Level</b>	admin
<b>List of Sample Output</b>	<a href="#">show pfe feb on page 2229</a> <a href="#">show pfe feb on page 2231</a>
<b>Output Fields</b>	Table 170 on page 2228 lists the output fields for the <b>show pfe feb</b> command. Output fields are listed in the approximate order in which they appear.

*Table 170: show pfe feb Output Fields*

Field Name	Field Description
FEB status	<p>Status of FEB:</p> <ul style="list-style-type: none"> <li>Slot—FEB slot number.</li> <li>State—State of the FEB: <ul style="list-style-type: none"> <li>Offline—FEB is powered down.</li> <li>Online—FEB is operational and running.</li> <li>Check—FEB is in alarmed state where the Switch Interface Board (SIB) plane is partially operational for the following reasons: <ul style="list-style-type: none"> <li>FEB is not inserted properly.</li> <li>Two or more links between the FEB and Packet Forwarding Engine fail.</li> </ul> </li> <li>Last State Change—Date and time the CFEB state last changed.</li> <li>Uptime (total)—How long the Routing Engine has been connected to the FEB and, therefore, how long the Flexible PIC Concentrator (FPC) has been up and running.</li> <li>Failures—Number of PFE Peer detach failures.</li> <li>Pending—Number of messages waiting to be sent.</li> <li>Policer Drop Probability—Current policer drop probability. The default is high, and can be configured using the <a href="#">policer-drop-probability-low</a> statement.</li> </ul> </li> </ul>
Peer message type receive qualifiers	<ul style="list-style-type: none"> <li>Message Type—IPC Message Type. For example, interface and nexthop.</li> <li>Receive Qualifier – Message receive qualifier for a peer (non-None only): <ul style="list-style-type: none"> <li>All</li> <li>Only this slot</li> <li>Selective slot</li> </ul> </li> </ul>

Table 170: show pfe feb Output Fields (continued)

Field Name	Field Description
PFE listener statistics	PFE listener statistics: <ul style="list-style-type: none"> <li>• Open—Number of times a peer was opened.</li> <li>• Close—Number of times a peer was closed.</li> <li>• Sleep—Number of times a thread slept.</li> <li>• Wakeup—Number of times wakeup was issued.</li> <li>• Resync Request—Number of resync requests.</li> <li>• Resync Done—Number of successful resyncs.</li> <li>• Resync Fail—Number of failed resyncs.</li> <li>• Resync Time—Time the resync last happened.</li> </ul>
PFE IPC statistics	<ul style="list-style-type: none"> <li>• type—IPC Message Type.</li> <li>• TX Messages—Number of Tx messages.</li> <li>• RX Messages—Number of Rx messages.</li> </ul>
PFE socket-buffer mbuf depth	<ul style="list-style-type: none"> <li>• bucket—Bucket number.</li> <li>• count—Number of messages in the bucket.</li> </ul>
PFE socket-buffer bytes pending transmit	<ul style="list-style-type: none"> <li>• bucket—Bucket number.</li> <li>• count—Number of bytes pending transmit.</li> </ul>

## Sample Output

### show pfe feb

```

user@host> show pfe feb

FEB status:
  Slot:                Present
  State:                Online
  Last State Change:   2005-03-11 00:33:57 PST
  Uptime (total):      1d 09:14
  Failures:            0
  Pending:              0
  ..Policer Drop Probability: HIGH

Peer message type receive qualifiers:
  Message Type         Receive Qualifier
  -----
                TTP    A11
                IFD    A11
                IFL    A11
                Nexthop A11
                COS    A11
                Route   A11
                SW Firewall A11
                HW Firewall A11
                PFE Statistics A11
                PIC Statistics A11
                Sampling  A11
                Monitoring None

```

```

        ASP  None
        L2TP  None
        Collector  None
PIC Configuration  All
Queue Statistics  All
        (null)  None

```

## PFE listener statistics:

```

Open:          1
Close:         0
Sleep:         0
Wakeup:        0
Resync Request: 0
Resync Done:   1
Resync Fail:   0
Resync Time:   0

```

## PFE IPC statistics:

type	TX Messages	RX messages
-----	-----	-----
Header	0	0
Test	0	0
Interface	639	11889
Chassis	0	0
Boot	0	0
Next-hop	104	0
Jtree	0	0
Cprod	0	0
Route	940	0
Pfe	3008	1995
Dfw	9	0
Mastership	0	0
Sampling	0	0
GUCP	0	0
CoS	35	0
GCCP	0	0
GHCP	0	0
IRSD	0	0
Monitoring	0	0
RE	0	0
PIC	0	0
ASP cfg	0	0
ASP cmd	0	0
L2TP cfg	0	0
Collector	0	0
PIC state	0	0
Aggregator	0	0
Empty	0	0

## PFE socket-buffer mbuf depth:

bucket	count
-----	-----
0	0
1	0
2	0
3	0
4	0
5	0
6	0



7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0

PFE socket-buffer bytes pending transmit:

bucket	count
-----	-----
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0

### show pfe feb

user@host> show pfe feb

FEB status:

Slot:	Present
State:	Online
Last State Change:	2005-03-11 00:33:57 PST
Uptime (total):	1d 09:14
Failures:	0
Pending:	0

Peer message type receive qualifiers:

Message Type	Receive Qualifier
-----	-----
TTP	All
IFD	All
IFL	All

```

Nexthop All
COS All
Route All
SW Firewall All
HW Firewall All
PFE Statistics All
PIC Statistics All
Sampling All
Monitoring None
ASP None
L2TP None
Collector None
PIC Configuration All
Queue Statistics All
(null) None

```

## PFE listener statistics:

```

Open: 1
Close: 0
Sleep: 0
Wakeup: 0
Resync Request: 0
Resync Done: 1
Resync Fail: 0
Resync Time: 0

```

## PFE IPC statistics:

type	TX Messages	RX messages
Header	0	0
Test	0	0
Interface	639	11889
Chassis	0	0
Boot	0	0
Next-hop	104	0
Jtree	0	0
Cprod	0	0
Route	940	0
Pfe	3008	1995
Dfw	9	0
Mastership	0	0
Sampling	0	0
GUCP	0	0
CoS	35	0
GCCP	0	0
GHCP	0	0
IRSD	0	0
Monitoring	0	0
RE	0	0
PIC	0	0
ASP cfg	0	0
ASP cmd	0	0
L2TP cfg	0	0
Collector	0	0
PIC state	0	0
Aggregator	0	0
Empty	0	0

PFE socket-buffer mbuf depth:

bucket	count
-----	-----
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0

PFE socket-buffer bytes pending transmit:

bucket	count
-----	-----
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0

## show pfe fpc

---

**List of Syntax**    [Syntax on page 2234](#)  
                          [Syntax \(TX Matrix and TX Matrix Plus Router\) on page 2234](#)  
                          [Syntax \(MX Series Router\) on page 2234](#)

**Syntax**    `show pfe fpc slot`  
                  `<detail | extensive>`

**Syntax (TX Matrix and TX Matrix Plus Router)**    `show pfe fpc`  
  `<lcc number>`

**Syntax (MX Series Router)**    `show pfe fpc slot`  
  `<detail | extensive>`  
  `<all-members>`  
  `<local>`  
  `<member member-id>`

**Release Information**    Command introduced before Junos OS Release 7.4.

**Description**    Display Packet Forwarding Engine statistics for the specified Flexible PIC Concentrator (FPC).

**Options**    **slot**—FPC slot number. Replace **slot** with a value from 0 through 2.

**detail | extensive**—(Optional) Display the specified level of detail.

**all-members**—(MX Series routers only) (Optional) Display Packet Forwarding Engine statistics for the specified FPC in all members of the Virtual Chassis configuration.

**lcc number**—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, the slot number of the T640 router (or line-card chassis) that houses the FPC. On a TX Matrix Plus router, **lcc number** represents the slot number of the router (or line-card chassis) that houses the FPC.

                  Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

**local**—(MX Series routers only) (Optional) Display Packet Forwarding Engine statistics for the specified FPC in the local Virtual Chassis member.

**member *member-id***—(MX Series routers only) (Optional) Display Packet Forwarding Engine statistics for the specified FPC in the specified member of the Virtual Chassis configuration. Replace *member-id* with a value of 0 or 1.

**Required Privilege Level** admin

**List of Sample Output** [show pfe fpc on page 2237](#)  
[show pfe fpc lcc on page 2238](#)  
[show pfe fpc 0 detail on page 2240](#)  
[show pfe fpc 0 \(MX 960 with DPC\) on page 2243](#)

**Output Fields** [Table 171 on page 2235](#) lists the output fields for the **show pfe fpc** command. Output fields are listed in the approximate order in which they appear.

*Table 171: show pfe fpc Output Fields*

Field Name	Field Description
FPC 1 status	<p>Status of FPC 1:</p> <ul style="list-style-type: none"> <li>Slot—FPC slot number – 1.</li> <li>State—State of FPC1: <ul style="list-style-type: none"> <li>Dead—Held in reset because of errors.</li> <li>Diag—Slot is being ignored while the FPC is running diagnostics.</li> <li>Dormant—Held in reset.</li> <li>Empty—No FPC is present.</li> <li>Online—FPC is online and running.</li> <li>Present—FPC is detected by the chassis daemon but either is not supported by the current version of Junos OS or is inserted in the wrong slot. The output also states either Hardware Not Supported or Hardware Not in Right Slot. The FPC is coming up but not yet online.</li> <li>Probed—Probe is complete; awaiting restart of the Packet Forwarding Engine (PFE).</li> <li>Probe-wait—Waiting to be probed.</li> </ul> </li> <li>Last State Change—Date and time the FPC state last changed.</li> <li>Uptime—How long the Routing Engine has been connected to the FEB and, therefore, how long the Flexible PIC Concentrator (FPC) has been up and running.</li> <li>Failures—Number of PFE Peer detach failures.</li> <li>Pending—Number of messages waiting to be sent.</li> <li>Route Memory Enhanced—Reallocation of the jtree memory on the Packet Forwarding Engine to allocate more memory for routing tables. Can be configured with the <a href="#">memory-enhanced</a> statement.</li> </ul>

Table 171: show pfe fpc Output Fields (continued)

Field Name	Field Description
PFE listener statistics	PFE listener statistics: <ul style="list-style-type: none"> <li>• Open—Number of times a peer was opened.</li> <li>• Close—Number of times a peer was closed.</li> <li>• Sleep—Number of times a thread slept.</li> <li>• Wakeup—Number of times wakeup was issued.</li> <li>• Resync Request—Number of resync requests.</li> <li>• Resync Done—Number of successful resyncs.</li> <li>• Resync Fail—Number of failed resyncs.</li> <li>• Resync Time—Time the resync last happened.</li> </ul>
PFE IPC statistics	<ul style="list-style-type: none"> <li>• type—IPC Message Type.</li> <li>• TX Messages—Number of Tx messages.</li> <li>• RX Messages—Number of Rx messages.</li> </ul>
GFPC 0 status	Status of GFPC 0: <ul style="list-style-type: none"> <li>• Slot—GFPC slot number – 0.</li> <li>• State—State of GFPC.</li> <li>• Last State Change—Date and time the GFPC state last changed.</li> </ul>
Peer message type receive qualifiers [ non-NONE(s) only ]	<ul style="list-style-type: none"> <li>• IPC Msg Type—IPC Message Type. For example, interface, nexthop.</li> <li>• Receive Qualifier—Message receive qualifier for a peer (non-NONE(s) only):</li> </ul>
IFSTATE BITS SET	IFSTATE clients that have registered to receive the message types this slot is listening to.
PFE listener statistics	PFE listener statistics: <ul style="list-style-type: none"> <li>• Open—Number of times a peer was opened.</li> <li>• Close—Number of times a peer was closed.</li> <li>• Sleep—Number of times a thread slept.</li> <li>• Wakeup—Number of times wakeup was issued.</li> <li>• Resync Request—Number of resync requests.</li> <li>• Resync Done—Number of successful resyncs.</li> <li>• Resync Fail—Number of failed resyncs.</li> <li>• Resync Time—Time the resync last happened.</li> </ul>
PFE IPC statistics	<ul style="list-style-type: none"> <li>• type—IPC Message Type.</li> <li>• TX Messages—Number of Tx messages.</li> <li>• RX Messages—Number of Rx messages.</li> </ul>
PFE socket-buffer mbuf depth	<ul style="list-style-type: none"> <li>• bucket—Bucket number.</li> <li>• count—Number of messages in the bucket.</li> </ul>
PFE socket-buffer bytes pending transmit	<ul style="list-style-type: none"> <li>• bucket—Bucket number.</li> <li>• count—Number of bytes pending transmit.</li> </ul>

Table 171: show pfe fpc Output Fields (continued)

Field Name	Field Description
GFPC 2 status	<p>Status of GFPC 2:</p> <ul style="list-style-type: none"> <li>Slot—GFPC slot number – 2.</li> <li>State—State of GFPC.</li> <li>Last State Change—Date and time the GFPC state last changed.</li> <li>Route Memory Enhanced—Reallocation of the jtree memory on the Packet Forwarding Engine to allocate more memory for routing tables. Can be configured with the <a href="#">memory-enhanced</a> statement.</li> <li>Filter Memory Enhanced—Reallocation of the jtree memory on the Packet Forwarding Engine to allocate more memory for firewall filters. Can be configured with the <a href="#">memory-enhanced</a> statement.</li> </ul>
XDPC status	<p>XDPC status:</p> <ul style="list-style-type: none"> <li>Slot—Present or empty.</li> <li>State—Online or offline.</li> <li>Last State Change—Date and time the DPC state last changed.</li> <li>Uptime (total)—Length of time the DPC has been online.</li> <li>Failures—Number of DPC failures.</li> <li>Pending—Number of messages waiting to be sent.</li> <li>Route Memory Enhanced—Reallocation of the jtree memory on the Packet Forwarding Engine to allocate more memory for routing tables. Can be configured with the <a href="#">memory-enhanced</a> statement.</li> <li>Policer Drop Probability—Current policer drop probability. The default is high, and can be configured using the <a href="#">policer-drop-probability-low</a> statement.</li> </ul>

## Sample Output

### show pfe fpc

```

user@host> show pfe fpc 1

FPC 1 status:
  Slot:           Present
  State:          Online
  Last State Change: 2000-01-10 18:12:27 UTC
  Uptime:         1d 03:31
  Failures:       0
  Pending:        0
  Route Memory Enhanced: 0
PFE listener statistics:
  Open:           1
  Close:          0
  Sleep:          0
  Wakeup:         0
  Resync Request: 0
  Resync Done:    0
  Resync Fail:    0
  Resync Time:    0

PFE IPC statistics:
  type           TX Messages  RX messages

```

Header	0	0
Test	0	0
Interface	2251	2219
Chassis	0	0
Boot	0	0
Next-hop	0	0
Jtree	0	0
Cprod	0	0
Route	0	0
Pfe	0	1
Dfw		

### show pfe fpc lcc

```
user@host> show pfe fpc 0 lcc 0
```

```
lcc0-re0:
```

```
GFPC 0 status:
```

```
Slot:          Present
State:          Online
Last State Change: 2009-06-17 21:00:35 PDT
Uptime (total):  02:31:45
Failures:        0
Pending:         0
```

```
Peer message type receive qualifiers [ non-NONE(s) only ]:
```

IPC Msg Type (subtype)	Receive Qualifier
Interface (0)	All
Interface (1)	All
Interface (2)	All
Interface (3)	All
Interface (4)	All
Interface (5)	All
Interface (6)	All
Interface (7)	All
Interface (8)	All
Interface (9)	All
Interface (10)	All
Interface (11)	All
Interface (12)	All
Interface (13)	All
Interface (14)	All
Interface (15)	All
Interface (16)	All
Interface (17)	All
Interface (18)	All
Interface (19)	All
Interface (20)	Slot only
Interface (21)	All
...	
Next-hop (0)	All
Next-hop (1)	All
Next-hop (2)	All
Next-hop (3)	All
Next-hop (4)	All
Next-hop (5)	Always TRUE
...	



```

Route          (0)      All
Route          (1)      All
Route          (2)      All
Route          (3)      All
Route          (4)      All
Route          (5)      All
Route          (6)      All
Route          (7)      All
Route          (8)      All

...
Pfe            (1)      Always TRUE
Pfe            (3)      Always TRUE
Pfe            (5)      Always TRUE

...
Dfw            (0)      All
Dfw            (1)      All
Dfw            (2)      All
Dfw            (3)      All

...
Sampling       (1)      All
Sampling       (2)      All
Sampling       (3)      All
CoS            (0)      All
CoS            (1)      All
CoS            (2)      All
CoS            (3)      All

...
PIC            (1)      Always TRUE
PIC            (3)      Always TRUE

...
GenCfg         (8)      All
GenCfg         (15)     All

...
IFSTATE BITS SET:
-----
IFD
IFL
IFF
IFA
RTTABLE
ROUTE
NEXTHOP
FIREWALL
NAME TABLE
COS_FABRIC
COS_POLICY
COS_RED
COS_REWRT_TABLE
COS_REWRT_IFLMAP
COS_CLASS_TABLE
COS_CLASS_IFLMAP
COS_POLICER
COS_SHAPER
SAMPLE
RTCOS
SYSCONF
IFVP
SADB

```

```

IFVC
COS_FC_QUEUE
COS_FRAGMAP_TABLE
COS_FRAGMAP_IFLMAP
Generic config
Mesh group

PFE listener statistics:
Open:          1
Close:         0
Sleep:         0
Wakeup:        0
Resync Request: 0
Resync Done:   1
Resync Fail:   0
Resync Time:   0

PFE IPC statistics:
Type (subtype)      TX Messages    RX messages
-----
Interface ( 3)      165             0
Interface ( 4)       81             0
Interface ( 5)        0            190
Interface ( 8)      145             0
Interface ( 9)      425             0
Interface (10)       24             0
...

PFE socket-buffer mbuf depth:
bucket      count
-----
0           0
1           0
2           0

PFE socket-buffer bytes pending transmit:
bucket      count
-----
0           0
1           0
...

```

### show pfe fpc 0 detail

```

user@host> show pfe fpc 0 detail

GFPC 2 status:
Slot:          Present
State:         Online
Last State Change: 2010-11-16 03:55:25 PST
Uptime (total): 00:11:06
Failures:      1
Pending:       0
Route Memory Enhanced: 0
Filter Memory Enhanced: 1

Peer message type receive qualifiers [ non-NONE(s) only ]:
IPC Msg Type (subtype)      Receive Qualifier
-----
Interface (0)              All

```

```

Interface      (1)      All
Interface      (2)      All
Interface      (3)      All
Interface      (4)      All
Interface      (5)      All
Interface      (6)      All
Interface      (7)      All
Interface      (8)      All
Interface      (9)      All
Interface      (10)     All
Interface      (11)     All
...
Next-hop       (0)      All
Next-hop       (1)      All
Next-hop       (2)      All
Next-hop       (3)      All
Next-hop       (4)      All
Next-hop       (5)      All
...
Route          (0)      All
Route          (1)      All
Route          (2)      All
Route          (3)      All
Route          (4)      All
Route          (5)      All
...
Pfe            (1)      Always TRUE
Pfe            (3)      Always TRUE
Pfe            (5)      Always TRUE
...
Dfw            (0)      All
Dfw            (1)      All
Dfw            (2)      All
Dfw            (3)      All
...
Sampling       (1)      All
Sampling       (2)      All
Sampling       (3)      All
CoS            (0)      All
CoS            (1)      All
CoS            (2)      All
CoS            (3)      All
CoS            (4)      All
...
PIC            (1)      Always TRUE
PIC            (3)      Always TRUE
...
GenCfg         (8)      All
GenCfg         (15)     All
...
IFSTATE BITS SET:
-----
      IFD
      IFL
      IFF
      IFA
      RTTABLE
      ROUTE
      NEXTHOP
      FIREWALL

```

```

NAME TABLE
COS_FABRIC
COS_POLICY
COS_RED
COS_REWRT_TABLE
COS_REWRT_IFLMAP
COS_CLASS_TABLE
COS_CLASS_IFLMAP
COS_POLICER
COS_SHAPER
SAMPLE
RTCOS
SYSCONF
IFVP
SADB
IFVC
COS_FC_QUEUE
COS_FRAGMAP_TABLE
COS_FRAGMAP_IFLMAP
Generic config
Mesh group

```

## PFE listener statistics:

```

Open:          2
Close:         1
Sleep:         0
Wakeup:        0
Resync Request: 0
Resync Done:   2
Resync Fail:   0
Resync Time:   0

```

## PFE IPC statistics:

Type (subtype)	TX Messages	RX messages
-----	-----	-----
Interface ( 3)	104	0
Interface ( 5)	0	8
Interface ( 8)	85	0
Interface ( 9)	67	0
Interface (10)	4	0
...		
Next-hop ( 1)	364	0
Next-hop ( 3)	12	0
Next-hop (11)	33	0
Next-hop (23)	39	0
Route ( 1)	331	0
Route ( 2)	34	0
Route ( 3)	1	0
Route ( 6)	1	0
Route ( 9)	48	0
Pfe ( 1)	0	1
Pfe ( 3)	1	0
Pfe ( 4)	0	1
Pfe ( 5)	1	0
...		
Dfw ( 1)	20	0
Dfw (18)	1	0
GenCfg ( 8)	45	0
GenCfg (15)	1	0

## show pfe fpc 0 (MX 960 with DPC)

user@host&gt; show pfe fpc 0

XDPC 0 status:

```

Slot:           Present
State:          Online
Last State Change: 2012-08-07 13:13:01 PDT
Uptime (total):  21:01:41
Failures:       0
Pending:        0
Route Memory Enhanced: 0
Policer Drop Probability: HIGH

```

Peer message type receive qualifiers [ non-NONE(s) only ]:

IPC Msg Type (subtype)	Receive Qualifier
Interface (0)	All
Interface (1)	All
Interface (2)	All
Interface (3)	All
Interface (4)	All
Interface (5)	All
Interface (6)	All
Interface (7)	All
Interface (8)	All
Interface (9)	All
Interface (10)	All
Interface (11)	All
Interface (12)	All
Interface (13)	All
Interface (14)	All
Interface (15)	All
Interface (16)	All
Interface (17)	All
Interface (18)	All
Interface (19)	All
Interface (20)	Slot only
Interface (21)	All
Interface (22)	Slot only
Interface (23)	All
Interface (24)	All
Interface (25)	All
Interface (26)	All
Interface (27)	All
Interface (28)	All
Interface (29)	All
Interface (30)	All
Interface (31)	All
Interface (32)	All
Interface (33)	All
Interface (34)	All
Interface (35)	All
Interface (36)	All
Interface (37)	All
Interface (38)	All
Interface (39)	All
Interface (40)	All
Interface (41)	All
Interface (42)	Slot only

Interface	(0)	All
Interface	(1)	All
Interface	(2)	All
Interface	(3)	All
Interface	(4)	All
Interface	(5)	All
Interface	(6)	All
Interface	(7)	All
Interface	(8)	All
Interface	(9)	All
Interface	(10)	All
Interface	(11)	All
Interface	(12)	All
Interface	(13)	All
Interface	(14)	All
Interface	(15)	All
Interface	(16)	All
Interface	(17)	All
Interface	(18)	All
Interface	(19)	All
Interface	(20)	Slot only
Interface	(21)	All
Interface	(22)	Slot only
Interface	(23)	All
Interface	(24)	All
Interface	(25)	All
Interface	(26)	All
Interface	(27)	All
Interface	(28)	All
Interface	(29)	All
Interface	(30)	All
Interface	(31)	All
Interface	(32)	All
Interface	(33)	All
Interface	(34)	All
Interface	(35)	All
Interface	(36)	All
Interface	(37)	All
Interface	(38)	All
Interface	(39)	All
Interface	(40)	All
Interface	(41)	All
Interface	(42)	Slot only

Interface	(43)	Slot only
Interface	(44)	Slot only
Interface	(45)	All
Interface	(46)	All
Interface	(47)	All
Interface	(48)	Slot only
Interface	(49)	Slot only
Interface	(50)	Slot only
Interface	(51)	Slot only
Interface	(52)	All
Interface	(53)	All
Interface	(54)	All
Interface	(55)	All
Interface	(56)	Slot only
Interface	(57)	All
Interface	(58)	All
Interface	(59)	All
Interface	(60)	All
Interface	(61)	All
Interface	(62)	All
Interface	(63)	All
Interface	(64)	Slot only
Interface	(65)	All
Interface	(66)	All
Interface	(67)	All
Interface	(68)	All
Interface	(69)	All
Interface	(70)	All
Interface	(71)	All
Interface	(72)	All
Interface	(73)	All
Interface	(74)	All
Interface	(75)	All
Interface	(76)	Slot only
Interface	(77)	Slot only
Interface	(78)	Slot only
Interface	(79)	All
Interface	(80)	All
Interface	(81)	All
Interface	(82)	All
Interface	(83)	Slot only
Interface	(84)	All
Interface	(85)	All
Interface	(86)	All
Interface	(87)	All
Interface	(88)	All
Interface	(89)	All
Interface	(90)	All
Interface	(91)	All
Interface	(92)	All
Interface	(93)	Slot only
Interface	(94)	Slot only
Interface	(95)	Slot only
Interface	(96)	All
Interface	(97)	All
Interface	(98)	All
Interface	(99)	All
Interface	(100)	All
Interface	(101)	All
Interface	(102)	All

Interface	(103)	All
Interface	(104)	All
Interface	(105)	Slot only
Interface	(106)	Slot only
Interface	(107)	All
Interface	(108)	All
Interface	(109)	All
Interface	(110)	All
Interface	(111)	All
Interface	(112)	All
Interface	(113)	All
Interface	(114)	All
Interface	(115)	All
Interface	(116)	All
Interface	(117)	All
Interface	(118)	All
Interface	(119)	All
Interface	(120)	All
Interface	(121)	Slot only
Interface	(122)	All
Interface	(123)	All
Interface	(124)	All
Interface	(125)	Slot only
Interface	(126)	Slot only
Interface	(127)	Slot only
Interface	(128)	All
Interface	(129)	All
Interface	(130)	All
Interface	(131)	All
Interface	(132)	All
Interface	(133)	All
Interface	(134)	All
Interface	(135)	All
Interface	(138)	All
Interface	(139)	All
Interface	(142)	All
Interface	(145)	All
Interface	(146)	All
Interface	(147)	All
Interface	(148)	All
Interface	(149)	All
Interface	(150)	Slot only
Interface	(151)	All
Interface	(152)	Slot only
Interface	(153)	All
Interface	(154)	All
Interface	(155)	All
Interface	(156)	All
Interface	(157)	All
Interface	(158)	All
Interface	(159)	Slot only
Interface	(160)	All
Interface	(161)	All
Interface	(163)	All
Interface	(164)	Slot only
Interface	(165)	Slot only
Interface	(167)	All
Interface	(168)	All
Interface	(169)	All
Interface	(170)	Slot only

Interface	(171)	Slot only
Interface	(172)	A11
Interface	(173)	A11
Interface	(174)	A11
Interface	(175)	A11
Interface	(176)	A11
Interface	(177)	A11
Interface	(178)	A11
Interface	(179)	A11
Interface	(180)	A11
Interface	(181)	A11
Interface	(182)	A11
Interface	(183)	A11
Interface	(184)	A11
Interface	(185)	A11
Interface	(186)	A11
Interface	(187)	A11
Interface	(188)	A11
Interface	(189)	A11
Interface	(190)	A11
Interface	(191)	A11
Interface	(192)	A11
Interface	(193)	A11
Interface	(194)	A11
Interface	(195)	A11
Interface	(196)	A11
Interface	(197)	A11
Interface	(198)	A11
Interface	(199)	A11
Interface	(200)	A11
Interface	(201)	A11
Interface	(202)	A11
Interface	(204)	A11
Interface	(205)	A11
Interface	(206)	A11
Interface	(207)	A11
Interface	(208)	A11
Interface	(209)	A11
Interface	(210)	A11
Interface	(211)	A11
Interface	(212)	A11
Interface	(213)	A11
Interface	(214)	A11
Interface	(215)	A11
Interface	(216)	A11
Interface	(217)	A11
Interface	(218)	A11
Interface	(219)	A11
Interface	(220)	A11
Interface	(221)	A11
Interface	(222)	A11
Interface	(223)	A11
Interface	(224)	A11
Interface	(225)	A11
Interface	(226)	A11
Interface	(227)	A11
Interface	(229)	A11
Interface	(230)	A11
Interface	(231)	A11
Interface	(232)	A11



Interface	(233)	All
Interface	(234)	All
Interface	(235)	All
Interface	(236)	All
Interface	(237)	All
Interface	(238)	All
Interface	(239)	All
Next-hop	(0)	All
Next-hop	(1)	All
Next-hop	(2)	All
Next-hop	(3)	All
Next-hop	(4)	All
Next-hop	(5)	All
Next-hop	(6)	All
Next-hop	(7)	All
Next-hop	(8)	All
Next-hop	(9)	All
Next-hop	(10)	All
Next-hop	(11)	All
Next-hop	(12)	All
Next-hop	(13)	All
Next-hop	(14)	All
Next-hop	(15)	All
Next-hop	(16)	All
Next-hop	(17)	All
Next-hop	(18)	All
Next-hop	(19)	All
Next-hop	(20)	All
Next-hop	(21)	All
Next-hop	(22)	All
Next-hop	(23)	All
Next-hop	(24)	All
Next-hop	(25)	All
Next-hop	(26)	All
Next-hop	(27)	All
Next-hop	(28)	All
Next-hop	(29)	All
Next-hop	(30)	All
Next-hop	(31)	All
Next-hop	(32)	All
Next-hop	(33)	All
Next-hop	(34)	All
Next-hop	(35)	All
Next-hop	(36)	All
Next-hop	(37)	All
Next-hop	(39)	Always TRUE
Next-hop	(40)	All
Next-hop	(41)	All
Next-hop	(42)	All
Next-hop	(43)	All
Route	(0)	All
Route	(1)	All
Route	(2)	All
Route	(3)	All
Route	(4)	All
Route	(5)	All
Route	(6)	All
Route	(7)	All
Route	(8)	All
Route	(9)	All

Route	(10)	All
Route	(11)	All
Route	(12)	All
Route	(13)	All
Route	(14)	All
Route	(15)	All
Route	(16)	All
Route	(17)	All
Route	(18)	All
Route	(19)	All
Route	(20)	All
Route	(22)	All
Route	(23)	All
Route	(24)	All
Route	(25)	All
Route	(26)	All
Route	(27)	All
Route	(28)	All
Route	(29)	Always TRUE
Route	(30)	Always TRUE
Pfe	(1)	Always TRUE
Pfe	(3)	Always TRUE
Pfe	(5)	Always TRUE
Pfe	(7)	Always TRUE
Pfe	(10)	Always TRUE
Pfe	(11)	Always TRUE
Pfe	(12)	Always TRUE
Pfe	(13)	Always TRUE
Pfe	(14)	Always TRUE
Pfe	(15)	Always TRUE
Pfe	(35)	Always TRUE
Dfw	(0)	All
Dfw	(1)	All
Dfw	(2)	All
Dfw	(3)	All
Dfw	(4)	All
Dfw	(5)	All
Dfw	(6)	All
Dfw	(7)	All
Dfw	(8)	All
Dfw	(9)	All
Dfw	(10)	All
Dfw	(11)	All
Dfw	(12)	All
Dfw	(13)	All
Dfw	(14)	All
Dfw	(18)	All
Dfw	(19)	All
Sampling	(1)	All
Sampling	(2)	All
Sampling	(3)	All
CoS	(0)	All
CoS	(1)	All
CoS	(2)	All
CoS	(3)	All
CoS	(4)	All
CoS	(5)	All
CoS	(6)	All
CoS	(7)	All
CoS	(8)	All

```

CoS          (9)          All
CoS          (10)         All
CoS          (11)         All
CoS          (12)         All
CoS          (13)         All
CoS          (14)         All
CoS          (15)         All
CoS          (16)         All
CoS          (17)         All
CoS          (18)         All
CoS          (19)         All
CoS          (20)         All
CoS          (21)         All
CoS          (22)         All
CoS          (23)         All
CoS          (27)         All
CoS          (29)         All
CoS          (31)         All
CoS          (32)         All
PIC          (1)          Always TRUE
PIC          (3)          Always TRUE
PIC          (5)          Always TRUE
PIC          (7)          Always TRUE
PIC          (10)         Always TRUE
PIC          (11)         Always TRUE
PIC          (12)         Always TRUE
PIC          (13)         Always TRUE
PIC          (14)         Always TRUE
PIC          (15)         Always TRUE
GenCfg       (2)          All
GenCfg       (4)          All
GenCfg       (5)          All
GenCfg       (6)          All
GenCfg       (8)          All
GenCfg       (9)          All
GenCfg       (10)         All
GenCfg       (15)         All
GenCfg       (17)         All
GenCfg       (24)         All
GenCfg       (27)         All
GenCfg       (29)         All
GenCfg       (31)         All
STP          (1)          All
BD           (0)          All
BD           (1)          All
BD           (2)          All

```

IFSTATE BITS SET:

```

-----
IFD
IFL
IFF
IFA
RTTABLE
ROUTE
NEXTHOP
FIREWALL
NAME TABLE
COS_FABRIC
COS_POLICY
COS_RED

```

```

COS_REWRT_TABLE
COS_REWRT_IFLMAP
COS_CLASS_TABLE
COS_CLASS_IFLMAP
COS_POLICER
COS_SHAPER
SAMPLE
RTCOS
SYSCONF
IFVP
SADB
IFVC
COS_FC_QUEUE
COS_FRAGMAP_TABLE
COS_FRAGMAP_IFLMAP
Generic config
STP
Mesh group
Bridge Domain
IFBD

```

## PFE listener statistics:

```

Open:          1
Close:         0
Sleep:         0
Wakeup:        0
Resync Request: 0
Resync Done:   1
Resync Fail:   0
Resync Time:   0

```

## PFE IPC statistics:

Type (subtype)	TX Messages	RX messages
-----	-----	-----
Interface ( 3)	131	0
Interface ( 5)	0	379
Interface ( 9)	48	0
Interface (10)	102	0
Interface (11)	1	0
Interface (12)	204	0
Interface (13)	177	0
Interface (15)	90	0
Interface (23)	49	0
Interface (24)	8	0
Interface (29)	27	0
Interface (30)	11	0
Interface (33)	101	0
Interface (34)	101	0
Interface (35)	84	0
Interface (36)	18	0
Interface (37)	38	0
Interface (39)	0	1
Interface (53)	0	379
Interface (54)	620	0
Interface (55)	2064	0
Interface (56)	0	379
Interface (57)	57	0
Interface (58)	1	0
Interface (90)	0	21
Interface (91)	0	13

Interface	(92)	0	12
Interface	(117)	0	1516
Interface	(138)	0	758
Interface	(151)	244	0
Interface	(163)	124	0
Interface	(201)	101	0
Interface	(226)	91	0
Interface	(229)	124	0
Interface	(238)	205	0
Next-hop	( 1)	159	0
Next-hop	( 2)	5	0
Next-hop	( 3)	16	0
Next-hop	(11)	51	0
Next-hop	(23)	12	0
Next-hop	(40)	3	0
Route	( 1)	164	0
Route	( 2)	70	0
Route	( 3)	11	0
Route	( 6)	1	0
Route	( 9)	14	0
Route	(12)	2	0
Route	(13)	1	0
Route	(22)	4	0
Pfe	( 1)	0	1
Pfe	( 3)	157	0
Pfe	( 4)	0	157
Pfe	( 5)	158	0
Pfe	( 6)	0	158
Pfe	( 7)	158	0
Pfe	( 8)	0	158
Pfe	( 9)	0	1
Pfe	(10)	1	0
Pfe	(11)	1	0
Pfe	(12)	2772	0
Pfe	(13)	108	108
Pfe	(15)	158	0
Pfe	(16)	0	158
Pfe	(47)	0	1
Dfw	( 1)	23	0
Dfw	( 2)	1	0
Dfw	( 6)	0	6
Dfw	(18)	175	0
GenCfg	( 5)	1	0
GenCfg	( 8)	157	0
GenCfg	( 9)	21	0
GenCfg	(15)	57	0
STP	( 1)	112	0
STP	( 2)	0	98
STP	( 5)	0	97

## show fib-local-accounting ip

---

**Syntax**      `show fib-local-accounting ip`

**Release Information**    Command introduced in Junos OS Release 12.3 for MX Series routers.

**Description**          Display the number of packets that were sent to an anchor MPC due to FIB localization.

**Required Privilege Level**    view

**Related Documentation**

- [fib-remote on page 389](#)
- [fib-local on page 388](#)
- [Example: Configuring Packet Forwarding Engine FIB Localization on page 383](#)

## Sample Output

### show fib-local-accounting ip

```
user@host> show fib-local-accounting ip
```

```
PFE 0
  fe_addr      packets      bytes
  28           0           0
  29           0           0
  30           0           0
  31           0           0
PFE 1
  fe_addr      packets      bytes
  28           0           0
  29           0           0
  30           0           0
  31           0           0
```

## show ptp aggregated-ethernet interfaces

<b>Syntax</b>	<code>show ptp aggregated-ethernet interfaces</code>
<b>Release Information</b>	Command introduced in Junos OS Release 17.2R1.
<b>Description</b>	Display the information related to aggregated Ethernet bundles.
<b>Options</b>	This command has no options.
<b>Required Privilege Level</b>	View
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Precision Time Protocol Overview on page 256</a></li> </ul>
<b>Output Fields</b>	<a href="#">Table 172 on page 2253</a> lists the output fields for the <code>show ptp aggregated-ethernet interfaces</code> command. Output fields are listed in the approximate order in which they appear.

*Table 172: show ptp aggregated-ethernet interfaces*

Field Name	Field Description
<b>Bundle</b>	Name of the aggregated Ethernet bundle.
<b>Primary</b>	Primary interface in an aggregated Ethernet bundle. <ul style="list-style-type: none"> <li>• <b>active</b>—Indicates that the link is actively receiving ptp packets.</li> <li>• <b>down</b>—Indicates that the link is down.</li> </ul>
<b>Secondary</b>	Secondary interface in an aggregated Ethernet bundle. <ul style="list-style-type: none"> <li>• <b>active</b>—Indicates that the link is actively receiving ptp packets.</li> <li>• <b>ready</b>—Indicates that the link is ready to take over if the primary link fails.</li> </ul>
<b>Role</b>	Role of the aggregated Ethernet bundle: <ul style="list-style-type: none"> <li>• <b>Master, Slave, or Stateful</b></li> </ul>

## Sample Output

### show ptp aggregated-ethernet interfaces

```
user@host> show ptp aggregated-ethernet interfaces
```

bundle	primary	secondary	role
ae0.0	ge-1/0/1 (active)	ge-5/0/5 (ready)	slave
ae2.0	ge-5/0/1 (down)	ge-6/1/1 (active)	master

**show ptp aggregated-ethernet interfaces ( stateful ports)**

```
user@host> show ptp aggregated-ethernet interfaces
```

AE Bundle	Ifstate	Primary	Secondary	Role
ae0.0	Up	et-11/0/5(active)	et-11/1/2(secondary)	Stateful



## show ptp clock

<b>Syntax</b>	show ptp clock
<b>Release Information</b>	Command introduced in Junos OS Release 12.2. Command introduced in Junos OS Release 12.3 for ACX Series Routers. Command introduced in Junos OS Release 17.3 for QFX Series switches.
<b>Description</b>	(ACX Series, MX80, MX240, MX480, MX960 routers, and QFX Series switches) Display the details of the clock configured on the node.
<b>Options</b>	This command has no options.
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">IEEE 1588v2 PTP Boundary Clock Overview</a></li> <li>• <a href="#">IEEE 1588v2 Precision Timing Protocol (PTP)</a></li> <li>• <a href="#">Precision Time Protocol Overview on page 256</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">show ptp clock on page 2257</a> <a href="#">show ptp clock (ACX Series Routers) on page 2257</a>
<b>Output Fields</b>	<a href="#">Table 173 on page 2255</a> lists the output fields for the <b>show ptp clock</b> command. Output fields are listed in the approximate order in which they appear.

*Table 173: show ptp clock Output Fields*

Field Name	Field Description
Slot Number	Number of the FPC or MIC slot.
Two-step Clock	Whether the clock provides time information which is a combination of an event message and a subsequent general message: <b>True</b> or <b>False</b> .
Clock Identity	Clock identity of the slave or client as defined in IEEE 1588.
Total Ports on Device	Total number of PTP ports on the router.
Clock Class	Attribute of an ordinary or boundary clock that denotes the traceability of the time or frequency distributed by the grandmaster clock.
Clock Accuracy	Indicates the expected accuracy of a clock when it is the grandmaster, or in the event it becomes the grandmaster.

Table 173: show ptp clock Output Fields (continued)

Field Name	Field Description
<b>Log Variance</b>	Represents an estimate of the variations of the local clock when it is not synchronized via PTP to another clock.
<b>Clock Priority1</b>	Priority value of the clock. Lower value takes precedence.
<b>Clock Priority2</b>	Prioritize the masters to avoid confusion when the <b>Clock Priority1</b> value is the same for different masters in a network.
<b>UTC Offset</b>	Offset between International Atomic Time (TAI) and Coordinated Universal Time (UTC) times. The value is 34 seconds as of January 2012.
<b>Leap59</b>	When <b>TRUE</b> , the last minute of the current UTC day has only 59 seconds (instead of the 60 SI seconds).
<b>Leap61</b>	When <b>TRUE</b> , the last minute of the current UTC day has 61 seconds (instead of the 60 SI seconds).
<b>Time Traceable</b>	When <b>TRUE</b> , the timescale and the UTC offset are traceable to a primary reference.
<b>Frequency Traceable</b>	When <b>TRUE</b> , frequency determining the timescale is traceable to a primary reference.
<b>Time Source</b>	Time source external to the Precision Time Protocol (PTP), which provides time and/or frequency as appropriate. The time source is traceable to the international standards laboratories maintaining clocks that form the basis for the International Atomic Time (TAI) and Universal Coordinated Time (UTC) timescales. Examples of these are Global Positioning System (GPS), NTP, and National Institute of Standards and Technology (NIST) timeservers.
<b>Delay Req Sending Time</b>	Interval in seconds between the delay-request messages sent by the slave to the master.
<b>Steps Removed</b>	Number of boundary clocks between the local clock and the foreign master clock.
<b>Slave-only</b>	Set to <b>TRUE</b> , when the system is used in ordinary slave clock mode; otherwise, <b>FALSE</b> .
<b>Parent Id</b>	EUI-64 clock identifier of the immediate upstream master clock.
<b>GMC Id</b>	EUI-64 clock identifier of the grandmaster clock.
<b>GMC Class</b>	Denotes the grandmaster clock's traceability of the distributed time or frequency.
<b>GMC Accuracy</b>	Indicates the expected accuracy of the grandmaster clock.
<b>GMC Variance</b>	Represents an estimate of the variations of the grandmaster clock.
<b>GMC Priority1</b>	<b>Priority1</b> -value of the grandmaster clock.
<b>GMC Priority2</b>	<b>Priority2</b> -value of the grandmaster clock.

## Sample Output

### show ptp clock

```
user@host> run show ptp clock
```

#### Clock Details:

Slot Number	: 7		
Default Data:			
Two-step Clock	: FALSE	Clock Identity :	
00:05:85:ff:fe:73:ef:d0			
Total Ports on Device	: 0	Clock Class	: 255
Clock Accuracy	: 49	Log Variance	: -12944
Clock Priority1	: 128	Clock Priority2	: 128
UTC Offset	: 33	Leap59	: FALSE
Leap61	: FALSE	Time Traceable	: FALSE
Frequency Traceable	: FALSE	Time master	: 0
Delay Req Sending Time	: 0	Steps Removed	: 1
Slave-only	: NA		
Parent Data:			
Parent Id	: 00:18:0b:ff:ff:20:01:62		
GMC Id	: 00:18:0b:ff:ff:20:01:62	GMC Class	: 52
GMC Accuracy	: 254	GMC Variance	: 11952
GMC Priority1	: 0	GMC Priority2	: 0
Global Data:			
UTC Offset	: 34	Leap-59	: FALSE
Leap-61	: FALSE	Time traceable	: FALSE
Freq Traceable	: FALSE	Time Scale	: FALSE
Time master	: 160		

### show ptp clock (ACX Series Routers)

```
user@host> run show ptp clock
```

#### Clock Details:

Slot Number	: 0		
Default Data:			
Two-step Clock	: FALSE	Clock Identity :	
84:18:88:ff:fe:c0:7a:00			
Total Ports on Device	: 0	Clock Class	: 255
Clock Accuracy	: 34	Log Variance	: 15353
Clock Priority1	: 128	Clock Priority2	: 128
UTC Offset	: 0	Leap59	: FALSE
Leap61	: FALSE	Time Traceable	: FALSE
Frequency Traceable	: FALSE	Time Source	: 0
Delay Req Sending Time	: 0	Steps Removed	: 0
Slave-only	: NA		
Parent Data:			
Parent Id	: 00:00:64:ff:fe:01:01:02		
GMC Id	: 00:00:64:ff:fe:01:01:02	GMC Class	: 80
GMC Accuracy	: 35	GMC Variance	: 0
GMC Priority1	: 128	GMC Priority2	: 128
Global Data:			
UTC Offset	: 0	Leap-59	: FALSE
Leap-61	: FALSE	Time tracable	: FALSE
Freq Traceable	: FALSE	Time Scale	: FALSE
Time source	: 16		

## show ptp hybrid

**Syntax** `show ptp hybrid  
<config | status>`

**Release Information** Command introduced in Junos OS Release 12.2R2.

**Description** Display the current configuration and current operation mode of the slave.

**Options** **config**—Display the PTP source to Synchronous Ethernet interface mappings.  
**status**—Display the current hybrid mode operational status.

**Required Privilege Level** View

**Related Documentation**

- [Understanding Hybrid Mode on page 288](#)

**Output Fields** [Table 172 on page 2253](#) lists the output fields for the **show ptp hybrid** command. Output fields are listed in the approximate order in which they appear.

*Table 174: show ptp hybrid Output Fields*

Field Name	Field Description
<b>ptp source</b>	Displays the IP address of the PTP source.
<b>sync source</b>	Displays the interface name of the Synchronous Ethernet source through which the PTP source is traceable.
<b>Configured Mode</b>	Displays the current configured mode of the router as <b>Hybrid</b> .
<b>Operating Mode</b>	Displays the current operation mode: <b>Hybrid</b> or <b>None</b> .
<b>PTP Reference</b>	Displays the IP address and the interface name of the PTP reference clock.
<b>Synchronous Ethernet Reference</b>	Displays the interface name of the Synchronous Ethernet reference clock.
<b>Lock state</b>	Displays the current lock state of the router: <b>Locked</b> , <b>Initializing</b> , or <b>Acquiring</b> .

Table 174: show ptp hybrid Output Fields (continued)

Field Name	Field Description
<b>Lock state description</b>	<p>Displays the description for the current lock state of the router:</p> <ul style="list-style-type: none"> <li>• <b>Initializing</b>—Hybrid mode is being initialized.</li> <li>• <b>Acquiring Frequency</b>—Synchronous Ethernet source identified for frequency synchronization, acquiring frequency-related data from master clock.</li> <li>• <b>Frequency Locked, Acquiring Phase</b>—Frequency locked from the Synchronous Ethernet source, acquiring phase-related data from master clock.</li> <li>• <b>Frequency and Phase Locked</b>—Slave clock is frequency and phase synchronized with master clock.</li> </ul>

## Sample Output

### show ptp hybrid config

```
user@host> show ptp hybrid config

ptp source          sync source
100.1.1.2           ge-1/1/2
```

### show ptp hybrid status

```
user@host> show ptp hybrid status

Hybrid Mode Status:
Configured Mode       : Hybrid
Operating Mode        : Hybrid
PTP Reference         : 100.1.1.2, ge-1/0/0.0
Synchronous Ethernet Reference : ge-1/1/2
Lock state            : Locked
Lock state description : Frequency and Phase Locked
```

## show ptp lock-status

<b>Syntax</b>	<code>show ptp lock-status</code>
<b>Release Information</b>	Command introduced in Junos OS Release 12.2. Command introduced in Junos OS Release 17.3 for the QFX Series.
<b>Description</b>	(ACX Series, MX80, MX240, MX480, MX960 routers, and QFX Series switches) Display information about the lock status of the slave. The output verifies whether the slave is aligned to the grandmaster (master clock) or not.
<b>Options</b>	<b>detail</b> —Display detailed information about the lock status of the slave.
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">IEEE 1588v2 PTP Boundary Clock Overview</a></li> <li>• <a href="#">IEEE 1588v2 Precision Timing Protocol (PTP)</a></li> <li>• <a href="#">Precision Time Protocol Overview on page 256</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">show ptp lock-status on page 2261</a> <a href="#">show ptp lock-status (ACX Series) on page 2261</a> <a href="#">show ptp lock-status detail (ACX Series) on page 2261</a> <a href="#">show ptp lock-status detail (with IPv6 addresses for PTP master/slave) on page 2261</a>
<b>Output Fields</b>	<a href="#">Table 175 on page 2260</a> lists the output fields for the <b>show ptp lock-status</b> command. Output fields are listed in the approximate order in which they appear.

Table 175: show ptp lock-status Output Fields

Field Name	Field Description
<b>Lock State</b>	State of the slave clock with respect to its master clock: <ul style="list-style-type: none"> <li>• Freerun</li> <li>• Holdover</li> <li>• Phase Aligned</li> <li>• Acquiring</li> <li>• Initializing</li> <li>• Freq locked</li> </ul>
<b>Phase offset</b>	Time offset information of a slave clock with respect to its master clock. Precision of this time offset is 1 nanosecond.

Table 175: show ptp lock-status Output Fields (continued)

Field Name	Field Description
<b>State since</b>	Date, time, and how long ago the lock status of the PTP client or slave clock changed. The format is <b>State since: year-month-day hour:minute:second:timezone (hour:minute:second ago)</b> . For example, <b>State since: 2002-04-26 10:52:40 PDT (04:33:20 ago)</b> . On ACX Series routers, this field is displayed in Junos OS Release 15.1 and later.
<b>Selected Master Details</b>	<p>Details include the following:</p> <ul style="list-style-type: none"> <li>• <b>Upstream Master address</b>—The address of the remote master from which the slave acquires the clock.</li> <li>• <b>Slave interface</b>—The slave interface on this router corresponding to the Master above.</li> </ul> <p><b>NOTE:</b> On ACX Series router, if the PTP lock state is <b>FREERUN</b>, then the <b>Selected Master Details</b> field is not shown.</p>

## Sample Output

### show ptp lock-status

```
user@host> run show ptp lock-status
Lock Status:

Lock State      : 5 (PHASE ALIGNED)
Phase offset    : 0.000000001 sec
```

### show ptp lock-status (ACX Series)

```
user@host> show ptp lock-status
Lock Status:

Lock State      : 1 (FREERUN)
Phase offset    : 0.000000869 sec
```

### show ptp lock-status detail (ACX Series)

```
user@host> show ptp lock-status detail
Lock Status:

Lock State      : 5 (PHASE ALIGNED)
State since     : 2014-09-10 11:24:11 PDT (00:02:51 ago)

Phase offset    : 0.000000030 sec

Selected Master Details:
Upstream Master address : 13.13.13.1
Slave interface         : ge-0/1/5.0
```

### show ptp lock-status detail (with IPv6 addresses for PTP master/slave)

```
user@host> show ptp lock-status detail
```

**Lock Status:**

Lock State : 5 (PHASE ALIGNED)

Phase offset : -0.000000010 sec

**Selected Master Details:**

Upstream Master address : 2001:cdba:0000:0000:0000:0000:3257:9652

Slave interface : ge-0/2/0.0

Parent Id : 84:18:88:ff:fe:c0:34:00

GMC Id : 00:18:0b:ff:fe:20:03:14



## show ptp master

<b>Syntax</b>	<code>show ptp master</code> <code>&lt;brief   detail   interface&gt;</code>
<b>Release Information</b>	Command introduced in Junos OS Release 12.2. Command introduced in Junos OS Release 17.3 for the QFX Series.
<b>Description</b>	(MX80, MX240, MX480, MX960 routers, and the QFX Series) Display information about the configured master and the status of the master.
<b>Options</b>	<b>brief</b> —Display information about the master in brief. <b>detail</b> —Display information about the master in detail. <b>interface</b> —Display information about the configured interface of the master.
<b>Required Privilege Level</b>	View
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Precision Time Protocol Overview on page 256</a></li> <li>• <i>Configuring the Precision Time Protocol G.8275.2 Enhanced Profile (Telecom Profile)</i></li> </ul>
<b>Output Fields</b>	<a href="#">Table 176 on page 2263</a> lists the output fields for the <b>show ptp master</b> command. Output fields are listed in the approximate order in which they appear.

*Table 176: show ptp master Output Fields*

Field Name	Field Description
<b>Interface</b>	Name of the interface configured for Precision Time Protocol (PTP) on the master.
<b>Status</b>	Status of the Precision Time Protocol master: <ul style="list-style-type: none"> <li>• <b>Master</b> or <b>Slave</b></li> <li>• <b>Active</b> or <b>Inactive</b></li> <li>• <b>Initializing</b> or <b>Down</b></li> </ul>
<b>Local Address</b>	IP or MAC address of the configured master clock.
<b>Status</b> (Local address Status)	Status of the local address of the interface: <ul style="list-style-type: none"> <li>• <b>Configured</b> or <b>Not configured</b></li> <li>• <b>Master</b> or <b>Slave</b></li> <li>• <b>Active</b> or <b>Inactive</b></li> </ul>

Table 176: show ptp master Output Fields (continued)

Field Name	Field Description
<b>Status</b>  (Remote address Status)	Status of the remote address of the interface on the QFX Series: <ul style="list-style-type: none"> <li>• <b>Configured</b> or <b>Not configured</b></li> <li>• <b>Master</b> or <b>Slave</b></li> <li>• <b>Active</b> or <b>Inactive</b></li> </ul>
<b>Total Remote Slaves</b>	Number of remote slaves.
<b>Slave Address</b>	IP or MAC address of the slave.
<b>Status</b>  (Slave Address Status)	Status of the address of the slave: <ul style="list-style-type: none"> <li>• <b>Configured</b> or <b>Not configured</b></li> <li>• <b>Master</b> or <b>Slave</b></li> <li>• <b>Active</b> or <b>Inactive</b> or <b>Ready</b></li> </ul>

## Sample Output

### show ptp master

```

user@host> run show ptp master brief

PTP Master Interface Configured:

Master Interface      Status
ge-7/0/2.0           Master, Active

```

### show ptp master detail (Enterprise Profile on the QFX Series)

```

user@host> run show ptp master detail

PTP Master Interface Details:
Interface   : xe-0/0/6:1.0
Status      : Master, Active
Clock Info  :
  Local Address: 50.50.50.1      Status: Configured, Master, Active
  Remote Address: 224.0.1.129
  Total Remote Slaves: 1

```

### show ptp master detail (Enterprise Profile with dynamically learned master and slave interfaces for each physical interface on the QFX Series)

```

user@host> run show ptp slave detail

PTP Master Interface Details:

Interface   : xe-0/0/31:3.0
Status      : Master, Active
Clock Info  :
  Local Address: 10.10.10.2      Status: Configured, Master, Active
  Remote Address: 10.10.10.1      Status: Learned, Slave, Active
  Remote Address: 224.0.1.129    Status: Configured, Slave, Active

```

```

Total Remote Slaves: 2

Interface : xe-0/0/35:3.0
Status    : Master, Active
Clock Info :
  Local Address: 10.2.2.1      Status: Configured, Master, Active
  Remote Address: 10.2.2.24    Status: Learned, Slave, Active
  Remote Address: 10.2.2.29    Status: Learned, Slave, Active
  Remote Address: 10.2.2.30    Status: Learned, Slave, Active
  Remote Address: 10.2.2.32    Status: Learned, Slave, Active
  Remote Address: 10.2.2.35    Status: Learned, Slave, Active
  Remote Address: 10.2.2.52    Status: Learned, Slave, Active
  Remote Address: 10.2.2.61    Status: Learned, Slave, Active
  Remote Address: 224.0.1.129  Status: Configured, Slave, Active
Total Remote Slaves: 8

```

### show ptp master detail

```

user@host> run show ptp master detail

PTP Master Interface Details:
Interface : ge-7/0/2.0
Status    : Master, Active
Clock Info :
  Local Address: 10.0.0.1      Status: Configured, Master, Active
  Total Remote Slaves: 0
  Slave IP: 10.0.0.2          Status: Configured, Slave, Active

```

### show ptp master detail (with IPv6 addresses for PTP master/slave)

```

user@host> run show ptp master detail

PTP Master Interface Details:
Interface : ge-0/1/5.0
Status    : Master, Active
Clock Info :
  Local Address: 84:18:88:c0:60:a1 Status: Configured, Master, Active
  Remote Address: [Slave Mac]      Status: Configured, Slave, Active
Total Remote Slaves: 1

```

### show ptp interface ge-7/0/2.0

```

user@host> run show ptp master interface ge-7/0/2.0

PTP Master Interface Configured:

Master Interface      Status
ge-7/0/2.0           Master, Active

```

## show ptp path-trace detail

<b>Syntax</b>	show ptp path-trace detail
<b>Release Information</b>	Command introduced in Junos OS Release 13.3R4.
<b>Description</b>	(MX80, MX240, MX480, and MX960 routers) Display the details of the path an announce message takes in a PTP ring topology.
<b>Options</b>	This command has no options.
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">IEEE 1588v2 PTP Boundary Clock Overview</a></li> <li>• <a href="#">Precision Time Protocol Overview on page 256</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">show ptp path-trace detail on page 2266</a>
<b>Output Fields</b>	<a href="#">Table 177 on page 2266</a> lists the output fields for the <b>show ptp path-trace detail</b> command. Output fields are listed in the approximate order in which they appear.

*Table 177: show ptp path-trace detail Output Fields*

Field Name	Field Description
Hop Count	The count of the next router in a network trail where the announce message is received.
Member Clock Identity	Clock identity of the slave or client as defined in IEEE 1588.

## Sample Output

### show ptp path-trace detail

```

user@host> show ptp path-trace detail
Hop count      Member Clock Identity
-----
1              00:05:85:ff:fe:74:1f:d0
2              00:05:85:ff:fe:73:ef:d0

```

## show ptp phy-timestamping-interfaces

<b>Syntax</b>	show ptp phy-timestamping-interfaces
<b>Release Information</b>	Command introduced in Junos OS Release 17.1R1.
<b>Description</b>	Display information about the interfaces that have PHY timestamping enabled. PHY timestamping is the timestamping of the IEEE 1588 event packets at the physical layer. Timestamping the packet at the physical layer eliminates the noise or the packet delay variation (PDV) that is introduced by the Packet Forwarding Engine.
<b>Options</b>	This command has no options.
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Precision Time Protocol Overview on page 256</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">show ptp phy-timestamping-interfaces on page 2267</a>
<b>Output Fields</b>	<a href="#">Table 92 on page 923</a> lists the output fields for the <b>show ptp phy-timestamping-interfaces</b> command. Output fields are listed in the approximate order in which they appear.

*Table 178: show-ptp-phy-timestamping-interfaces*

Field Name	Field Description
PHY time-stamp interfaces	Name of the interface configured for phy-timestamping.

## Sample Output

### show ptp phy-timestamping-interfaces

```
user@host> show ptp phy-timestamping-interfaces
PHY time-stamp interfaces:
  xe-0/2/1
  xe-4/1/3
```

## show ptp port

<b>Syntax</b>	show ptp port <brief   detail> ifl <i>logical-interface-name</i>
<b>Release Information</b>	Command introduced in Junos OS Release 12.2. <i>ifl logical-interface-name</i> added in Junos OS Release 16.1.
<b>Description</b>	(MX80, MX240, MX480, and MX960 routers) Display information about the number of ports created according to the configuration. For each unique local IP address, one Precision Time Protocol port is created.
<b>Options</b>	<b>brief</b> —Display information about the PTP port in brief.  <b>detail</b> —Display information about the PTP port in detail.  <b>logical-interface-name</b> —Display PTP port information for a specific logical interface.
<b>Required Privilege Level</b>	View
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><a href="#">Precision Time Protocol Overview on page 256</a></li> </ul>
<b>Output Fields</b>	<a href="#">Table 179 on page 2268</a> lists the output fields for the <b>show ptp port</b> command. Output fields are listed in the approximate order in which they appear.

Table 179: show ptp port Output Fields

Field Name	Field Description
Local Interface	Local logical interface.
Local IP	IP address of the interface acting as the slave.
Remote IP	IP address of the remote node.
Clock Stream	Unique index for each session created.
Clock Identity	IP address of the slave.
Port State	Status of the port: <b>PTP listening</b> or <b>PTP initializing</b> .
Delay Req Interval	Interval in seconds between the delay request messages sent by the slave to the master.
Announce Interval	Logarithmic mean interval for the announce messages to be sent by the master.

Table 179: show ptp port Output Fields (continued)

Field Name	Field Description
<b>Announce Timeout</b>	Number of times the announce interval message has to pass between the slave and the master without receipt of an announce message.
<b>Sync Interval</b>	Logarithmic mean interval for sync interval messages to be sent by the master.
<b>Delay Mechanism</b>	Type of delay mechanism used.
<b>Port Number</b>	PTP port number.
<b>Operating Mode</b>	Clock mode of the node.
<b>Master Clock ID</b>	Unique clock-identity of the master.
<b>Previous Announce Messages</b>	Previous announce messages.
<b>Current Announce Message</b>	Current announce messages.

## Sample Output

### show ptp port brief

```
user@host> run show ptp port brief
```

```
PTP port-data:
Local IP      : 10.0.0.1      Remote IP      : 10.0.0.2
Clock Stream  : 1            Clock Identity : 00:05:85:ff:fe:73:ef:d0
Port State    : Listening     Delay Req Interval: -4
Announce Interval : 1        Announce Timeout : 3
Sync Interval : -6          Delay Mechanism  : End-to-end
Port Number   : 2            Operating Mode   : Master only

Local IP      : 10.10.1.10    Remote IP      : 10.10.1.2
Clock Stream  : 0            Clock Identity : 00:05:85:ff:fe:73:ef:d0
Port State    : Listening     Delay Req Interval: -4
Announce Interval : 1        Announce Timeout : 3
Sync Interval : -6          Delay Mechanism  : End-to-end
Port Number   : 1            Operating Mode   : BMC Mode
```

### show ptp port detail

```
user@host> run show ptp port detail
```

```
PTP port-data:
Local IP      : 10.0.0.1      Remote IP      : 10.0.0.2
Clock Stream  : 1            Clock Identity : 00:05:85:ff:fe:73:ef:d0
Port State    : Listening     Delay Req Interval: -4
Announce Interval : 1        Announce Timeout : 3
Sync Interval : -6          Delay Mechanism  : End-to-end
Port Number   : 2            Operating Mode   : Master only
```

```
Local IP      : 10.10.1.10      Remote IP      : 10.10.1.2
Clock Stream  : 0               Clock Identity   : 00:05:85:ff:fe:73:ef:d0
Port State    : Listening        Delay Req Interval: -4
Announce Interval : 1          Announce Timeout : 3
Sync Interval : -6             Delay Mechanism  : End-to-end
Port Number   : 1              Operating Mode   : BMC Mode
```

Foreign Master Clock Details:

```
Master Clock Id      : 00:18:0b:ff:ff:20:01:62
Previous Announce Messages : 8
Current Announce Messages : 1
```

```
user@host> show ptp port ifl ge-1/0/5.0
```

```
PTP port-data:
Local Interface      : ge-1/0/5.0
Local Address        : 2001:db8:00:05:85:73:b0:aa
Remote Address       : 2001:db8:01:80:c2:00:00:0e
Clock Stream         : 0               Clock Identity   : 2001:db8::85:ff:fe:73:b7:d0
Port State           : Master          Delay Req Interval: -4
Announce Interval    : 1              Announce Timeout : 3
Sync Interval        : -6             Delay Mechanism  : End-to-end
Port Number          : 1              Operating Mode   : Master only
```



## show ptp slave

<b>Syntax</b>	show ptp slave <brief   detail   interface>
<b>Release Information</b>	Command introduced in Junos OS Release 12.2. Command introduced in Junos OS Release 17.3 for the QFX Series.
<b>Description</b>	(MX80, MX240, MX480, MX960 routers, and the QFX Series) Display information about the configured slave and the status of the slave.
<b>Options</b>	<b>brief</b> —Display information about the slave in detail. <b>detail</b> —Display information about the slave in detail. <b>interface</b> —Display information about the configured interface of the slave.
<b>Required Privilege Level</b>	View
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Precision Time Protocol Overview on page 256</a></li> <li>• <i>Configuring the Precision Time Protocol G.8275.2 Enhanced Profile (Telecom Profile)</i></li> </ul>
<b>Output Fields</b>	<a href="#">Table 180 on page 2271</a> lists the output fields for the <b>show ptp slave</b> command. Output fields are listed in the approximate order in which they appear.

*Table 180: show ptp slave Output Fields*

Field Name	Field Description
<b>Interface</b>	Name of the interface configured for Precision Time Protocol.
<b>Status</b>	Status of the Precision Time Protocol slave: <ul style="list-style-type: none"> <li>• <b>Master</b> or <b>Slave</b></li> <li>• <b>Active</b> or <b>Inactive</b></li> <li>• <b>Initializing</b> or <b>Down</b></li> </ul>
<b>Interface</b>	Interface configured on the slave.
<b>Local Address</b>	IP or MAC address of the local interface.
<b>Status</b> (Local address Status)	Status of the local address of the interface acting as the slave: <ul style="list-style-type: none"> <li>• <b>Configured</b> or <b>Unconfigured</b></li> <li>• <b>Master</b> or <b>Slave</b></li> <li>• <b>Active</b> or <b>Inactive</b> or <b>Ready</b></li> </ul>

Table 180: show ptp slave Output Fields (continued)

Field Name	Field Description
<b>Status</b>  (Remote address Status)	Status of the remote address of the interface on the QFX Series: <ul style="list-style-type: none"> <li>• <b>Configured</b> or <b>Not configured</b></li> <li>• <b>Master</b> or <b>Slave</b></li> <li>• <b>Active</b> or <b>Inactive</b></li> </ul>
<b>Total Remote Masters</b>	Number of remote masters.
<b>Remote Master</b>	IP or MAC address of the remote node.
<b>Status (Slave IP Address Status)</b>	Status of the address of the master: <ul style="list-style-type: none"> <li>• <b>Configured</b> or <b>Unconfigured</b></li> <li>• <b>Master</b> or <b>Slave</b></li> <li>• <b>Active</b> or <b>Inactive</b></li> </ul>

## Sample Output

### show ptp slave

```
user@host> run show ptp slave
PTP Slave Interfaces Configured:

Slave Interface      Status
ge-7/0/0.0           Slave, Active
```

### show ptp slave detail

```
user@host> run show ptp slave detail
PTP Slave Interface Details:

Interface      : ge-7/0/0.0
Status         : Slave, Active
Clock Info
  Local address : 10.10.1.10           Status: Configured, Slave, Active
  Total Remote Masters: 0
  Remote Master: 10.10.1.2           Status: Configured, Master, Active
```

### show ptp slave detail (with IPv6 addresses for PTP master/slave)

```
user@host> run show ptp slave detail
PTP Slave Interface Details:

Interface      : ge-0/1/5.0
Status         : Slave, Active
Clock Info
  Local Address 2001:cdba:0000:0000:0000:0000:3257:9653 Status:
Configured, Slave, Active
  Remote Master:: 2001:cdba:0000:0000:0000:0000:3257:9652 Status: Configured,
```

```
Master, Active  
Total Remote Masters: 1
```

## show ptp stateful detail

<b>Syntax</b>	show ptp stateful detail
<b>Release Information</b>	Command introduced in Junos OS Release 17.1R1.
<b>Description</b>	Display information about the stateful interfaces.
<b>Options</b>	This command has no options.
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Precision Time Protocol Overview on page 256</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">show ptp stateful detail on page 2274</a>
<b>Output Fields</b>	Table 92 on page 923 lists the output fields for the <b>show ptp stateful detail</b> command. Output fields are listed in the approximate order in which they appear.

Table 181: show ptp stateful detail

Field Name	Field Description
Interface	Name of the configured stateful interface.
Status	Status of the stateful interface: stateful and active or inactive.
Local Address	MAC address of the configured stateful interfaces.
Status (of local address)	Status of the local address of the interface: <ul style="list-style-type: none"> <li>• Configured or not configured</li> <li>• Active or inactive</li> </ul>
Port Status	Status of the port configured: <ul style="list-style-type: none"> <li>• Master or slave</li> </ul>
Remote Address	MAC address of the remote stateful interface.

## Sample Output

### show ptp stateful detail

```
user@host> show ptp stateful detail
```

```
Interface : ge-7/0/1.0
Status    : Stateful, Active
Clock Info :
  Local Address: 01:00:5E:90:10:00  Status: Configured, Active
  Port Status: Slave
  Remote Address: 01:00:5E:90:10:FF
```

## show synchronous-ethernet esmc statistics

<b>Syntax</b>	<pre>show synchronous-ethernet esmc statistics &lt;brief interface <i>interface-name</i>&gt; &lt;detail interface <i>interface-name</i>&gt; &lt; interface <i>interface-name</i>&gt; &lt; interface <i>interface-name</i> (brief   detail)&gt;</pre>
<b>Release Information</b>	<p>Command introduced in Junos OS Release 11.2R4 for MX Series 5G Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 14.2R1 for PTX Series Packet Transport Routers.</p>
<b>Description</b>	(MX5, MX10, MX40, MX80, MX80-T, MX240, MX480, MX960, MX2010, MX2020 , and PTX Series routers only) Display the Synchronous Ethernet ESMC statistics.
<b>Required Privilege Level</b>	maintenance
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Synchronous Ethernet Overview on page 242</a></li> <li>• <a href="#">Configuring an External Clock Synchronization Interface for MX Series Routers on page 293</a></li> <li>• <a href="#">request chassis synchronization mode on page 910</a></li> <li>• <a href="#">request chassis synchronization switch on page 912</a></li> <li>• <a href="#">show synchronous-ethernet global-information on page 2280</a></li> <li>• <a href="#">show synchronous-ethernet esmc transmit on page 2278</a></li> <li>• <a href="#">clear synchronous-ethernet esmc statistics on page 837</a></li> </ul>
<b>List of Sample Output</b>	<p><a href="#">show synchronous-ethernet esmc statistics on page 2277</a></p> <p><a href="#">show synchronous-ethernet esmc statistics detail on page 2277</a></p> <p><a href="#">show synchronous-ethernet esmc statistics interface (PTX) on page 2277</a></p>
<b>Output Fields</b>	Table 182 on page 2276 lists the output fields for the <b>show synchronous-ethernet esmc statistics</b> command. Output fields are listed in the approximate order in which they appear.

Table 182: show synchronous-ethernet esmc statistics Output Fields

Field Name	Field Description
Interface Name	<b>interface-slot/pic/port</b> —Displays the name of the interface for which the ESMC statistics are displayed.
Transmit Count	<b>number</b> —Displays the number of ESMC packets transmitted.
Receive Count	<b>number</b> —Displays the number of ESMC packets received.

## Sample Output

### show synchronous-ethernet esmc statistics

```
user@host> show synchronous-ethernet esmc statistics
```

ESMC statistics:		
Interface Name	Transmit Count	Receive Count
ge-1/0/4	3540	0
ge-1/0/2	3539	0
ge-1/2/4	3540	0

### show synchronous-ethernet esmc statistics detail

```
user@host> show synchronous-ethernet esmc statistics detail
```

ESMC Statistics:	
Interface Name	: xe-2/0/10
Transmit Count	: 40908
Receive Count	: 40534
Total Drop Count	: 336
Ineligible Drop Count	: 0
Adjacency Count	: 4

### show synchronous-ethernet esmc statistics interface (PTX)

```
user@host> show synchronous-ethernet esmc statistics interface et-1/1/0:0
```

ESMC statistics:		
Interface Name	Transmit Count	Receive Count
et-1/1/0:0	358	338

## show synchronous-ethernet esmc transmit

<b>Syntax</b>	<pre>show synchronous-ethernet esmc transmit &lt;brief interface <i>interface-name</i>&gt; &lt;detail interface <i>interface-name</i>&gt; &lt; interface <i>interface-name</i>&gt; &lt; interface <i>interface-name</i> (brief   detail)&gt;</pre>
<b>Release Information</b>	<p>Command introduced in Junos OS Release 11.2R4 for MX80 Universal Routing Platforms.</p> <p>Command introduced in Junos OS Release 14.2R1 for PTX Series Routers.</p>
<b>Description</b>	(MX5, MX10, MX40, MX80, MX80-T, MX240, MX480, MX960, MX2010, MX2020, and PTX Series routers only) Display the Synchronous Ethernet ESMC transmit interface details.
<b>Required Privilege Level</b>	maintenance
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Synchronous Ethernet Overview on page 242</a></li> <li>• <a href="#">Configuring an External Clock Synchronization Interface for MX Series Routers on page 293</a></li> <li>• <a href="#">request chassis synchronization mode on page 910</a></li> <li>• <a href="#">request chassis synchronization switch on page 912</a></li> <li>• <a href="#">show synchronous-ethernet global-information on page 2280</a></li> <li>• <a href="#">show synchronous-ethernet esmc statistics on page 2276</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">show synchronous-ethernet esmc transmit on page 2279</a>
<b>Output Fields</b>	<p><a href="#">Table 183 on page 2278</a> lists the output fields for the <b>show synchronous-ethernet esmc transmit detail</b> command. Output fields are listed in the approximate order in which they appear.</p>

*Table 183: show synchronous-ethernet esmc transmit detail Output Fields*

Field Name	Field Description
Interface name	<b>interface-slot/pic/port</b> —Displays the name of the interface for which the ESMC transmit details are displayed.
Status	<b>string</b> —Displays the ESMC transmit interface status details.

## Sample Output

```
user@host# show synchronous-ethernet esmc transmit detail
```



```
ESMC Transmit interface details:
  Interface name: ge-1/0/4      Status: ESMC Tx (QL SSU-A/SSM 0x4)
  Interface name: ge-1/0/2      Status: ESMC Tx (QL DNU/SSM 0xf)
  Interface name: ge-1/2/4      Status: ESMC Tx (QL SSU-A/SSM 0x4)
```

### show synchronous-ethernet esmc transmit

```
user@host> show synchronous-ethernet esmc transmit

ESMC Transmit interfaces:
  xe-2/0/10
```

### show synchronous-ethernet esmc transmit (PTX)

```
user@host> show synchronous-ethernet esmc transmit

ESMC Transmit interfaces:
  et-1/1/0:0
  et-2/0/22:3
```

## show synchronous-ethernet global-information

<b>Syntax</b>	<code>show synchronous-ethernet global-information</code> <code>&lt;brief&gt;</code>
<b>Release Information</b>	Command introduced in Junos OS Release 11.2R4 for MX80-T, MX5, MX10, MX40, MX240, MX480, and MX960 routers. Command introduced in Junos OS Release 14.2R1 for PTX Series Routers.
<b>Description</b>	(MX5, MX10, MX40, MX80, MX80-T, MX240, MX480, MX960, and PTX routers only) Display information about the global configuration for Synchronous Ethernet chassis synchronization.
<b>Required Privilege Level</b>	maintenance
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Synchronous Ethernet Overview on page 242</a></li> <li>• <a href="#">Configuring an External Clock Synchronization Interface for MX Series Routers on page 293</a></li> <li>• <a href="#">request chassis synchronization mode on page 910</a></li> <li>• <a href="#">show synchronous-ethernet esmc statistics on page 2276</a></li> <li>• <a href="#">show synchronous-ethernet esmc transmit on page 2278</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">show synchronous-ethernet global-information (MX) on page 2281</a> <a href="#">show synchronous-ethernet global-information (PTX) on page 2281</a>
<b>Output Fields</b>	<a href="#">Table 184 on page 2280</a> lists the output fields for the <b>show synchronous-ethernet global-information</b> command. Output fields are listed in the approximate order in which they appear.

*Table 184: show synchronous-ethernet global-information Output Fields*

Field Name	Field Description
<b>Network option</b>	<b>(option-1(EEC1)   option-2(EEC2))</b> —Displays the network option configuration, either option-1(EEC1) or option-2(EEC2).
<b>Clock mode</b>	<b>(free-run   auto-select)</b> —Displays the configured mode of operation. The clock source can be either from the free-run local oscillator or from an external qualified clock. The default is auto-select mode.
<b>QL mode</b>	<b>(enable   disable)</b> —Displays the configured quality level mode configuration. The default is disable.
<b>Switchover mode</b>	<b>(revertive   non-revertive)</b> —Displays the configured synchronization clock switching mode. The default mode is revertive.

Table 184: *show synchronous-ethernet global-information Output Fields (continued)*

Field Name	Field Description
<b>Config change holdover</b>	<b>seconds</b> —Displays the time interval to wait before selecting the new clock source during a configuration change. The default value is 30 seconds.
<b>Switchover holdover</b>	<b>seconds</b> —Displays the time interval to wait before selecting the new clock source during switchover. The default value is 30 seconds.
<b>Reboot holdover</b>	<b>seconds</b> —Displays the time interval to wait before selecting the new clock source during reboot. The default value is 120 seconds.

## Sample Output

### show synchronous-ethernet global-information (MX)

```

user@host# show synchronous-ethernet global-information
Global Configuration:

Network option       : option-1(EEC1)
Clock mode           : Auto-select
QL mode              : Disabled
Switchover mode      : Revertive
Config change holdover : 15 seconds
Switchover holdover  : 30 seconds
Reboot holdover      : 120 seconds

```

### show synchronous-ethernet global-information (PTX)

```

user@host# show synchronous-ethernet global-information
Global Configuration:

Network option       : option-1(EEC1)
Clock mode           : Auto-select
Max transmit quality : PRC
QL mode              : Disabled
Clock selection mode  : Config-QL based
Switchover mode      : Revertive
Config change holdover : 15 seconds
Switchover holdover  : 30 seconds
Reboot holdover      : 120 seconds
RE Status             : Master
Global Wait to Restore : 0 min

```

