



Junos[®] OS

Chassis-Level Feature Guide

Release

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Documentation and Release Notes

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

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 <http://www.juniper.net/books>.

Supported Platforms

For the features described in this document, the following platforms are supported:

- M Series
- MX Series
- T Series
- PTX Series

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 xxxvii 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 xxxviii defines the text and syntax conventions used in this guide.

Table 2: Text and Syntax Conventions

Convention	Description	Examples
Bold text like this	Represents text that you type.	To enter configuration mode, type the configure command: user@host> configure
Fixed-width text like this	Represents output that appears on the terminal screen.	user@host> show chassis alarms No alarms currently active
<i>Italic text like this</i>	<ul style="list-style-type: none"> Introduces or emphasizes important new terms. Identifies guide names. Identifies RFC and Internet draft titles. 	<ul style="list-style-type: none"> A policy <i>term</i> is a named structure that defines match conditions and actions. <i>Junos OS CLI User Guide</i> RFC 1997, <i>BGP Communities Attribute</i>
<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@# set system domain-name <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"> To configure a stub area, include the stub statement at the [edit protocols ospf area area-id] hierarchy level. The console port is labeled CONSOLE.
< > (angle brackets)	Encloses optional keywords or variables.	stub <default-metric metric>;
| (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.	broadcast | multicast (string1 | string2 | string3)
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	rsvp { # Required for dynamic MPLS only
[] (square brackets)	Encloses a variable for which you can substitute one or more values.	community name members [community-ids]
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.	

GUI Conventions

Table 2: Text and Syntax Conventions (*continued*)

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

Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can provide feedback by using either of the following methods:

- Online feedback rating system—On any page of the Juniper Networks TechLibrary site at <http://www.juniper.net/techpubs/index.html>, simply click the stars to rate the content, and use the pop-up form to provide us with information about your experience. Alternately, you can use the online feedback form at <http://www.juniper.net/techpubs/feedback/>.
- E-mail—Send your comments to 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 <http://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf>.
- Product warranties—For product warranty information, visit <http://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: <http://www.juniper.net/customers/support/>
- Search for known bugs: <http://www2.juniper.net/kb/>
- Find product documentation: <http://www.juniper.net/techpubs/>
- Find solutions and answer questions using our Knowledge Base: <http://kb.juniper.net/>
- Download the latest versions of software and review release notes: <http://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications: <http://kb.juniper.net/InfoCenter/>
- Join and participate in the Juniper Networks Community Forum: <http://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Management tool: <http://www.juniper.net/cm/>

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

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 <http://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 <http://www.juniper.net/support/requesting-support.html>.

PART 1

Overview

- [Router Chassis Configuration Overview on page 3](#)
- [Router Chassis Clocking and Synchronization Configuration Overview on page 139](#)
- [Router Chassis Network Services Configuration Overview on page 195](#)
- [TX Matrix and TX Matrix Plus Router Configuration Overview on page 205](#)

CHAPTER 1

Router Chassis Configuration Overview

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Router Chassis Configuration Overview

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 specific 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*.

```
chassis {
  aggregated-devices {
    ethernet {
      device-count number;
      lacp {
        system-priority;
        link-protection;
      }
    }
    sonet {
      device-count number;
    }
  }
  alarm {
    interface-type {
      alarm-name (red | yellow | ignore);
    }
  }
  craft-lockout;
  fpc slot-number {
    allow-sram-parity-errors;
    port-mirror-instance port-mirroring-instance-name;
    power (off | on);
    sampling-instance;
    sanity-poll {
      retry-count number;
      on-error {
        raise-alarm;
        power cycle; | power off;
        write-coredump;
      }
    }
    pic pic-number {
      port-mirror-instance port-mirroring-instance-name;
      framing (t1 | e1);
      port port-number {
        speed (oc3-stm1 | oc12-stm4 | oc48-stm16);
      }
      adaptive-services {
        service-package (layer-2 | layer-3);
      }
      aggregate-ports;
      atm-cell-relay-accumulation;
      atm-l2circuit-mode (cell | aal5 | trunk trunk);
      vtmapping number;
      cel {
        e1 port-number {
```



```

        channel-group channel-number timeslots slot-number;
    }
}
ct3 {
    port port-number {
        t1 link-number {
            channel-group channel-number timeslots slot-number;
        }
    }
}
egress-policer-overhead bytes;
framing (sdh | sonet);
fru-poweron-sequence;
idle-cell-format {
    itu-t;
    payload-pattern payload-pattern-byte;
}
ingress-policer-overhead bytes;
linerate-mode;
max-queues-per-interface (8 | 4);
mlfr-uni-nni-bundles number;
number-of-ports;
no-concatenate;
q-pic-large-buffer {
    large-scale;
    small-scale;
}
red-buffer-occupancy {
    weighted-averaged [ instant-usage-weight-exponent weight-value ];
}
sparse-dlcis;
traffic-manager {
    egress-shaping-overhead number;
    ingress-shaping-overhead number;
    mode {
        egress-only;
        ingress-and-egress;
        session-shaping;
    }
}
tunnel-services {
    bandwidth (1g | 10g);
    vtmapping number (itu-t | klm);
}
}
feb slot-number {
    sanity-poll {
        retry-count number;
        on-error {
            raise-alarm;
            power cycle; | power off;
            write-coredump;
        }
    }
}
cfeb slot-number {
    sanity-poll {

```

```
    retry-count number;  
    on-error {  
        raise-alarm;  
        power cycle; | power off;  
        write-coredump;  
    }  
}  
fpc-resync;  
fpc-feb-connectivity {  
    fpc slot-number feb (slot-number | none);  
}  
lcc number {  
    fpc number {  
        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;  
            }  
            linerate-mode;  
            max-queues-per-interface (8 | 4);  
            no-concatenate;  
            no-multi-rate;  
            hash-key {  
                family {  
                    inet {  
                        layer-3;  
                        layer-4;  
                        symmetric-hash {  
                            complement;  
                        }  
                    }  
                    multiservice {  
                        source-mac;  
                        destination-mac;  
                        payload {  
                            ip {  
                                layer-3;  
                                layer-4;  
                            }  
                        }  
                        symmetric-hash {  
                            complement;  
                        }  
                    }  
                }  
            }  
        }  
    }  
}  
maximum-ecmp;  
offline;  
online-expected;  
sampling-instance;  
}
```

```

lcc-mode {
  lcc number {
    mode mode;
  }
}
memory-enhanced {
  filter;
  route;
  vpn-label;
}
(packet-scheduling | no-packet-scheduling);
pem {
  minimum number;
  feeds number-of-input-feeds;
  input-current amps-in-each-feed;
}
no-concatenate;
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;
    }
  }
  port-mirror-instance port-mirroring-instance-name;
  graceful-switchover;
  keepalive-time seconds;
  routing-engine slot-number (master | backup | disabled);
  sfm slot-number (always | preferred);
  ssb slot-number (always | preferred);
}
network-services (ethernet | ip);
routing-engine {
  on-disk-failure {
    disk-failure-action (halt | reboot);
  }
}
sfm slot-number {
  power off;
}
sib {
  minimum number;
}
vrf-mtu-check;
vtmapping (itu-t | klm);
synchronization {
  signal-type (e1 | t1);
  switching-mode (revertive | non-revertive);
  y-cable-line-termination;
  transmitter-enable;
}

```

```

validation-interval seconds;
primary (external-a | external-b);
secondary (external-a | external-b);
}
}

```



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 205](#) 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 210](#) 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]`.

Related Documentation

- [Router Chassis Configuration Statements on page 516](#)

Port-Mirroring Instances Overview

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).

For more information about configuring port mirroring on all routers, see the *Routing Policies, Firewall Filters, and Traffic Policers Feature Guide for Routing Devices*. 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 3D Universal Edge Routers on page 268](#)
 - [Configuring Port-Mirroring Instances on M320 Routers on page 259](#)
 - [Configuring Port-Mirroring Instances on M120 Routers on page 260](#)

Fabric Fault Handling Overview

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 780](#)
- [show chassis fabric fpcs on page 1125](#)
- [show chassis fabric sibs on page 1238](#)
- [show chassis sibs on page 1646](#)

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. A PTX5000 with SIB-I-PTX5008 provides an 8 + 1 active redundancy that supports linerate for all the eight FPC slots.

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 3 on page 14](#):

Table 3: List of Operational Mode Commands

Operational mode command	Description
show chassis sibs	Displays Switch Interface Boards (SIBs) status information.
show chassis fabric fpcs <slot number>	Displays the fabric state of the specified FPC slot. If no slot number is provided, it displays the status of all FPCs.
show chassis fabric sibs <slot number>	Displays the state of the electrical switch fabric link between the SIBs and the FPCs.
show chassis fabric reachability <detail>	Displays the current state of fabric destination reachability.
show chassis fabric unreachable-destinations	Displays the list of destinations that have transitioned from a reachable state to an unreachable state.
show pfe statistics error	Displays Packet Forwarding Engine error statistics.
show chassis fabric topology <sib_slot>	Displays the input-output link topology.
show chassis fabric summary	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 15](#)
- [FPC-Level Faults on page 16](#)

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 15](#)
- [Handling SIB-Level Faults on page 16](#)

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 3 on page 14](#) 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 16](#)
- [Handling FPC-Level Faults on page 17](#)

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 3 on page 14](#) 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.

Related Documentation

- *PTX5000 Packet Transport Router Description*
- *FPCs Supported on the PTX5000*
- *PTX5000 Switch Interface Board Description*

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

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-1CE-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-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 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 287](#)

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 1183](#)
 - [show chassis fabric fpcs on page 1125](#)

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 1757](#)
- [show ptp master on page 1752](#)

Fabric 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 277](#)
- [Example: Configuring Fabric Redundancy Mode on MPC4E on page 478](#)
- [redundancy-mode on page 650](#)
- [show chassis fabric destinations on page 1108](#)
- [show chassis fabric fpcs on page 1125](#)
- [show chassis fabric plane on page 1183](#)
- [show chassis fabric redundancy-mode on page 1230](#)
- [show chassis fabric summary on page 1250](#)

License Modes for Enhanced MPCs Overview

Enhanced MPCs are available in two license variants: IR and R. Depending on the license purchased, the enhanced MPC offers full or partial support for Layer 2, Layer 2.5, and Layer 3 features. [Table 4 on page 24](#) describes the two license variants.

Table 4: License Variants for MPCs

License	Description
IR	<ul style="list-style-type: none"> All MPLS and Layer 2 features, including IPv4 and IPv6 routing; MPLS transit, ingress and egress LSPs. Full IP FIB for peering and transit. 16 VPNs per MPC.
R	Full-scale Layer 2, Layer 2.5, and Layer 3 features.

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.

Related Documentation

- [Configuring the License Mode for Specific Enhanced MPCs on MX Series Routers on page 289](#)
- [Example: Configuring the License Mode for MPC5E on page 480](#)

Understanding the Hyper Mode Feature on Enhanced MPCs for MX Series Routers

Enhanced MPCs—MPC3E, MPC4E, MPC5E, and MPC6E 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 router to provide better performance and throughput.

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

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



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

Table 5 on page 25 displays the values of the current and configured mode based on the hyper mode configuration and system reboot.

Table 5: Current Mode and Configured Mode Values Based on Hyper mode Configuration

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

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

- Creation of Virtual Chassis
- 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.
- Padding of Ethernet frames with VLAN.

- 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 router, 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*

Related Documentation

- [Configuring Hyper Mode on Enhanced MPCs to Speed Up Packet Processing on page 290](#)
- [Unsupported Features and CLI Commands When Hyper Mode Is Enabled on page 26](#)
- `show forwarding-options hyper-mode`
- `hyper-mode (forwarding-options)`

Unsupported Features and CLI Commands When Hyper Mode Is Enabled

[Table 6 on page 26](#) 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 6: Unsupported Features and CLI Commands When Hyper Mode Is Enabled

Features	Commands	Error Message
Virtual Chassis	<code>set virtual-chassis preprovisioned</code>	To configure virtual-chassis, 'forwarding-options hyper-mode' should not be configured
	<code>set virtual-chassis member <i>member-id</i> role <i>role</i> serial-number <i>ser_num</i></code>	
	<code>set virtual-chassis no-split-detection</code>	

Table 6: Unsupported Features and CLI Commands When Hyper Mode Is Enabled (*continued*)

Features	Commands	Error Message
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 290](#)
 - [Understanding the Hyper Mode Feature on Enhanced MPCs for MX Series Routers on page 25](#)
 - `show forwarding-options hyper-mode`
 - `hyper-mode (forwarding-options)`

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.

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, 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 7 on page 29](#)

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 7: FPC Connection Limit Comparison

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



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 page 427](#)

- [Configuring the Power-On Sequence for FPCs on T640, T1600, and T4000 Routers on page 303](#)
- [pem on page 630](#)
- [feeds on page 564](#)
- [input-current on page 591](#)
- [fru-poweron-sequence on page 580](#)

Understanding Power Management on PTX5000 Packet Transport Router

The power management feature for Juniper Networks PTX5000 Packet Transport 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.

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 31](#)
- [FPC Priority and FPC Power Allocation on page 31](#)
- [FPC Priority and Changes in the Power Budget on page 32](#)

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 the Power-On Sequence for MPCs and FPCs on MX Series, T Series and PTX Series Packet Transport Routers” on page 307](#).

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 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.

Related Documentation

- [Configuring the Power-On Sequence for MPCs and FPCs on MX Series, T Series and PTX Series Packet Transport Routers on page 307](#)
- [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**

- [chassis ambient-temperature on page 540](#)
- [Monitoring the Power Consumption of PTX5000 FPCs by Configuring the Ambient Temperature on page 309](#)

Understanding Dynamic Power Management

You use the dynamic power management feature to better utilize the power available in the power entry module (PEM). When dynamic power management is configured, a

Modular Port Concentrator (MPC) is powered on only if the PEM can meet the worst-case power requirement for the MPC. 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 maximum power that each type of MIC consumes is maintained in a static database. The chassis manager process (**chassism**), which manages power budgeting for all line cards, uses this data when budgeting power for MICs. MICs are brought online only after the chassis manager verifies that the worst-case power required for the MICs and the power required for all the online FRUs are available in the PEM.

You can enable dynamic power management for MICs by enabling the **mic-aware-power-management** statement at the **[edit chassis]** hierarchy level. The feature is disabled by default. When dynamic power management is disabled, the chassis manager checks for worst-case power requirement of the MPC and the MICs that the MPC supports before allocating power for the MPC. Whereas, when dynamic power management is enabled, the chassis manager does not consider the worst-case power consumption by MICs at the configured ambient temperature while budgeting power for the MPC. Power budgeting for MICs is done only when 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.

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 restart.

Table 8: MPCs that Support Dynamic Power Management

MPC Models	Supported Junos OS Release	Supported Platforms
MPC3E-3D-NG, MPC3E-3D-NG-Q MPC2E-3D-NG, and MPC2E-3D-NG-Q	Junos OS Release 15.1R1	MX240, MX480, MX960, MX2010, and MX2020 routers
MPC6E	Junos OS Release 15.1F4	MX2010 and MX2020 routers



NOTE: Starting with Junos OS Release 15.1F4, dynamic power management is enabled by default.

Related Documentation

- [Configuring Dynamic Power Management to Optimize Power Utilization for MPCs on page 298](#)
- [Disabling Dynamic Power Management on page 300](#)
- [mic-aware-power-management on page 611](#)

Flexible Queuing Mode Overview

You can configure the non-hierarchical quality-of-service (non-HQoS) MPCs to support port-based flexible queuing. By default, the non-HQoS MPCs do not support queuing. To enable queuing, you must upgrade these MPCs through an add-on license. After you upgrade these MPCs, they can support a flexible queuing capability of up to 32,000 queues per port and per card, including queues on both ingress and egress interfaces. Channelized MICs are supported on non-HQoS MPCs only when flexible queuing is configured.

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

Related Documentation

- [Upgrading non-HQoS MPCs to Support Flexible Queuing on page 301](#)
- [flexible-queuing-mode on page 567](#)
- [MPC5E on MX Series Routers Overview on page 279](#)
- [MPC3E on MX Series Routers Overview on page 274](#)

Understanding Operations Support Systems Mapping

The operations support systems mapping feature is supported on the T4000 chassis. This feature prevents requalifying of an existing router on the customer's operations support system when a T1600 chassis or a T640 chassis is upgraded to a T4000 chassis.

The following sections explain this feature in detail:

- [Operations Support System Overview on page 37](#)
- [Methods to View the Updated Chassis Name on page 37](#)
- [Supported Platforms on page 37](#)
- [Points to Remember on page 38](#)

Operations Support System Overview

Operations support systems (OSS) is a networking system or software that is used by telecommunication providers and Internet service providers in conjunction with, and to operate, Juniper Networks products. The OSS is used to identify and qualify any existing or new Juniper product that is added to the network. To distinguish the different routers, the OSS uses the **Chassis** field, which is displayed in the output of the **show chassis hardware** operational command.

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 time-consuming process of qualifying it for the service provider network. The *OSS mapping feature* helps avoid this scenario.

Using the OSS mapping feature, you can map T4000 chassis to a T1600 chassis or a T640 chassis with the **set chassis oss-map model-name t640 | t1600** configuration command. This configuration command overrides the chassis model name (as is seen in the output of the **show chassis hardware** and the **show chassis oss-map** operational mode commands), 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.

Methods to View the Updated Chassis Name

After you execute the **set chassis oss-map model-name t640 | t1600** configuration command, you can view the updated chassis name through one of the following ways:

- Operational commands—The **show chassis hardware**, **show chassis hardware detail**, and **show chassis hardware extensive** operational commands display the configured known chassis name.
- SNMP MIBs—The **show snmp mib walk system** and **show snmp mib walk jnxBoxAnatomy** operational commands display the configured known chassis and object ID.

Supported Platforms

Table 9: Routers Supporting OSS Mapping

Supported Platforms	Junos OS Release
T4000	12.3R3

Table 9: Routers Supporting OSS Mapping (*continued*)

Supported Platforms	Junos OS Release
T4000	13.1R2
T4000	13.2R1

Points to Remember

The following points illustrate the functionality on the T4000 chassis that undergoes a change or remains unchanged as a result of OSS mapping:

- Chassis functionality and behavior remain unchanged.
- No change in field-replaceable unit (FRU) details or model numbers. However, note that new FRUs must be qualified through the normal process.
- The chassis personality is identified only by SIB type.
- No changes in system log messages.
- No change to other MIBs or traps other than system, jnxboxanatomy, and object ID.
- No change in Common Language Equipment Identifier (CLEI) details.
- OSS mapping works even after GRES or unified ISSU is performed. The backup Routing Engine is updated with the latest information after the **commit synchronize** command is executed.

Related Documentation

- [Configuring OSS Mapping to Represent a T4000 Chassis as a T1600 or a T640 Chassis on page 304](#)
- [Example: Configuring a T4000 Chassis to Represent a T640 Chassis on page 502](#)
- [oss-map on page 625](#)
- [show chassis oss-map on page 1569](#)

This chapter describes messages with the **CHASSISD** prefix. They are generated by the chassis process (chassisd), which controls hardware components on the routing platform.

CHASSISD_ACQUIRE_MASTERSHIP

System Log Message	Acquire mastership notification
Description	The chassis process (chassisd) running on the master Routing Engine received a request to acquire mastership.
Type	Event: This message reports an event, not an error
Severity	info
Facility	LOG_DAEMON
Cause	The Routing Engine was probably rebooting and graceful Routing Engine switchover is configured.

CHASSISD_ANTICF_PIM_CHECK_FAILED

System Log Message	PIM <i>pim-slot</i> failed anti-counterfeit check
Description	The indicated Physical Interface Module (PIM) failed the anti-counterfeit check performed by the chassis process (chassisd).
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON

CHASSISD_ANTICF_RE_CHECK_FAILED

System Log Message	Routing Engine failed anti-counterfeit check
Description	The Routing Engine failed the anti-counterfeit check performed by the chassis process (chassisd).
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON

CHASSISD_ANTICF_RE_ROM_READ_FAIL

System Log Message	Unable to read serial number from anti-counterfeit device for Routing Engine
Description	The chassis process (chassisd) could not read the serial number recorded in the ROM of the anti-counterfeit device for the Routing Engine.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_ANTICF_RE_SHA_READ_FAIL

System Log Message	Unable to read SHA output from anti-counterfeit device for Routing Engine
Description	The chassis process (chassisd) could not read Secure Hash Algorithm (SHA) information from the anti-counterfeit device for the Routing Engine.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_ANTICF_ROM_READ_FAILED

System Log Message	Unable to read serial number from anti-counterfeit device for PIM <i>pim-slot</i>
Description	The chassis process (chassisd) could not read the serial number recorded in the ROM of the anti-counterfeit device for the indicated Physical Interface Module.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_ANTICF_SHA_READ_FAILED

System Log Message	Unable to read SHA output from anti-counterfeit device for PIM <i>pim-slot</i>
Description	The chassis process (chassisd) could not read Secure Hash Algorithm (SHA) information from the anti-counterfeit device for the indicated Physical Interface Module (PIM).
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_ARGUMENT_ERROR

System Log Message	Unknown option <i>option</i>
Description	The indicated option, provided on the 'chassisd' command line, is invalid. The chassis process (chassisd) initialized but ignored the invalid option.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_BLOWERS_SPEED

System Log Message	Fans and impellers are now running at normal speed
Description	The fans (and impellers, if applicable) were running at the normal speed.
Type	Event: This message reports an event, not an error
Severity	info
Facility	LOG_DAEMON

CHASSISD_BLOWERS_SPEED_FULL

System Log Message	Fans and impellers being set to full speed [<i>reason</i>]
Description	For the indicated reason, the chassis process (chassisd) increased the speed of fans (and impellers, if applicable) to the maximum.
Type	Event: This message reports an event, not an error
Severity	info
Facility	LOG_DAEMON

CHASSISD_BLOWERS_SPEED_MEDIUM

System Log Message	Fans and impellers being set to intermediate speed
Description	The chassis process (chassisd) increased the speed of fans (and impellers, if applicable) to the intermediate level because of a temperature increase in the chassis.
Type	Event: This message reports an event, not an error
Severity	info
Facility	LOG_DAEMON

CHASSISD_BUS_DEVICE_OPEN_FAILURE

System Log Message	Unable to open ' <i>bus-type</i> ' bus device, error <i>error-message</i> (<i>error-code</i>)
Description	The chassis process (chassisd) could not open the indicated bus device for the indicated reason.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18776 .

CHASSISD_CB_CLOCK_CHECKSUM

System Log Message	Clock module on M120 CB had configuration data checksum error
Description	The chassis process (chassisd) detected a checksum error for the clock module on an M120 Control Board (CB).
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON

CHASSISD_CB_MASTER_BP_IGNORED

System Log Message	Press of online/offline button ignored for master <i>fru-name fru-slot</i>
Description	The online/offline button for the indicated control board was pressed, but the chassis process (chassisd) ignored the request. The control board for M40e and M160 routers is the Miscellaneous Control Subsystem (MCS). The control board for M320, T320, T640, MX240, MX480 and MX960 routers is the Control Board (CB).
Type	Event: This message reports an event, not an error
Severity	error
Facility	LOG_DAEMON
Cause	The control board was acting as master.
Action	Switch mastership to the other control board before taking the control board offline.

CHASSISD_CB_READ

System Log Message	Error reading midplane ID EEPROM, errno <i>error-code</i>
Description	The chassis process (chassisd) could not read the EEPROM on the midplane.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_CB_RE_ONLINE_BP_IGNORED

System Log Message	Unable to take <i>fru-name fru-slot</i> offline because paired Routing Engine is online
Description	The online/offline button for the indicated control board was pressed, but the chassis process (chassisd) ignored the request. The control board for M40e and M160 routers is the Miscellaneous Control Subsystem (MCS). The control board for M320, T320, T640, MX240, MX480 and MX960 routers is the Control Board (CB).
Type	Event: This message reports an event, not an error
Severity	error
Facility	LOG_DAEMON
Cause	The Routing Engine paired with the indicated control board is still online.
Action	Take the Routing Engine offline before taking the control board offline.

CHASSISD_CFEB_POWER_FAILURE

System Log Message	<i>function-name: unable to turn state power for CFEB cfep-slot</i>
Description	The chassis process (chassisd) could not turn on or turn off the power to the indicated Compact Forwarding Engine Board (CFEB).
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18777 .

CHASSISD_CLEAR_CONFIG_ERROR

System Log Message	<i>function-name: status</i>
Description	The chassis process (chassisd) encountered an error while trying to clear the state information associated with a copy of the management process (mgd) that it spawned to commit the rescue configuration. The commit operation succeeded or failed as indicated.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Cause	An internal software failure occurred.
Action	Contact your technical support representative.

CHASSISD_CLOCK_FAILURE

System Log Message	<i>function-name: fru-name error-message</i>
Description	The chassis process (chassisd) determined that the indicated clock source failed in the indicated way.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18778 .

CHASSISD_CLOCK_NOTICE

System Log Message	<i>fru-name: message</i>
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Description The clock-synchronization status of the indicated component (field-replaceable unit, or FRU) changed as indicated.

Type Event: This message reports an event, not an error

Severity notice

Facility LOG_DAEMON

CHASSISD_CLOCK_RESET_FAIL

System Log Message Zarlink module on Taz Base Board is not coming up after reset

Description The chassis process (chassisd) detected an error in the state of clock module.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_CMB_READBACK_ERROR

System Log Message Readback error from chassis management bus for *fru-name fru-slot* ([*0xaddress*, *0xoffset*] -> *0xerror-code*)

Description The chassis process (chassisd) could not read back information from the Chassis Management Bus (CMB) about the indicated component (field-replaceable unit, or FRU).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Cause The probable cause is hardware error.

Action Contact your technical support representative. For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18779>.

CHASSISD_COMMAND_ACK_ERROR

System Log Message Error occurred when *fru-name fru-slot* reported its online status: *error-message* (error code *error-code*)

Description The chassis process requested that the indicated component (field-replaceable unit, or FRU) confirm that it was online. The indicated error occurred when the FRU sent its response. In the normal case, the chassis process performed any additional action necessary to guarantee that the FRU came online.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18780>.

CHASSISD_COMMAND_ACK_SFM_ERROR

System Log Message *function-name: SFM sfm-slot did not acknowledge FPC fpc-slot: error error-message (code error-code)*

Description The chassis process (chassisd) requires an acknowledgment from each Switching and Forwarding Module (SFM) before it registers a Flexible PIC Controller (FPC) as online. The acknowledgment message from the indicated SFM failed for the indicated FPC.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18781>.

CHASSISD_CONCAT_MODE_ERROR

System Log Message Cannot set no-concatenated mode for FPC *fpc-slot* PIC *pic-slot*

Description The chassis process (chassisd) could not set channelized mode for the indicated SONET/SDH Physical Interface Card (PIC). Channelized mode is configured by including the no-concatenate statement at the [edit chassis fpc 'slot' pic 'slot'] hierarchy level.

Type Event: This message reports an event, not an error

Severity warning

Facility LOG_DAEMON

CHASSISD_CONFIG_ACCESS_ERROR

System Log Message *function-name: error-message*

Description The chassis process (chassisd) experienced the indicated problem while attempting to parse the configuration database.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Cause An internal software failure occurred.

Action Contact your technical support representative.

CHASSISD_CONFIG_CHANGE_IFDEV_DEL

System Log Message Deleting *argument1 interface-typesdev-numberargument2* due to configuration change

Description The chassis process (chassisd) deleted the indicated interface devices due to a change in the configuration.

Type Event: This message reports an event, not an error

Severity warning

Facility LOG_DAEMON

CHASSISD_CONFIG_INIT_ERROR

System Log Message Unable to parse configuration; using defaults

Description The chassis process (chassisd) could not parse the configuration and used default values while initializing.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_CONFIG_WARNING

System Log Message *function-name: warning-message, FPC fpc-slot PIC pic-slot*

Description The configuration that was specified for the indicated Physical Interface Card (PIC) is invalid for that type of PIC.

Type Event: This message reports an event, not an error

Severity warning

Facility LOG_DAEMON

CHASSISD_DEVICE_OPEN_ERROR

System Log Message Unable to open *device-name* device file (errno *error-code*)

Description The chassis process (chassisd) could not open the device file for the indicated device.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_EXEC_ERROR

System Log Message *function-name: error-message*

Description While trying to commit the rescue configuration, the chassis process (chassisd) encountered an error.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Cause	An internal software failure occurred.
Action	Contact your technical support representative.

CHASSISD_EXISTS

System Log Message	chassisd already running; exiting
Description	The chassis process (chassisd) exited because it discovered that another chassisd process is already running.
Type	Event: This message reports an event, not an error
Severity	warning
Facility	LOG_DAEMON

CHASSISD_EXISTS_TERM_OTHER

System Log Message	Killing existing chassisd and exiting
Description	The chassis process (chassisd) discovered that another chassisd process is already running. It terminated the other process and exited.
Type	Event: This message reports an event, not an error
Severity	warning
Facility	LOG_DAEMON

CHASSISD_FAN_FAILURE

System Log Message	<i>fru-name</i> in slot <i>fru-slot</i> failed
Description	The indicated fan or impeller failed. The chassis process (chassisd) raised an alarm and increased the speed of the remaining fans (and impellers, if applicable) to full speed.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18782 .

CHASSISD_FASIC_CONFIG_COMPLETE

System Log Message	Fchip: configuration already completed
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Description The chassis process (chassisd) detected an attempt to configure an F chip on a Control Board (CB) when configuration was already complete.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_FASIC_FTOKEN_ERROR

System Log Message Fchip (CB *control-board-slot*, ID *fchip-id*): ftoken overflow/underflow set (*data*) at *address*

Description The chassis process (chassisd) detected an underflow or overflow error on the indicated F chip on the indicated Control Board (CB).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18783>.

CHASSISD_FASIC_FTOKEN_INIT_ERROR

System Log Message Fchip (CB *control-board-slot*, ID *fchip-id*): f8chip_ftoken_init() stuck in ftoken loop, *addr=address*, *data=data*

Description The chassis process (chassisd) encountered an error while initializing memory at the indicated address for the indicated F chip on the indicated Control Board (CB).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18784>.

CHASSISD_FASIC_HSL_CONFIG_ERROR

System Log Message Fchip (CB *control-board-slot*, ID *fchip-id*): HSL configuration failed (*error error-message*)

Description The chassis process (chassisd) could not configure high speed links (HSL) for the indicated F chip on the indicated Control Board (CB).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18785>.

CHASSISD_FASIC_HSL_LINK_ERROR

System Log Message Fchip (CB *control-board-slot*, ID *fchip-id*): link *link-id* failed because of *error-message*

Description The chassis process (chassisd) detected an error for the indicated high speed link (HSL) for the indicated F chip on the indicated Control Board (CB).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18786>.

CHASSISD_FASIC_INIT_ERROR

System Log Message Fchips were not configured yet

Description The chassis process (chassisd) detected that F chips were not yet initialized on the Control Board (CB).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18787>.

CHASSISD_FASIC_INPUT_DROP

System Log Message Fchip (CB *control-board-slot*, ID *fchip-id*): dropped *drop-rate* cells per second coming from Packet Forwarding Engine *pfe* on FPC *fpc-slot*

Description The Packet Forwarding Engine divides packets into smaller units called cells for more efficient processing. As the indicated F chip on the indicated Control Board (CB) processed data that was received from the indicated Packet Forwarding Engine on the indicated Flexible PIC Concentrator (FPC), it dropped the indicated number of cells per second.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18788>.

CHASSISD_FASIC_OUTPUT_DROP

System Log Message	Fchip (CB <i>control-board-slot</i> , ID <i>fchip-id</i>): dropped <i>drop-rate</i> cells per second destined for Packet Forwarding Engine <i>pfe</i> on FPC <i>fpc-slot</i>
Description	The Packet Forwarding Engine divides packets into smaller units called cells for more efficient processing. As the indicated F chip on the indicated Control Board (CB) processed data before sending it to the indicated Packet Forwarding Engine on the indicated Flexible Port Concentrator (FPC) for outgoing transmission, it dropped the indicated number of cells per second.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18789 .

CHASSISD_FASIC_PIO_READ_ERROR

System Log Message	Fchip (CB <i>control-board-slot</i> , ID <i>fchip-id</i>): read error in <i>function-name()</i> for link# <i>link-id</i> at address <i>address</i> in register <i>register</i>
Description	The indicated routine failed with a read error at the indicated address and register for the indicated F chip and link on the indicated Control Board (CB).
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18790 .

CHASSISD_FASIC_PIO_WRITE_ERROR

System Log Message	Fchip (CB <i>control-board-slot</i> , ID <i>fchip-id</i>): write error in <i>function-name()</i> for link# <i>link-id</i> at address <i>address</i> in register <i>register</i>
Description	The indicated routine failed with a write error at the indicated address and register for the indicated F chip and link on the indicated Control Board (CB).
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18791 .

CHASSISD_FASIC_PLL_ERROR

System Log Message	Fchip (CB <i>control-board-slot</i> , ID <i>fchip-id</i>): unable to lock PLL
Description	The chassis process (chassisd) could not lock a phased-lock loop (PLL) for the indicated F chip on the indicated Control Board (CB).
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18792 .

CHASSISD_FASIC_RESET_ERROR

System Log Message	Fchip (CB <i>control-board-slot</i> , ID <i>fchip-id</i>): reset failed
Description	The chassis process (chassisd) could not reset the indicated F chip on the indicated Control Board (CB).
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18793 .

CHASSISD_FASIC_SRAM_ERROR

System Log Message	Fchip (CB <i>control-board-slot</i> , ID <i>fchip-id</i>): SRAM fuse did not initialize
Description	The chassis process (chassisd) detected that static RAM (SRAM) did not initialize properly for the indicated F chip on the indicated Control Board (CB).
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18794 .

CHASSISD_FASIC_VERSION_ERROR

System Log Message	Fchip (CB <i>control-board-slot</i> , ID <i>fchip-id</i>): part number <i>part-number</i> and version <i>version</i> were invalid
Description	The indicated part number and version detected for the indicated F chip on the indicated Control Board (CB) were not valid values.

Type Error: An error occurred
Severity error
Facility LOG_DAEMON

CHASSISD_FCHIP_CONFIG_COMPLETE

System Log Message Fchip: configuration already completed
Description The chassis process (chassisd) detected an attempt to configure an F chip when configuration was already complete.

Type Error: An error occurred
Severity error
Facility LOG_DAEMON

CHASSISD_FCHIP_CONFIG_MD_ERROR

System Log Message Fchip *fchip-id*: invalid number of Md chips (*count*) for Packet Forwarding Engine *pfe* on FPC *fpc-slot*
Description The chassis process (chassisd) detected an invalid number of Md chips for the indicated F chip, Packet Forwarding Engine and Flexible PIC Concentrator (FPC).

Type Error: An error occurred
Severity error
Facility LOG_DAEMON
Action For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18795>.

CHASSISD_FCHIP_CONFIG_RATE_ERROR

System Log Message Fchip *fchip-id*: unable to set rate limit on port *port*
Description The chassis process (chassisd) could not set the rate limit for the indicated F chip and port.

Type Error: An error occurred
Severity error
Facility LOG_DAEMON

CHASSISD_FCHIP_CONFIG_READ_ERROR

System Log Message Fchip *fchip-id*: unable to read configuration register
Description The chassis process (chassisd) could not read a configuration register on the indicated F chip.

Type Error: An error occurred

Severity error
Facility LOG_DAEMON

CHASSISD_FCHIP_FTOKEN_ERROR

System Log Message Fchip *fchip-id*: Ftoken overflow/underflow set (*data*) at *address*

Description The chassis process (chassisd) detected an underflow or overflow error on the indicated F chip.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FCHIP_FTOKEN_INIT_ERROR

System Log Message Fchip *fchip-id*: fchip_ftoken_init() stuck in ftoken loop, addr=*address*, data=*data*

Description The chassis process (chassisd) encountered an error while initializing memory at the indicated address for the indicated F chip.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FCHIP_HSR_ERROR

System Log Message Fchip high-speed receiver (HSR) error: *error-message*

Description The chassis process (chassisd) detected an error in the high-speed receiver (HSR) subsystem for the F chip with the indicated characteristics.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18796>.

CHASSISD_FCHIP_HSR_INIT_ERROR

System Log Message HSR: No vectors supplied

Description The chassis process (chassisd) could not initialize the high-speed receiver (HSR) subsystem for an F chip.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON

CHASSISD_FCHIP_HSR_INIT_LINK_ERR

System Log Message	Fchip <i>fchip-id</i> : unable to initialize HSR link <i>link-id</i>
Description	The chassis process (chassisd) could not initialize the indicated high-speed receiver (HSR) link for the indicated F chip.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON

CHASSISD_FCHIP_HSR_RESET_ERROR

System Log Message	Fchip <i>fchip-id</i> : hsr_reset error in fchip_init() on link <i>link-id</i>
Description	A high-speed receiver (HSR) reset error occurred during initialization of the indicated F chip and link.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON

CHASSISD_FCHIP_HST_ERROR

System Log Message	Fchip high-speed transmitter (HST) error: <i>error-message</i>
Description	The chassis process (chassisd) detected an error in the high-speed transmitter (HST) subsystem for the F chip with the indicated characteristics.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18797 .

CHASSISD_FCHIP_HST_INIT_ERROR

System Log Message	HST: No vectors supplied
Description	The chassis process (chassisd) could not initialize the high-speed transmitter (HST) subsystem for an F chip.

Type	Error: An error occurred
Severity	error

Facility LOG_DAEMON

CHASSISD_FCHIP_HST_INIT_LINK_ERR

System Log Message Fchip *fchip-id*: unable to initialize HST link *link-id*

Description The chassis process (chassisd) could not initialize the indicated high-speed transmitter (HST) link for the indicated F chip.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_FCHIP_HST_RESET_ERROR

System Log Message Fchip *fchip-id*: hst_reset error in fchip_init() on link *link-id*

Description A high-speed transmitter (HST) reset error occurred during initialization of the indicated F chip and link.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_FCHIP_INIT_ERROR

System Log Message Fchips were not configured yet

Description The chassis process (chassisd) detected that F chips were not yet initialized.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_FCHIP_LINK_ERROR

System Log Message SIBsib-slot_F0: *link-type* link *link-id* was bad

Description The chassis process (chassisd) detected an error for the indicated high-speed receiver (HSR) or high-speed transmitter (HST) link for an F chip on the indicated Switch Interface Board (SIB).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18798>.

CHASSISD_FCHIP_MONITOR_ERROR

System Log Message	F chip module was invalid
Description	The chassis process (chassisd) detected an invalid F-chip module while enabling or disabling the monitoring of F-chip functional blocks.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18799 .

CHASSISD_FCHIP_PIO_READ_ERROR

System Log Message	Fchip <i>fchip-id</i> : read error in <i>function-name()</i> for link# <i>link-id</i> , at address <i>address</i> in register <i>register</i>
Description	The indicated routine failed with a read error at the indicated address and register for the indicated F chip and link.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18800 .

CHASSISD_FCHIP_PIO_WRITE_ERROR

System Log Message	Fchip <i>fchip-id</i> : write error in <i>function-name()</i> for link# <i>link-id</i> , at address <i>address</i> in register <i>register</i>
Description	The indicated routine failed with a write error at the indicated address and register for the indicated F chip and link.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18801 .

CHASSISD_FCHIP_POLL_ERROR

System Log Message	Fchip <i>fchip-id</i> : <i>link-type link-id</i> poll returned error <i>error-code</i>
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Description	An error with the indicated error number occurred during polling of the indicated high-speed receiver (HSR) or high-speed transmitter (HST) link for the indicated F chip.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FCHIP_RATE_ERROR

System Log Message	Fchip <i>fchip-id</i> : per-port rate limit was not enabled
Description	The chassis process (chassisd) detected that per-port rate limiting was not enabled when it attempted to set the rate limit on an individual port for the indicated F chip.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FCHIP_SIB_NOT_STARTED

System Log Message	Unable to start <i>fru-name fru-slot</i> because F chips were not initialized
Description	The indicated Switch Interface Board (SIB) did not start because the F chips on it were not initialized.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FCHIP_VERSION_ERROR

System Log Message	F chip <i>fchip-id</i> : part number (<i>part-number</i>) and version (<i>version</i>) were invalid
Description	The indicated part number and version detected for the indicated F chip were not valid values.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON

CHASSISD_FEB_REVERSION

System Log Message	Reversion from FEB <i>fru-slot</i> to FEB <i>slot</i>
Description	The chassis daemon (chassisd) reverted to the indicated FEB from the specified FEB.
Type	Event: This message reports an event, not an error
Severity	error
Facility	LOG_DAEMON

CHASSISD_FEB_SWITCHOVER

System Log Message	Switchover from FEB <i>fru-slot</i> to FEB <i>slot</i>
Description	The chassis daemon (chassisd) switched to the indicated FEB from the specified FEB.
Type	Event: This message reports an event, not an error
Severity	error
Facility	LOG_DAEMON

CHASSISD_FHSR_READ_REG_ERROR

System Log Message	Fchip: fhsr_read() failed at address <i>address</i>
Description	The high-speed receiver (HSR) read routine failed at the indicated address on an F-chip register.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18802 .

CHASSISD_FHSR_WRITE_REG_ERROR

System Log Message	Fchip: fhsr_write() of value <i>value</i> failed at address <i>address</i>
Description	The high-speed receiver (HSR) write routine could not record the indicated value at the indicated address on an F-chip register.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18803 .

CHASSISD_FHST_READ_REG_ERROR

System Log Message	Fchip: fhst_read() failed at address <i>address</i>
Description	The high-speed transmitter (HST) read routine failed at the indicated address on an F-chip register.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18804 .

CHASSISD_FHST_WRITE_REG_ERROR

System Log Message	Fchip: fhst_write() of value <i>value</i> failed at address <i>address</i>
Description	The high-speed transmitter (HST) write routine could not record the indicated value at the indicated address on an F-chip register.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18805 .

CHASSISD_FILE_OPEN

System Log Message	File open: <i>filename</i> , error: <i>error-code</i> -- <i>error-message</i>
Description	The chassis process (chassisd) could not open the indicated file for the indicated reason.
Type	Error: An error occurred
Severity	critical
Facility	LOG_DAEMON
Action	For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18806 .

CHASSISD_FILE_STAT

System Log Message	File stat: <i>filename</i> , error: <i>error-code</i> -- <i>error-message</i>
Description	The chassis process (chassisd) could not open the indicated file because it could not obtain its status.
Type	Error: An error occurred

Severity error
Facility LOG_DAEMON

CHASSISD_FM_ACTION_FPC_OFFLINE

System Log Message FPC *fpc-slot* offline initiated to attempt healing of the fabric down condition.

Description The chassis process took the indicated FPC offline in an attempt to heal a fabric down condition, which caused the router to be incapable of carrying traffic.

Type Event: This message reports an event, not an error

Severity notice

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ACTION_FPC_ONLINE

System Log Message FPC *fpc-slot* online initiated to attempt healing of the fabric down condition.

Description The chassis process put the indicated FPC online in an attempt to heal a fabric down condition, which caused the router to be incapable of carrying traffic.

Type Event: This message reports an event, not an error

Severity notice

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ACTION_FPC_POWER_OFF

System Log Message FPC *fpc-slot* power off initiated to take down interfaces since the FPC is incapable of forwarding traffic due to the fabric down condition.

Description The chassis process powered off the indicated FPC to take down the FPC's interfaces and signal neighboring routers that the router is incapable of carrying traffic on the indicated FPC.

Type Event: This message reports an event, not an error

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ACTION_FPC_RECOVERY

System Log Message FPC *fpc-slot action* initiated to attempt healing of the *error-message* condition.

Description The chassis process took the indicated FPC action in an attempt to heal a fabric degradation/down condition which caused the router to be running in degraded performance or incapable of carrying traffic.

Type Event: This message reports an event, not an error

Severity notice

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ACTION_FPC_RESTART

System Log Message FPC *fpc-slot* restart initiated to attempt healing of the fabric down condition.

Description The chassis process restarted the indicated FPC in an attempt to heal a fabric down condition, which caused the router to be incapable of carrying traffic.

Type Event: This message reports an event, not an error

Severity notice

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ACTION_PLANE_OFFLINE

System Log Message Fabric plane *sib-plane* offline initiated to attempt healing of the fabric down condition.

Description The chassis process took the indicated fabric plane offline in an attempt to heal a fabric down condition, which caused the router to be incapable of carrying traffic.

Type Event: This message reports an event, not an error

Severity notice

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ACTION_PLANE_ONLINE

System Log Message Fabric plane *sib-plane* online initiated to attempt healing of the fabric down condition.

Description The chassis process put the indicated fabric plane online in an attempt to heal a fabric down condition, which caused the router to be incapable of carrying traffic.

Type Event: This message reports an event, not an error

Severity notice

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_BAD_STATE

System Log Message	<i>function-name</i> : unexpected state <i>statetype</i> for SIB# <i>sib-slot</i>
Description	The indicated function failed because it encountered the indicated type of unexpected internal state with respect to the indicated Switch Interface Board (SIB).
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_DETECT_FPC_FABRIC_DEGRADED

System Log Message	Detected FPC fabric degradation exceeds threshold. If no fabric planes come online in <i>elapsed-time</i> seconds actions will be taken to address the fabric <i>error-message</i> condition.
Description	The chassis process detected that the fabric planes are functioning at a degraded capacity and the router is running with degraded performance or not capable of carrying traffic coming in through the interfaces.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_DETECT_PLANES_DOWN

System Log Message	All fabric planes in the system have gone down after interfaces have been created. If no fabric planes come online in <i>elapsed-time</i> seconds, actions will be taken to address the fabric down condition.
Description	The chassis process detected all the fabric planes went down after interfaces were created and the router is not capable of carrying traffic coming in through the interfaces.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_DETECT_UNREACHABLE

System Log Message	Some fabric destinations PFEs in the system have become unreachable after interfaces have been created. If the unreachable PFE destinations are not fixed in <i>elapsed-time</i> seconds, actions will be taken to address the fabric down condition.
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Description	The chassis process detected that some Packet Forwarding Engine (PFE) destinations had become unreachable after interfaces were created, and the router is not capable of carrying traffic to the unreachable PFE destinations on the interfaces.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_ERROR

System Log Message	<i>function-name: error-message (SIB#sib-slot, Packet Forwarding Engine pfe on FPC fpc-slot)</i>
Description	During execution of the indicated fabric management routine, the indicated error occurred between the indicated Switch Interface Board (SIB) and the indicated Packet Forwarding Engine on the indicated Flexible PIC Concentrator (FPC).
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18807 .

CHASSISD_FM_ERROR_CLOS_F13_HSR

System Log Message	<i>FM: error-message errors occurred on link from F2S-f2-sib_SFfrom-fchip_s-port to F13SIBto-sfc-sib_SF3_to-fchip_d-port on plane sib-plane</i>
Description	In a Tx-Plus routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the T1600 routing nodes (called ST-SIB-Ls) and the SIBs in the TX Matrix Plus platform (called F13SIBs and F2S-SIBs). The chassis process (chassisd) on the SFC routing node detected an error in the electrical path between the indicated port on the indicated F2SIB and F13SIB on the indicated plane.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_ERROR_CLOS_F13_HST

System Log Message	<i>FM: error-message errors occurred on link from F13SIBfrom-sfc-sib_SF1_from-fchip_s-port to F2S-f2-sib_SFto-fchip_d-port on plane sib-plane</i>
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Description	In a Tx-Plus routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the T1600 routing nodes (called ST-SIB-Ls) and the SIBs in the TX Matrix Plus platform (called F13SIBs and F2S-SIBs). The chassis process (chassisd) on the SFC routing node detected an error in the transmit electrical path between the indicated port on the indicated F13SIB and F2SIB on the indicated plane.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_ERROR_CLOS_F2_HSR

System Log Message	FM: <i>error-message</i> errors occurred on link from F13SIB <i>from-sfc-sib_SF1_from-fchip_s-port</i> to F2S- <i>f2-sib_SFto-fchip_d-port</i> on plane <i>sib-plane</i>
Description	In a Tx-Plus routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the T1600 routing nodes (called ST-SIB-Ls) and the SIBs in the TX Matrix Plus platform (called F13SIBs and F2S-SIBs). The chassis process (chassisd) on the SFC routing node detected an error in the electrical path between the indicated port on the indicated F2SIB and F13SIB on the indicated plane.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_ERROR_CLOS_F2_HST

System Log Message	FM: <i>error-message</i> errors occurred on link from F2S- <i>f2-sib_SFfrom-fchip_s-port</i> to F13SIB <i>to-sfc-sib_SF1_to-fchip_d-port</i> on plane <i>sib-plane</i>
Description	In a Tx-Plus routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the T1600 routing nodes (called ST-SIB-Ls) and the SIBs in the TX Matrix Plus platform (called F13SIBs and F2S-SIBs). The chassis process (chassisd) on the SFC routing node detected an error in the transmit electrical path between the indicated port on the indicated F2SIB and F13SIB on the indicated plane.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_ERROR_F13_FB_HSR_TXP

System Log Message	<i>error-message errors on LCC lcc_FPC fpc-slot_pfe link via ST_SIB_L from-lcc-sib_FB fiber-bundle to F13SIB to-sfc-sib</i>
Description	In a Tx-Plus routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the T1600 routing nodes (called ST-SIB-Ls) and the SIBs in the TX Matrix Plus platform (called F13SIBs and F2S-SIBs). The chassis process (chassisd) on the routing node that houses the indicated F13SIB detected an error in the electrical path between the indicated ports on the F13SIB and the indicated ST-SIB-L on the indicated LCC.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_ERROR_F13_FB_RX_VC

System Log Message	<i>error-message on F13SIB from-sfc-sib_FB fiber-bundle VCSEL vcse1 Channel vcse1-channel connected from LCC lcc SIB_L to-lcc-sib</i>
Description	In a Tx-Plus routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the T1600 routing nodes (called ST-SIB-Ls) and the SIBs in the TX Matrix Plus platform (called F13SIBs and F2S-SIBs). The chassis process (chassisd) on the routing node that houses the indicated F13SIB detected the indicated error as packets that were traveling in the in the optical media from the indicated ST-SIB-L on the indicated LCC.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_ERROR_F13_FB_TXP

System Log Message	<i>F13SIB sib-slot_FB fiber-bundle LCC lcc ST_SIB_L to-lcc-sib is error-message</i>
Description	In a Tx-Plus routing matrix, the fiber-optic cable between each Switch Interface Board in a T1600 routing node (called a ST-SIB-L) must connect to a specific SIB port on the TX-Plus Matrix platform (called a F13SIB). The cable connected at the indicated F13SIB had the indicated error.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_F13_FB_TX_VC

System Log Message *error-message on F13SIBfrom-sfc-sib_FBfiber-bundle VCSEL vcsel Channel vcsel-channel connected to LCC lcc SIB_L to-lcc-sib*

Description In a Tx-Plus routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the T1600 routing nodes (called ST-SIB-Ls) and the SIBs in the TX Matrix Plus platform (called F13SIBs and F2S-SIBs). The chassis process (chassisd) on the routing node that houses the indicated F13SIB detected the indicated error as packets that were traveling in the indicated direction were translated between electrical and optical media.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_F13_VC_PWR

System Log Message *FM: High power difference at F13SIBfrom-sfc-sib_FBfiber-bundle VCSEL vcsel Channel vcsel-channel connected to LCC lcc SIB_Lsib-slot*

Description In a Tx-Plus routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the T1600 routing nodes (called ST-SIB-Ls) and the SIBs in the TX Matrix Plus platform (called F13SIBs and F2S-SIBs). The chassis process (chassisd) on the SFC routing node that houses the indicated F13SIB detected higher than configured receive power difference levels on the indicated fiber-bundles connected to the indicated LCC ST-SIB-L.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_LCC_SIB_CBL

System Log Message *Cable running from SFCerror-message lcc, lcc-sib-name, to LCCcable-name sc is sc-sib-name on plane sib-plane.*

Description In a Multi-chassis routing matrix, the fiber-optic cable between each SIB in a LCC routing node (called a LCC SIB) must connect to a specific SIB port on the Switch chassis platform. The cable connected at the indicated line card chassis SIB had the indicated error.

Type Error: An error occurred

Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_ERROR_LCC_SIB_HSR_PFE

System Log Message	<i>error-message errors on link from FPClcc PFElcc-name to pfe lcc-sib-name_asic-name,asic-port on LCCasic-chan and plane sib-plane</i>
Description	In a Multi-chassis routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the LCC routing nodes (called LCC SIBs) and the SIBs in the Switch Chassis platform (called F13SIBs and/or F2S-SIBs). The chassis process (chassisd) on the routing node that houses the indicated LCC SIB detected an error in the electrical path between the indicated LCC SIB and the indicated PFE on the FPC.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_ERROR_LCC_SIB_HSR_XC

System Log Message	<i>error-message errors on link from SFCsc sc-sib-name to LCClcc lcc-sib-name asic-name_asic-port,asic-chan on plane sib-plane</i>
Description	In a Multi-chassis routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the LCC routing nodes (called LCC SIBs) and the SIBs in the Switch Chassis platform (called F13SIBs and/or F2S-SIBs). The chassis process (chassisd) on the routing node that houses the indicated LCC SIB detected an error in the electrical path between the indicated ports on the LCC SIB and the corresponding SIB on Switch chassis.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_ERROR_LCC_SIB_OPTICS_FAULT

System Log Message	<i>Optics module on LCCerror-message lcc, lcc-sib-name, connected to SFCcable-name sc is sc-sib-name on plane sib-plane.</i>
Description	In a Multi-chassis routing matrix, fiber-optic modules are used to inter-connect each SIB in a LCC routing node (called a LCC SIB) to a specific SIB port on the Switch chassis

platform. The optics module connected at the indicated line card chassis SIB had the indicated error.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_ERROR_LCC_SIB_RX_OPTICS

System Log Message FM: *error-message* on optics channel in
LCClcc_lcc-sib-name_opt-dev-nameoptics,optics-channel

Description In a Multi-chassis routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the LCC routing nodes (called LCC SIBs) and the SIBs in the Switch Chassis platform (called F13SIBs and/or F2S-SIBs). The chassis process (chassisd) on the routing node that houses the indicated LCC SIB detected the indicated error in the optical media.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_ERROR_LCC_SIB_TX_OPTICS

System Log Message *error-message* on optics channel in
LCClcc_lcc-sib-name_opt-dev-nameoptics,optics-channel

Description In a Multi-chassis routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the LCC routing nodes (called LCC SIBs) and the SIBs in the Switch Chassis platform (called F13SIBs and/or F2S-SIBs). The chassis process (chassisd) on the routing node that houses the indicated LCC SIB detected the indicated error as packets that were traveling in the indicated direction were translated between electrical and optical media.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_ERROR_SC_CLOS_F13_HSR

System Log Message	FM: <i>error-message</i> errors occurred on link from SFC <i>sc</i> , <i>sc-f2ssib-name_asic-name_asic-port,asic-chan</i> to <i>sc-f13sib-name_dst-asic-name_dst-asic-port,dst-asic-chan</i> on plane <i>sib-plane</i>
Description	In a Multi-chassis routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the LCC routing nodes (called LCC SIBs) and the SIBs in the Switch Chassis platform (called F13SIBs and/or F2S-SIBs). The chassis process (chassisd) on the SFC routing node detected an error in the electrical path between the indicated port on the indicated F2SIB and F13SIB on the indicated plane.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_ERROR_SC_CLOS_F13_HST

System Log Message	FM: <i>error-message</i> errors occurred on link from SFC <i>sc</i> , <i>sc-f13sib-name_asic-name_asic-port,asic-chan</i> to <i>sc-f2ssib-name_dst-asic-name_dst-asic-port,dst-asic-chan</i> on plane <i>sib-plane</i>
Description	In a Multi-chassis routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the LCC routing nodes (called LCC SIBs) and the SIBs in the Switch Chassis platform (called F13SIBs and/or F2S-SIBs). The chassis process (chassisd) on the SFC routing node detected an error in the transmit electrical path between the indicated port on the indicated F13SIB and F2SIB on the indicated plane.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_ERROR_SC_CLOS_F2_HSR

System Log Message	FM: <i>error-message</i> errors occurred on link from SFC <i>sc</i> , <i>sc-f13sib-name_asic-name_asic-port,asic-chan</i> to <i>sc-f2ssib-name_dst-asic-name_dst-asic-port,dst-asic-chan</i> on plane <i>sib-plane</i>
Description	In a Multi-chassis routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the LCC routing nodes (called LCC SIBs) and the SIBs in the Switch Chassis platform (called F13SIBs and/or F2S-SIBs). The chassis process (chassisd) on the SFC routing node detected an error in the electrical

path between the indicated port on the indicated F2SIB and F13SIB on the indicated plane.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_ERROR_SC_CLOS_F2_HST

System Log Message FM: *error-message* errors occurred on link from SFC *sc*, *sc-f2ssib-name_asic-name_asic-port,asic-chan* to *sc-f13sib-name_dst-asic-name_dst-asic-port,dst-asic-chan* on plane *sib-plane*

Description In a Multi-chassis routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the LCC routing nodes (called LCC SIBs) and the SIBs in the Switch Chassis platform (called F13SIBs and/or F2S-SIBs). The chassis process (chassisd) on the SFC routing node detected an error in the transmit electrical path between the indicated port on the indicated F2SIB and F13SIB on the indicated plane.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_ERROR_SC_SIB_CBL

System Log Message Cable running from LCC *error-message sc*, *sc-sib-name*, to SFC *cable-name lcc* is *lcc-sib-name* on plane *sib-plane*.

Description In a Multi-chassis routing matrix, the fiber-optic cable between each SIB in a LCC routing node (called a LCC SIB) must connect to a specific SIB port on the Switch chassis platform. The cable connected at the indicated switch chassis SIB had the indicated error.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_ERROR_SC_SIB_HSR_XC

System Log Message *error-message* errors on link from LCC *lcc sc-sib-name* to SFC *sc sc-sib-name_asic-name_asic-port,asic-chan* on plane *sib-plane*

Description In a Multi-chassis routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the LCC routing nodes (called LCC SIBs) and the SIBs in the Switch Chassis platform (called F13SIBs and/or F2S-SIBs). The chassis process (chassisd) on the routing node that houses the indicated Switch chassis SIB detected an error in the electrical path between indicated ports on the Switch chassis SIB and the indicated LCC SIB on the indicated LCC.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_SC_SIB_OPTICS_FAULT

System Log Message Optics module on SFCerror-message *sc, sc-sib-name*, connected to LCCcable-name *lcc* is *lcc-sib-name* on plane *sib-plane*.

Description In a Multi-chassis routing matrix, fiber-optic modules are used to inter-connect each SIB in a LCC routing node (called a LCC SIB) to a specific SIB port on the Switch chassis platform. The optics module connected at the indicated switch chassis SIB had the indicated error.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_SC_SIB_RX_OPTICS

System Log Message FM: error-message on optics channel in SFCsc_sc-sib-name_opt-dev-nameoptics,optics-channel

Description In a Multi-chassis routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the LCC routing nodes (called LCC SIBs) and the SIBs in the Switch Chassis platform (called F13SIBs and/or F2S-SIBs). The chassis process (chassisd) on the routing node that houses the indicated Switch chassis SIB detected the indicated error as packets were traveling in the optical media from the indicated LCC SIB on the indicated LCC.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_SC_SIB_TX_OPTICS

System Log Message	<i>error-message</i> on optics channel in <i>SFCsc_sc-sib-name_opt-dev-nameoptics,optics-channel</i>
Description	In a Multi-chassis routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the LCC routing nodes (called LCC SIBs) and the SIBs in the Switch Chassis platform (called F13SIBs and/or F2S-SIBs). The chassis process (chassisd) on the routing node that houses the indicated Switch chassis SIB detected the indicated error as packets that were traveling in the indicated direction were translated between electrical and optical media.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_ERROR_SIB_L_FB_HSR

System Log Message	FM: HSR error <i>error-code</i> occurred on link from SIB-S port F(<i>s-row,s-port</i>) to SIB-L# <i>sib-slot</i> port F(<i>l-row,l-port</i>)
Description	In a routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the T640 routing nodes (called SIB-Ls) and the SIBs in the TX Matrix platform (called SIB-Ss). The chassis process (chassisd) on the routing node that houses the indicated SIB-L detected an error in the electrical path between the indicated ports on the SIB-L and the corresponding SIB-S.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18808 .

CHASSISD_FM_ERROR_SIB_L_FB_RX_VC

System Log Message	<i>error-message</i> on LCC <i>lcc</i> SIB_L <i>from-lcc-sib_FBfiber-bundle</i> VCSEL <i>vcsel</i> Channel <i>vcsel-channel</i> connected to F13SIBto- <i>sfc-sib</i>
Description	In a Tx-Plus routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the T1600 routing nodes (called ST-SIB-Ls) and the SIBs in the TX Matrix Plus platform (called F13SIBs and F2S-SIBs). The chassis process (chassisd) on the routing node that houses the indicated ST-SIB-L detected the indicated error as packets that were traveling in the optical media.
Type	Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_SIB_L_FB_SMF

System Log Message FM: *error-message* error occurred on link *to-from-sib* SIB-L#*sib-slot* *to-from-scc* SCC

Description In a routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the TX Matrix platform (the switch-card chassis, or SCC) and the SIBs in the T640 routing nodes (called SIB-Ls). The chassis process (chassisd) on the routing node that houses the indicated SIB-L detected the indicated error as packets that were traveling in the indicated direction were translated between electrical and optical media.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18809>.

CHASSISD_FM_ERROR_SIB_L_FB_TXP

System Log Message LCC *lcc* ST-SIB-L:*sib-slot* Fiber-bundle:*fiber-bundle* is *error-message*

Description In a Tx-Plus routing matrix, the fiber-optic cable between each Switch Interface Board in a T1600 routing node (called a ST-SIB-L) must connect to a specific SIB port on the TX-Plus Matrix platform (called a F13SIB). The cable connected at the indicated ST-SIB-L had the indicated error.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_ERROR_SIB_L_FB_TX_VC

System Log Message *error-message* on LCC *lcc* SIB_L*from-lcc-sib_FB**fiber-bundle* VCSEL *vcsel* Channel *vcsel-channel* connected to F13SIB*to-sfc-sib*

Description In a Tx-Plus routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the T1600 routing nodes (called ST-SIB-Ls) and the SIBs in the TX Matrix Plus platform (called F13SIBs and F2S-SIBs). The chassis process (chassisd) on the routing node that houses the indicated ST-SIB-L detected the indicated error as packets that were traveling in the indicated direction were translated between electrical and optical media.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_ERROR_SIB_L_HSR_PFE

System Log Message FM: *error-message* on LCC:lcc FPCfpc-slot_pfe link to ST-SIB-Lto-lcc-sib_fchip-id

Description In a Tx-Plus routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the T1600 routing nodes (called ST-SIB-Ls) and the SIBs in the TX Matrix Plus platform (called F13SIBs and F2S-SIBs). The chassis process (chassisd) on the routing node that houses the indicated ST-SIB-L detected an error in the electrical path between the indicated ST-SIB-L and the indicated PFE on the FPC.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_ERROR_SIB_L_HSR_TXP

System Log Message FM: *error-message* on LCC:lcc FPCfpc-slot_pfe link connected by ST-SIB-Lfrom-lcc-sib_fchip-id_s-port_FBfiber-bundle to F13SIBto-sfc-sib

Description In a Tx-Plus routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the T1600 routing nodes (called ST-SIB-Ls) and the SIBs in the TX Matrix Plus platform (called F13SIBs and F2S-SIBs). The chassis process (chassisd) on the routing node that houses the indicated ST-SIB-L detected an error in the electrical path between the indicated ports on the SIB-L and the corresponding F13SIB.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_ERROR_SIB_L_MISMATCH

System Log Message FM: fiber cable from SIB-L#sib-slot possibly connected to wrong SIB-S

Description In a routing matrix, the fiber-optic cable between each Switch Interface Board in a T640 routing node (called a SIB-L) must connect to a specific SIB port on the TX Matrix platform (called a SIB-S). The cable originating at the indicated SIB-L was possibly plugged into the wrong SIB-S port or wrong SIB-S.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_ERROR_SIB_L_VC_PWR

System Log Message FM: High power difference at LCC *lcc* SIB_L*sib-slot*_FB*fiber-bundle* VCSEL *vcsel* Channel *vcsel-channel* connected to F13SIB*from-sfc-sib*

Description In a Tx-Plus routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the T1600 routing nodes (called ST-SIB-Ls) and the SIBs in the TX Matrix Plus platform (called F13SIBs and F2S-SIBs). The chassis process (chassisd) on the routing node that houses the indicated ST-SIB-L detected higher than configured receive power levels on the indicated fiber-bundles connected to the indicated LCC ST-SIB-L.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_ERROR_SIB_S_FB_HSR

System Log Message FM: HSR error occurred on link from LCC*lcc* SIB-L port F(*l-row,l-port*) to SIB-S*#sib-slot* port F(*s-row,s-port*)

Description In a routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the TX Matrix platform (called SIB-Ss) and the SIBs in the T640 routing nodes (called SIB-Ls). The chassis process (chassisd) on the TX Matrix platform detected an error in the electrical path between the indicated port on the indicated SIB-S and the indicated port on a SIB-L installed in the indicated routing node (line-card chassis, or LCC).

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18810 .

CHASSISD_FM_ERROR_SIB_S_FB_SMF

System Log Message FM: *error-message* error occurred on link *to-from-sib-s* SIB-S*#sib-slot* *to-from-lcc* LCC*lcc*

Description In a routing matrix, packets traverse both electrical and optical media as they travel between the Switch Interface Boards (SIBs) in the TX Matrix platform (called SIB-Ss)

and the SIBs in the T640 routing nodes (line-card chassis, or LCCs). The chassis process (chassisd) on the TX Matrix platform detected the indicated error as packets that were traveling to or from the indicated LCC were translated between electrical and optical media.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18811 .

CHASSISD_FM_FABRIC_DEGRADED

System Log Message	DPCs are seeing grant timeouts; System is blackholing Need to attempt fabric healing. Action will be taken after <i>elapsed-time</i> seconds, to address the fabric down condition.
Description	The chassis process detected that the fabric planes are functioning at a degraded capacity and the router is not capable of carrying traffic coming in through the interfaces.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FM_FPC_FABRIC_DEGRADED

System Log Message	FPC <i>fpc-slot</i> running with <i>error-message</i> ,no attempt of healing due to configuration.
Description	The chassis process (chassisd) did not attempt healing due to user configuration or insufficient online planes.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Change the configuration (chassis) that prevent the healing.

CHASSISD_FM_MEMORY_ERROR

System Log Message	<i>function-name</i> : unable to allocate memory; <i>error-message</i>
Description	The chassis process (chassisd) could not allocate memory for a fabric operation.
Type	Error: An error occurred
Severity	warning

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FM_SIB_ERROR

System Log Message Fabric management error for SIB *sib-slot: error-message*

Description The chassis process (chassisd) detected the indicated type of error on the indicated Switch Interface Board (SIB) and performed the indicated action.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18812>.

CHASSISD_FM_SIB_FPC_TYPE_ERROR

System Log Message SIB *sib-slot* does not support features required for FPC Type 4

Description The indicated Switch Interface Board (SIB) does not support features required by the Flexible PIC Concentrator (FPC) Type 4.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FPC_JAM_HSL2_PARAMS_TIMEOUT

System Log Message *function-name*: attempt to jam params for *fru-name fru-slot* timed out

Description The indicated component (field-replaceable unit, or FRU) did not transfer the parameters within the time that is normally sufficient. If attempt failed, the chassisd process raised an alarm and left the FRU offline.

Type Event: This message reports an event, not an error

Severity error

Facility LOG_DAEMON

CHASSISD_FPC_NOT_FOUND

System Log Message *function-name*: unable to find FPC for PIC attachment operation

Description The chassis process (chassisd) attempted to bring a Physical Interface Card (PIC) online, but could not find the Flexible PIC Concentrator (FPC) that houses it.

Type	Error: An error occurred
Severity	warning
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FPC_OPTICS_HOT_NOTICE

System Log Message *fru-name* temperature over *temperature* degrees C; non-high-temperature tolerant optics will be disabled in *duration* seconds if condition persists

Description The temperature of FPC exceeded the trigger point to disable non-high-temperature tolerant optics. If the temperature did not decrease below the threshold within 10 minutes after message was logged, the chassisd process disable those affected optics.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Increase cooling on FRU or replace optics with high-temperature tolerant optics

CHASSISD_FPC_PIC_DETECT_TIMEOUT

System Log Message *function-name*: PIC detection on FPC *fpc-slot* timed out

Description The chassis process (chassisd) expects to receive notification within a timeout period that each Flexible PIC Concentrator (FPC) has attached the Physical Interface Cards (PICs) that it houses. It did not receive notification from the indicated FPC.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18813 .

CHASSISD_FPC_TYPE_SIB_TYPE_ERROR

System Log Message Installed SIB type (SIB-I8-F16) does not support features required by FPC *fpc-slot*

Description The indicated Flexible PIC Concentrator (FPC) is Type 4, which is not supported by Switch Interface Board (SIB) type SIB-I8-F16.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FRU_ALREADY_OFFLINE

System Log Message	<i>fru-name fru-slot</i> already offline
Description	The chassis process (chassisd) received a request to take the indicated component (field-replaceable unit, or FRU) offline, but the FRU was already offline.
Type	Event: This message reports an event, not an error
Severity	error
Facility	LOG_DAEMON

CHASSISD_FRU_ALREADY_ONLINE

System Log Message	Received request to bring <i>fru-name fru-slot</i> online; it was already online
Description	The chassis process (chassisd) received a request to bring the indicated component (field-replaceable unit, or FRU) online, but the FRU was already online.
Type	Event: This message reports an event, not an error
Severity	warning
Facility	LOG_DAEMON

CHASSISD_FRU_EVENT

System Log Message	<i>function-name: state fru-name fru-slot</i>
Description	The state of the indicated component (field-replaceable unit, or FRU) changed as indicated.
Type	Event: This message reports an event, not an error
Severity	notice
Facility	LOG_DAEMON

CHASSISD_FRU_FIRE_TEMP_CONDITION

System Log Message	<i>fru-name fru-slot sensor temperature temperature over threshold</i> degrees C (<i>message</i>); routing platform will shut down in <i>duration</i> seconds if condition persists
Description	The temperature of the specified component (field-replaceable unit, or FRU) exceeded the indicated temperature, which is the upper of two thresholds. The fans (and impellers, if applicable) that were cooling this FRU were in the indicated state. If the temperature does not go below the threshold within four seconds after the chassis process (chassisd) detects this condition, the chassisd process shuts down the routing platform. When this message was logged, the indicated number of seconds remained before shutdown.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON

Action Increase cooling in the area around the chassis.

CHASSISD_FRU_HIGH_TEMP_CONDITION

System Log Message *fru-name fru-slot sensor temperature temperature over threshold degrees C (message)*

Description The temperature of the specified component (field-replaceable unit, or FRU) exceeded the indicated temperature, which is the lower of two thresholds. The fans (and impellers, if applicable) that were cooling this FRU were in the indicated state. The chassis process (chassisd) increased the speed of all functioning fans (and impellers) that were cooling this component to full speed.

Type Event: This message reports an event, not an error

Severity error

Facility LOG_DAEMON

Action Increase cooling in the area around the chassis.

CHASSISD_FRU_INVALID_SLOT

System Log Message FRU *fru-name* is not supported in current slot

Description The chassis process (chassisd) detected that the indicated hardware component (field-replaceable unit, or FRU) was inserted in a slot that is not valid for that component type.

Type Error: An error occurred

Severity critical

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18814>.

CHASSISD_FRU_IO_ERROR

System Log Message *function-name: fru-name operation error: reason (error-message)*

Description The chassis process (chassisd) could not perform the indicated I/O operation on the indicated component (field-replaceable unit, or FRU).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_FRU_IO_OFFSET_ERROR

System Log Message *function-name: fru-name operation error: reason 0xoffset (error-message)*

Description	The chassis process (chassisd) could not perform the indicated I/O operation at the indicated byte offset.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_FRU_IPC_WRITE_ERROR

System Log Message	<i>function-name: FRU fru-name, errno error-code, error-message</i>
Description	The chassis process (chassisd) could not send an interprocess communication (IPC) message to the indicated component (field-replaceable unit, or FRU) because of the indicated error.
Type	Error: An error occurred
Severity	warning
Facility	LOG_DAEMON

CHASSISD_FRU_OFFLINE_FAILED

System Log Message	Unable to take <i>fru-name fru-slot</i> offline because FRU sequencer is active: <i>reason</i>
Description	The chassis process (chassisd) could not take the indicated component (field-replaceable unit, or FRU) offline for the indicated reason.
Type	Event: This message reports an event, not an error
Severity	notice
Facility	LOG_DAEMON

CHASSISD_FRU_OFFLINE_NOTICE

System Log Message	Taking <i>fru-name fru-slot</i> offline: <i>reason</i>
Description	The chassis process (chassisd) took the indicated component (field-replaceable unit, or FRU) offline for the indicated reason.
Type	Event: This message reports an event, not an error
Severity	notice
Facility	LOG_DAEMON

CHASSISD_FRU_OFFLINE_TIMEOUT

System Log Message	Offline request timed out; <i>fru-name fru-slot</i> restarted
Description	The indicated component (field-replaceable unit, or FRU) did not go offline within the time period that is normally sufficient for synchronized shutdown. After generating this

message, the chassis process (chassisd) tried several times to take the FRU offline and powered it down if all attempts failed.

Type Event: This message reports an event, not an error
Severity warning
Facility LOG_DAEMON

CHASSISD_FRU_ONLINE_TIMEOUT

System Log Message *function-name*: attempt to bring *fru-name fru-slot* online timed out

Description The indicated component (field-replaceable unit, or FRU) did not come online within the time that is normally sufficient. After generating this message, the chassis process (chassisd) tried to bring the FRU online several more times. If all attempts failed, the chassisd process raised an alarm and left the FRU offline.

Type Event: This message reports an event, not an error
Severity error
Facility LOG_DAEMON

CHASSISD_FRU_OVER_TEMP_CONDITION

System Log Message *fru-name fru-slot* sensor temperature *temperature* over *threshold* degrees C (*message*); FRU will shut down in *duration* seconds if condition persists

Description The temperature of the specified component (field-replaceable unit, or FRU) exceeded the indicated temperature, which is the upper of two thresholds. The fans (and impellers, if applicable) that were cooling this FRU were in the indicated state. If the temperature does not go below the threshold within four minutes after the chassis process (chassisd) detects this condition, the chassisd process shuts down the FRU or all FRUs in the same cooling zone. When this message was logged, the indicated number of seconds remained before shutdown.

Type Error: An error occurred
Severity error
Facility LOG_DAEMON
Action Increase cooling in the area around the chassis.

CHASSISD_FRU_STEP_ERROR

System Log Message *fru-name fru-slot* at step *step-number*

Description The power-on sequence for the indicated component (field-replaceable unit, or FRU) failed at the indicated point.

Type Error: An error occurred
Severity error

Facility LOG_DAEMON

CHASSISD_FRU_UNRESPONSIVE

System Log Message Error for *fru-name fru-slot: error-message; action*

Description The chassis process (chassisd) tried to bring the indicated component (field-replaceable unit, or FRU) online, but the attempt failed in the indicated way. As a result, the chassisd process performed the indicated action.

Type Event: This message reports an event, not an error

Severity error

Facility LOG_DAEMON

CHASSISD_FRU_UNRESPONSIVE_RETRY

System Log Message Attempt *count* to power on *fru-name fru-slot* timed out; restarted it

Description The chassis process (chassisd) tried the indicated number of times to bring the indicated component (field-replaceable unit, or FRU) online, but the attempts failed. In another attempt to bring the FRU online, the chassisd process issued the restart command for the FRU.

Type Event: This message reports an event, not an error

Severity error

Facility LOG_DAEMON

CHASSISD_FRU_UNSUPPORTED

System Log Message chassisd invalidated support for *fru-name fru-slot*

Description The chassis process (chassisd) invalidated support for the indicated component (field-replaceable unit, or FRU) during initialization.

Type Error: An error occurred

Severity warning

Facility LOG_DAEMON

CHASSISD_FRU_VERSION_MISMATCH

System Log Message *component* version mismatch for *fru-name* -- expected *expected-value*, got *received-value*

Description The chassis process (chassisd) verifies that it supports the revision level or version of a component (field-replaceable unit, or FRU). The revision level for the indicated FRU was unsupported or otherwise invalid.

Type Event: This message reports an event, not an error

Severity error

Facility LOG_DAEMON

Action Upgrade the FRU.

CHASSISD_GASIC_ID_ERROR

System Log Message Fchip: invalid SIB slot

Description A routine tried to determine the identifier for an application-specific integrated circuit (ASIC) on a Switch Interface Board (SIB). The attempt failed, because the supplied SIB slot number was invalid.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_GBUS_NOT_READY

System Log Message *function-name: fru-name* not ready for power up (RTIME_PWR_COND = 0x*value*)

Description The GBUS was not ready when the chassis process (chassisd) first tried to power it on, and the power-up operation timed out.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Cause The probable cause is hardware error.

Action Contact your technical support representative. For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18815>.

CHASSISD_GBUS_READBACK_ERROR

System Log Message Readback error from GBUS for *fru-name fru-slot* ([0x*gbus-address*, 0x*gbus-registers*] -> 0x*return-value*)

Description There was an error when the chassis process (chassisd) tried to read back information from the GBUS on the indicated component (field-replaceable unit, or FRU).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Cause The probable cause is hardware error.

Action Contact your technical support representative. For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18816>.

CHASSISD_GBUS_RESET_EVENT

System Log Message	<i>fru-name#fru-slot - command</i>
Description	The chassis process (chassisd) reset the GBUS for the indicated component (field-replaceable unit, or FRU). This is a normal part of startup.
Type	Event: This message reports an event, not an error
Severity	warning
Facility	LOG_DAEMON

CHASSISD_GBUS_SANITY_ERROR

System Log Message	<i>function-name: fru-name fru-slot -- management bus failed sanity test</i>
Description	The chassis process (chassisd) checks its management GBUS with a set of test operations when it is started. The tests failed.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_GENERIC_ERROR

System Log Message	<i>function-name: error-message</i>
Description	The chassis process (chassisd) detected the indicated error.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Perform any corrective actions mentioned in the error message.

CHASSISD_GENERIC_WARNING

System Log Message	<i>function-name: error-message</i>
Description	The chassis process (chassisd) generated the indicated warning message.
Type	Error: An error occurred
Severity	notice
Facility	LOG_DAEMON

CHASSISD_GETTIMEOFDAY

System Log Message	Unexpected error from gettimeofday: <i>error-code -- error-message</i>
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Description The chassis process (chassisd) could not obtain the time of day because of the indicated error.

Type Error: An error occurred

Severity warning

Facility LOG_DAEMON

CHASSISD_GRES_UNSUPP_PIC

System Log Message Unable to enable graceful Routing Engine switchover; PIC does not support it

Description The chassis process (chassisd) could not enable graceful Routing Engine switchover because an installed PIC does not support it.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_HIGH_TEMP_CONDITION

System Log Message Chassis temperature over *temperature* degrees C (*message*)

Description The temperature of one or more components (field-replaceable units, or FRUs) exceeded the indicated temperature, which is the lower of two thresholds. The fans (and impellers, if applicable) were in the indicated state. The chassis process (chassisd) increased the speed of all functioning fans and impellers to full speed.

Type Event: This message reports an event, not an error

Severity warning

Facility LOG_DAEMON

Action Increase cooling in the area around the chassis.

CHASSISD_HOST_TEMP_READ

System Log Message Error reading host temperature sensor

Description The chassis process (chassisd) could not read the temperature sensors on the routing platform.

Type Error: An error occurred

Severity notice

Facility LOG_DAEMON

CHASSISD_HSR_CONFIG_READ_ERROR

System Log Message *function-name*: unable to read configuration for HSR *identifier*

Description The indicated function could not read the configuration for the indicated high-speed receiver (HSR).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_HSR_CONFIG_WRITE_ERROR

System Log Message *function-name*: unable to write configuration for HSR *identifier*

Description The indicated routine could not write to the configuration for the indicated high-speed receiver (HSR).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_HSR_ELEMENTS_ERROR

System Log Message Provided number of HSR elements (*count*) was invalid

Description The indicated routine for processing a certain number of high-speed receiver (HSR) elements failed, because the supplied number of elements was invalid.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_HSR_FIFO_ERROR

System Log Message *function-name*: FIFO read failed for HSR *identifier*

Description A first in, first out (FIFO) read error occurred during execution of the indicated routine on the indicated high-speed receiver (HSR).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action For more information, see
<http://kb.juniper.net/InfoCenter/index?page=content&id=KB18817>.

CHASSISD_I2CS_READBACK_ERROR

System Log Message Readback error from I2C slave for *fru-name fru-slot* ([*0xi2cs-address*, *0xoffset*] -> *0xerror-code*)

Description	The chassis process (chassisd) could not read back information from the I2C slave (I2CS) about the indicated component (field-replaceable unit, or FRU).
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Cause	The probable cause is hardware error.
Action	Contact your technical support representative.

CHASSISD_I2C_BAD_IDEEPROM_FORMAT

System Log Message Invalid IDEEPROM format for *fru-name*

Description The chassis process (chassisd) determined that the ID EEPROM format specified for the indicated type of hardware component (field-replaceable unit, or FRU) is not valid for it.

Type	Error: An error occurred
Severity	critical
Facility	LOG_DAEMON
Action	Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18818 .

CHASSISD_I2C_FIC_PRESENCE_READ

System Log Message *function-name: fru-name* unable to get presence masks (*error-message*)

Description The chassis process (chassisd) could not read I2C data with presence information about the indicated component (field-replaceable unit, or FRU).

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_I2C_GENERIC_ERROR

System Log Message *function-name: error-message*

Description The indicated error occurred during an I2C access library operation.

Type	Error: An error occurred
Severity	error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_I2C_INVALID_ASSEMBLY_ID

System Log Message 'Oxassembly-id' is invalid value for *fru-name* assembly ID

Description The assembly ID for the indicated component (field-replaceable unit, or FRU) was not valid for its type.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_I2C_IOCTL_FAILURE

System Log Message *function-name*: operation ioctl failure for group *group-id* at address *Oxaddress* (errno *error-code*)

Description The chassis process (chassisd) could not perform the indicated ioctl() operation on the I2C data for the indicated component (field-replaceable unit, or FRU).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_I2C_IO_FAILURE

System Log Message *function-name*: *fru-name* operation failed for group *group-id* at address *Oxaddress*

Description The chassis process (chassisd) could not perform the indicated I/O operation on the I2C data for the indicated component (field-replaceable unit, or FRU).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_I2C_MIDPLANE_CORRUPT

System Log Message Corruption on midplane ID EEPROM (ID: *Oxassembly-id*, MAC address: *Oxmac-address*, *Oxversion*)

Description The chassis process (chassisd) found corrupted information when it tried to verify the parameters of the midplane's I2C ID EEPROM.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_I2C_RANGE_ERROR

System Log Message *function-name*: requested offset was out of range (offset *offset* + nbytes *count* > 256)

Description The indicated offset, which is greater than 256, was specified in a read request for an I2C device.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Cause No I2C device uses or has storage above an offset of 256.

Action Contact your technical support representative.

CHASSISD_I2C_READ_ERROR

System Log Message *function-name*: read error for group *group-id* at address *0xaddress*, offset *offset*

Description The chassis process (chassisd) could not read I2C data from the indicated device.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18819>.

CHASSISD_I2C_WRITE_ERROR

System Log Message *function-name*: write error for group *group-id* at address *0xaddress*, offset *offset*

Description The chassis process (chassisd) could not write I2C data to the indicated device.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_IDEEPROM_READ_ERROR

System Log Message	Unable to read <i>fru-name</i> ID EEPROM
Description	The chassis process (chassisd) could not read the I2C ID EEPROM of the indicated component (field-replaceable unit, or FRU).
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_IFDEV_CREATE_FAILURE

System Log Message	<i>function-name</i> : unable to create interface device for <i>interface-name</i> (<i>error-message</i>)
Description	The chassis process (chassisd) creates initial interface devices for newly installed Physical Interface Cards (PICs) and pseudodevices. It could not create a device for the indicated PIC or pseudodevice.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Cause	Necessary resources might have been unavailable.
Action	Contact your technical support representative.

CHASSISD_IFDEV_CREATE_NOTICE

System Log Message	<i>function-name</i> : created <i>device-name</i> for <i>interface-name</i>
Description	The chassis process (chassisd) created the initial interface device for the indicated newly installed Physical Interface Card (PIC) or pseudodevice.
Type	Event: This message reports an event, not an error
Severity	notice
Facility	LOG_DAEMON

CHASSISD_IFDEV_DETACH_ALL_PSEUDO

System Log Message	ifdev_detach(pseudo devices: all)
Description	The chassis process (chassisd) detached the interface devices for all pseudodevices.
Type	Event: This message reports an event, not an error
Severity	notice

Facility LOG_DAEMON

CHASSISD_IFDEV_DETACH_FPC

System Log Message `ifdev_detach_fpc(fpc-slot)`

Description The chassis process (chassisd) detached the interface devices for all Physical Interface Cards (PICs) installed in the indicated Flexible PIC Concentrator (FPC).

Type Event: This message reports an event, not an error

Severity notice

Facility LOG_DAEMON

Action For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18821>.

CHASSISD_IFDEV_DETACH_PIC

System Log Message `ifdev_detach_pic(fpc-slot/pic-slot)`

Description The chassis process (chassisd) detached the interface devices for the indicated Physical Interface Card (PIC).

Type Event: This message reports an event, not an error

Severity notice

Facility LOG_DAEMON

Action For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18822>.

CHASSISD_IFDEV_DETACH_PSEUDO

System Log Message `ifdev_detach(pseudo devices: porttype port-type, sdev=sdev-number, edev=edev-number)`

Description The chassis process (chassisd) detached the interface devices for the indicated pseudodevices.

Type Event: This message reports an event, not an error

Severity notice

Facility LOG_DAEMON

CHASSISD_IFDEV_DETACH_TLV_ERROR

System Log Message `ifdev_detach: rtslib_ifdm_change_tlvs failed for slot fpc-slot dev idx device-id error-message`

Description The chassis process (chassisd) asked the kernel to remove the indicated interface from the kernel interface table. The request failed.

Type Error: An error occurred

Severity error
Facility LOG_DAEMON

CHASSISD_IFDEV_GETBYNAME_NOTICE

System Log Message *function-name: ifdm get_by_name failed for interface-type interface device interface-name (error-message)*

Description The chassis process (chassisd) failed to find the indicated interface device, even though it just created it.

Type Event: This message reports an event, not an error
Severity warning
Facility LOG_DAEMON
Cause There was a problem with interface state creation.

Action Contact your technical support representative.

CHASSISD_IFDEV_GET_BY_INDEX_FAIL

System Log Message *function-name: rtslib_ifdm_get_by_index failed: error-code - error-message*

Description The chassis process (chassisd) could not obtain information about an interface device.

Type Error: An error occurred
Severity error
Facility LOG_DAEMON

CHASSISD_IFDEV_GET_BY_NAME_FAIL

System Log Message Unable to retrieve information for interface device *interface-name: error-message*

Description The chassis process (chassisd) could not obtain information about the indicated interface device.

Type Error: An error occurred
Severity error
Facility LOG_DAEMON

CHASSISD_IFDEV_NO_MEMORY

System Log Message *function-name: unable to allocate memory for interface-type interface*

Description The chassis process (chassisd) could not allocate memory when creating an interface device for the indicated interface type.

Type Error: An error occurred
Severity error

Facility LOG_DAEMON

Cause Resources on the system are extremely limited.

Action Eliminate the resource limitations and restart the PIC that houses the interface for which the interface device could not be created.

CHASSISD_IFDEV_RETRY_NOTICE

System Log Message *function-name: attempt count to add interface device interface-name failed (error-message)*

Description The chassis process (chassisd) tried the indicated number of times to create the indicated interface device, but the attempts failed. After generating this message, the chassisd process waited a while for resources to free up and tried again.

Type Event: This message reports an event, not an error

Severity warning

Facility LOG_DAEMON

Cause Necessary resources might have been unavailable. They should become available soon.

CHASSISD_IFDEV_RTSLIB_FAILURE

System Log Message *function-name: library-function-name failed (error-message)*

Description The chassis process (chassisd) could not create an interface device because an error occurred during the indicated call to the routing socket library.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_IFILTER_INSTALL_ERROR

System Log Message *function-name: RTSOCK Implicit Filter install failed. error=error-code*

Description The chassis process (chassisd) could not install a global implicit rtsock filter most likely due to a file operation error.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_IOCTL_FAILURE

System Log Message *function-name: reason for fru-name (error-message)*

Description	The chassis process (chassisd) could not perform the indicated ioctl() operation on the indicated component (field-replaceable unit, or FRU).
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_IPC_ANNOUNCE_TIMEOUT

System Log Message	<i>function-name</i> : no ack received from <i>fru-type</i> for <i>fru-name fru-slot</i> state change (<i>Oxsent-mask</i> , acks <i>Oxack-mask</i>)
Description	The chassis process (chassisd) notified the indicated components (field-replaceable units, or FRUs) that the component in the indicated slot was changing state. It did not receive the expected acknowledgment.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_IPC_CONNECTION_DROPPED

System Log Message	Dropped IPC connection for <i>fru-name fru-slot</i>
Description	The chassis process (chassisd) dropped its interprocess communication (IPC) connection to the indicated component (field-replaceable unit, or FRU).
Type	Event: This message reports an event, not an error
Severity	warning
Facility	LOG_DAEMON
Action	For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18823 .

CHASSISD_IPC_DAEMON_WRITE_ERROR

System Log Message	pipe_write failure for <i>connection-id</i> ; connection error: <i>error-message</i> (errno <i>error-code</i>)
Description	The chassis process (chassisd) could not write to a socket, because of the indicated error. The socket is for a connection to another process that runs on the Routing Engine and helps manage the chassis.
Type	Error: An error occurred
Severity	error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18824>.

CHASSISD_IPC_ERROR

System Log Message *function-name: error-message*

Description An error occurred when the chassis process (chassisd) received an interprocess communication (IPC) message.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_IPC_FLUSH_ERROR

System Log Message *function-name: flush operation failed for fru-name fru-slot*

Description The chassis process (chassisd) could not write to a socket that it was using to communicate with the indicated component (field-replaceable unit, or FRU).

Type Error: An error occurred

Severity warning

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_IPC_MSG_DROPPED

System Log Message Dropping message from connection queue: type = *message-type*, subtype = *message-subtype*

Description The chassis process (chassisd) dropped an interprocess communication (IPC) message because the message queue had already reached maximum capacity.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Cause The connection to a component (field-replaceable unit, or FRU) no longer exists, so the chassisd process cannot send all messages immediately as it usually does.

Action Contact your technical support representative. For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18825> and <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18825>.

CHASSISD_IPC_MSG_ERROR

System Log Message	<i>function-name</i> : error code <i>error-code</i> , type <i>message-type</i> , subtype <i>message-subtype</i> , opcode <i>message-opcode</i>
Description	The chassis process (chassisd) detected an error in an interprocess communication (IPC) message with the indicated characteristics.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_IPC_MSG_FRU_NOT_FOUND

System Log Message	<i>function-name</i> : unable to locate FRU for message with type <i>message-type</i> , subtype <i>message-subtype</i> , opcode <i>message-opcode</i>
Description	The chassis process (chassisd) could not locate a component (field-replaceable unit, or FRU) to handle the interprocess communication (IPC) message with the indicated characteristics that it received. The message was ignored.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_IPC_MSG_QFULL_ERROR

System Log Message	Dropping message from connection queue: type = <i>message-type</i> , subtype = <i>message-subtype</i>
Description	The chassis process (chassisd) had to discard a message because the queue of messages waiting for a connection was already full.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON

CHASSISD_IPC_MSG_UNHANDLED

System Log Message	<i>function-name</i> : unable to handle <i>fru-name</i> message with type <i>message-type</i> , subtype <i>message-subtype</i> , length <i>length</i> , opcode <i>message-opcode</i> , error <i>error-code</i>
Description	The chassis process (chassisd) received an interprocess communication (IPC) message about the indicated FRU. The message had the indicated characteristics. The chassisd process could not handle the message.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18826 .

CHASSISD_IPC_UNEXPECTED_MSG

System Log Message *function-name*: invalid message received: *message* (message type *message-type*, subtype *message-subtype*)

Description The chassis process (chassisd) received a unexpected message with the indicated characteristics.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_IPC_UNEXPECTED_RECV

System Log Message Received unexpected message from *connection-id*: type = *message-type*, subtype = *message-subtype*

Description The chassis process (chassisd) received an unexpected message from a peer connection.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON

CHASSISD_IPC_WRITE_ERROR

System Log Message *function-name*: pipe_write failure for SCC connection with error *error-code* (*error-message*)

Description A line-card chassis in a routing matrix attempted to send data to the TX Matrix platform (switch-card chassis, or SCC) over a pipe. The attempt failed with the indicated error.

Type	Error: An error occurred
Severity	warning
Facility	LOG_DAEMON

CHASSISD_IPC_WRITE_ERR_NO_PIPE

System Log Message FRU has no connection pipe *function-name* *fru-name*

Description The chassis process (chassisd) could not send a message to the indicated component (field-replaceable unit, or FRU) because the interprocess communication (IPC) pipe to the FRU no longer existed.

Type Error: An error occurred

Severity warning

Facility LOG_DAEMON

CHASSISD_IPC_WRITE_ERR_NULL_ARGS

System Log Message FRU has no connection arguments *function-name fru-name*

Description The chassis process (chassisd) could not send a message to the indicated component (field-replaceable unit, or FRU) because one or more required parameters had a null value.

Type Error: An error occurred

Severity warning

Facility LOG_DAEMON

Action For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18827>.

CHASSISD_ISSU_BLOB_ERROR

System Log Message *fru-name: error-message*

Description The chassisd process (chassisd) detected the indicated error while handling blobs (opaque information) for the indicated field replaceable unit (fru). The blobs are used by the fru to store state information across in service software upgrade(issu) reboot.

Type Error: An error occurred

Severity notice

Facility LOG_DAEMON

CHASSISD_ISSU_DAEMON_ERROR

System Log Message Daemon [*process-name*] state:<*state*> error:<*error-message*>

Description The chassisd process (chassisd) encountered the indicated error in the indicated in service software upgrade (issu) state for the indicated daemon.

Type Error: An error occurred

Severity notice

Facility LOG_DAEMON

CHASSISD_ISSU_ERROR

System Log Message *action error-code(error-message)*

Description The chassisd process (chassisd) encountered the indicated error for the indicated in service software upgrade process (issu) action.

Type Error: An error occurred

Severity notice

Facility LOG_DAEMON

CHASSISD_ISSU_FRU_ERROR

System Log Message *fru-name: state:[state] error-message*

Description The chassisd process (chassisd) encountered the indicated error during the in service software upgrade for the indicated field replaceable unit (fru).

Type Error: An error occurred

Severity notice

Facility LOG_DAEMON

CHASSISD_ISSU_FRU_IPC_ERROR

System Log Message *fru-name: state:[state] error:[message] reason:[error-message]*

Description The chassisd process (chassisd) detected the indicated error for the indicated field replaceable unit (fru) during in service software upgrade (issu).

Type Error: An error occurred

Severity notice

Facility LOG_DAEMON

CHASSISD_JTREE_ERROR

System Log Message *jtree terminate operation returned error-code*

Description The chassis process (chassisd) received the indicated error when executing the JUNOS system call that terminates the jtree.

Type Event: This message reports an event, not an error

Severity warning

Facility LOG_DAEMON

CHASSISD_LCC_RELEASE_MASTERSHIP

System Log Message Backup Routing Engine became master, because JUNOS version of former master did not match SCC master

Description The chassis process (chassisd) running on the master Routing Engine on a T640 routing node (line-card chassis, or LCC, in a routing matrix) relinquished mastership to the backup Routing Engine in the LCC.

Type	Event: This message reports an event, not an error
Severity	notice
Facility	LOG_DAEMON
Cause	The version of the JUNOS software on the master Routing Engine did not match the version on the TX Matrix platform's master Routing Engine. The version on the backup Routing Engine did match the TX Matrix platform.

CHASSISD_LOST_MASTERSHIP

System Log Message	Routing Engine lost mastership; exiting
Description	The chassis process (chassisd) running on the master Routing Engine exited, because mastership switched to the other Routing Engine.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_MAC_ADDRESS_AE_ERROR

System Log Message	chassisd MAC address allocation error for <i>aedevic-id</i>
Description	The chassis process (chassisd) could not obtain a media access control (MAC) address for the indicated aggregated Ethernet interface because of an internal error.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON

CHASSISD_MAC_ADDRESS_ATS_ERROR

System Log Message	chassisd MAC address allocation error for <i>atsdevice-id</i>
Description	The chassis process (chassisd) could not obtain a media access control (MAC) address for the indicated ATS Ethernet interface because of an internal error.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON

CHASSISD_MAC_ADDRESS_CBP_ERROR

System Log Message	chassisd MAC address allocation error for CBP
Description	The chassis process (chassisd) could not obtain a media access control (MAC) address for a customer backbone port because of an internal error.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON

CHASSISD_MAC_ADDRESS_ERROR

System Log Message	chassisd MAC address allocation exceed error for FPC <i>fpc-slot</i> , PIC <i>pic-slot</i> , port <i>port</i>
Description	The chassis process (chassisd) could not obtain a media access control (MAC) address for the indicated interface because of an internal error.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18828 .

CHASSISD_MAC_ADDRESS_FABRIC_ERR

System Log Message	Unable to allocate MAC address for fabric interface <i>device-id</i>
Description	The chassis process (chassisd) could not obtain a media access control (MAC) address for the indicated fabric interface because of an internal error.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18829 .

CHASSISD_MAC_ADDRESS_IRB_ERROR

System Log Message	chassisd MAC address allocation error for IRB
Description	The chassis process (chassisd) could not obtain a media access control (MAC) address for an integrated routing and bridging interface because of an internal error.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON

CHASSISD_MAC_ADDRESS_PIP_ERROR

System Log Message	chassisd MAC address allocation error for PIP
Description	The chassis process (chassisd) could not obtain a media access control (MAC) address for a provider instance port because of an internal error.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_MAC_ADDRESS_PLT_ERROR

System Log Message chassisd MAC address allocation error for PLT

Description The chassis process (chassisd) could not obtain a media access control (MAC) address for the pseudo logical tunnel interface because of an internal error.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_MAC_ADDRESS_SWFAB_ERR

System Log Message Unable to allocate MAC address for swfabric interface *device-id*

Description The chassis process (chassisd) could not obtain a media access control (MAC) address for the indicated swfabric interface because of an internal error.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_MAC_ADDRESS_VIRB_ERROR

System Log Message chassisd MAC address allocation error for IRB

Description The chassis process (chassisd) could not obtain a media access control (MAC) address for an integrated routing and bridging interface because of an internal error.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_MAC_ADDRESS_VLAN_ERROR

System Log Message chassisd MAC address allocation error for VLAN

Description The chassis process (chassisd) could not obtain a media access control (MAC) address for a vlan interface because of an internal error.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_MAC_ADDRESS_VTEP_ERROR

System Log Message	chassisd MAC address allocation error for VTEP
Description	The chassis process (chassisd) could not obtain a media access control (MAC) address for an integrated routing and bridging interface because of an internal error.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON

CHASSISD_MAC_DEFAULT

System Log Message	Using default MAC address base
Description	The chassis process (chassisd) used the default base media access control (MAC) address.
Type	Event: This message reports an event, not an error
Severity	info
Facility	LOG_DAEMON

CHASSISD_MAIN_THREAD_STALLED

System Log Message	main chassis-control thread stalled for <i>duration</i> sec -- exiting
Description	Chassis control daemon main thread did not run for a long duration.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	A core dump of chassis control daemon will be attempted.

CHASSISD_MALLOC_FAILURE

System Log Message	<i>function-name</i> : chassisd malloc failed, aborting
Description	The chassis process (chassisd) could not allocate memory. The chassisd process tried to continue functioning, but the lack of memory usually causes the process to fail. An administrator needs to restart it at some point.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18830 .

CHASSISD_MASTER_CG_REMOVED

System Log Message	Master <i>fru-name</i> (slot <i>fru-slot</i>) removed; powering it down
Description	The master Clock Generator (CG) was removed. The CG provides the clock for interfaces timing, so those interfaces might drop packets and experience other errors until a new clock source has been established.
Type	Error: An error occurred
Severity	critical
Facility	LOG_DAEMON

CHASSISD_MASTER_PCG_REMOVED

System Log Message	Master PCG (slot <i>pcg-slot</i>) removed; powering down Packet Forwarding Engine complex
Description	The master Packet Forwarding Engine Clock Generator (PCG) was removed. The PCG provides the system clock for all application-specific integrated circuits (ASICs) in the routing platform, so packet forwarding halts until the Packet Forwarding Engine is restarted and a PCG is functioning as master.
Type	Error: An error occurred
Severity	critical
Facility	LOG_DAEMON

CHASSISD_MASTER_SCG_REMOVED

System Log Message	Master SCG (slot <i>fru-slot</i>) removed; powering it down
Description	The master SONET Clock Generator (SCG) was removed. The SCG provides the clock for SONET/SDH interface timing, so those interfaces might drop packets and experience other errors until a new clock source is established.
Type	Error: An error occurred
Severity	critical
Facility	LOG_DAEMON

CHASSISD_MBUS_ERROR

System Log Message	<i>fru-name fru-slot</i> : management bus failed sanity test
Description	Startup tests on the indicated FRU's management bus failed.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_MCHASSIS_SWITCH_WARNING

System Log Message	CB settings on <i>chassis-type old-index</i> changed: switch is now ' <i>value</i> ', chassis index is now <i>0xnew-index</i>
Description	A toggle switch on the back of the Control Board on each platform in a routing matrix is set to 'M' (multichassis) on the T640 routing nodes and to 'S' (single-chassis) on the TX Matrix platform. On a T640 routing node, the adjacent dial is set to the node's index number in the routing matrix (0 through 3); on the TX Matrix platform it is set to 0. The setting of the toggle switch, the dial, or both, changed to the indicated values on the indicated platform. The new settings take effect when the routing matrix next reboots.
Type	Event: This message reports an event, not an error
Severity	warning
Facility	LOG_DAEMON
Action	If the changes were accidental, return the toggle and dial to the correct settings before the next reboot. If the changes were intended, disconnect and move the cables on the TX Matrix platform Switch Interface Board (SIB) to the row that corresponds to the T640 routing node's new index number.

CHASSISD_MCS_INTR_ERROR

System Log Message	Received SIGUSR2 without any interrupts pending
Description	The chassis process (chassisd) received the indicated interrupt signal. The signal normally indicates that an event on the Miscellaneous Control Subsystem (MCS) requires servicing. However, the chassisd process did not find such an event pending. This error does not usually cause component failure.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_MGR_CONNECT

System Log Message	<i>function-name</i> evSelectFD: initial pipe create aborted (errno <i>error-code</i>)
Description	The chassis process (chassisd) could not to open a pipe for interprocess communication (IPC) to a component (field-replaceable unit, or FRU).
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_MIC_OFFLINE_NOTICE

System Log Message	Taking MIC <i>mic-slot</i> in FPC <i>fpc-slot</i> offline: <i>reason</i>
Description	The chassis process (chassisd) took the indicated MIC offline, for the indicated reason.
Type	Event: This message reports an event, not an error
Severity	notice
Facility	LOG_DAEMON

CHASSISD_MULTILINK_BUNDLES_ERROR

System Log Message	Unable to set multilink Frame Relay UNI NNI bundles for PIC <i>pic-slot</i> in FPC <i>fpc-slot</i>
Description	The chassis process (chassisd) could not create multilink Frame Relay user-to-network interface and network-to-network interface (MLFR UNI NNI [FRF.16]) bundles for the indicated PIC.
Type	Error: An error occurred
Severity	warning
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_MXC_LINK

System Log Message	MXC: <i>operation: filename</i> , error: <i>error-code</i> -- <i>error-message</i>
Description	The chassis process (chassisd) could not link the specified package to the application services (AS-MXC) PIC.
Type	Error: An error occurred
Severity	critical
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_NO_CGS

System Log Message	No <i>fru-name</i> status
Description	The chassis process (chassisd) could not find an operational Clock Generator (CG). To continue functioning properly, interfaces that use a CG as their clock source must find another source.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_NO_PCGS

System Log Message No PCG *status*

Description The chassis process (chassisd) could not find an operational Packet Forwarding Engine Clock Generator (PCG). Packet forwarding is halted until a PCG becomes operational.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_NO_SCGS

System Log Message No SCG *state*

Description The chassis process (chassisd) could not find an operational SONET Clock Generator (SCG). To continue functioning correctly, SONET/SDH interfaces that use an SCG as their clock source must find another source.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_OFFLINE_NOTICE

System Log Message Routing Engine offline: *message*

Description The chassis process (chassisd) took the Routing Engine offline.

Type Event: This message reports an event, not an error

Severity critical

Facility LOG_DAEMON

CHASSISD_OID_GEN_FAILED

System Log Message Unable to generate OID: *oid (error-message)*

Description The chassis process (chassisd) could not generate an object identifier (OID) for the indicated object.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_OVER_TEMP_CONDITION

System Log Message Chassis temperature over *temperature* degrees C (*message*); routing platform will shutdown in *duration* seconds if condition persists

Description The temperature of one or more components (field-replaceable units, or FRUs) exceeded the indicated temperature, which is the upper of two thresholds. The fans (and impellers, if applicable) were in the indicated state. If the temperature does not go below the threshold within four minutes after the chassis process (chassisd) detects this condition, the chassisd process shuts down the routing platform. When this message was logged, the indicated number of seconds remained before shutdown.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Increase cooling in the area around the chassis. For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18832>.

CHASSISD_OVER_TEMP_SHUTDOWN_TIME

System Log Message Chassis temperature above *temperature* degrees C *description* (> *duration* seconds); powering down all FRUs

Description The chassis process (chassisd) shut down the routing platform because the temperature of one or more components exceeded the indicated threshold temperature for the indicated amount of time. Continued operation at the excessive temperature could damage the routing platform.

Type Error: An error occurred

Severity critical

Facility LOG_DAEMON

Action Increase cooling in the area around the chassis. For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18833>

CHASSISD_PARSE_COMPLETE

System Log Message Using new configuration

Description The chassis process (chassisd) successfully parsed its configuration file.

Type Event: This message reports an event, not an error

Severity info

Facility LOG_DAEMON

CHASSISD_PCI_ERROR

System Log Message	<i>function-name: error-message</i>
Description	While performing an operation on the PCI bus, the chassis process (chassisd) encountered the indicated error.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Cause	A software or a hardware problem occurred.
Action	Contact your technical support representative.

CHASSISD_PDU_BREAKER_TRIP

System Log Message	Circuit breaker tripped for PDU <i>pdu-slot</i>
Description	The circuit breaker was tripped for the indicated power distribution unit (PDU).
Type	Event: This message reports an event, not an error
Severity	warning
Facility	LOG_DAEMON
Action	Turn on the affected PDU manually.

CHASSISD_PDU_NOT_OK

System Log Message	<i>error-message</i> for PDU <i>pdu-slot</i> (status bits: <i>0xstatus-code</i>)
Description	The chassis process (chassisd) detected the indicated error condition for the indicated power distribution unit (PDU).
Type	Event: This message reports an event, not an error
Severity	warning
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_PEER_UNCONNECTED

System Log Message	<i>function-name: peer not connected</i>
Description	The chassis process (chassisd) processed a packet for a peer with an invalid or missing connection.
Type	Event: This message reports an event, not an error

Severity	error
Facility	LOG_DAEMON
Cause	In most cases, this error is caused by peers transitioning up and down unexpectedly. The error is usually transient and nonfatal.

CHASSISD_PEM_BREAKER_TRIP

System Log Message	Circuit breaker tripped for power supply <i>pem-slot</i>
Description	The circuit breaker was tripped for the indicated power entry module (PEM).
Type	Event: This message reports an event, not an error
Severity	warning
Facility	LOG_DAEMON
Action	Turn on the affected PEM manually.

CHASSISD_PEM_IMPROPER

System Log Message	Power supply <i>pem-slot</i> improper for platform
Description	Old PEM is not supported in this platform.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Replace old PEM with proper newer PEM

CHASSISD_PEM_INPUT_BAD

System Log Message	<i>error-message</i> for power supply <i>pem-slot</i> (status bits: <i>0xstatus-code</i>); check circuit breaker
Description	The chassis process (chassisd) detected the indicated error condition for the indicated power entry module (PEM).
Type	Event: This message reports an event, not an error
Severity	warning
Facility	LOG_DAEMON
Action	Check the status of the circuit breaker and the input connections.

CHASSISD_PEM_NOT_SUFFICIENT

System Log Message	Unable to power up FPC <i>fpc-slot</i> , because no three-input 240-A power supply is installed
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Description	On the T1600 router, the T1600-FPC4 ES Flexible PIC Concentrator (FPC) requires that at least one three-input 240-A power supply be installed. The chassis process (chassisd) did not power on the T1600-FPC4 ES in the indicated slot because the required power supply is not installed.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Install at least one three-input 240-A power supply.

CHASSISD_PEM_OVERLOAD

System Log Message	Overload condition for power supply <i>pem-slot</i> (status bits: <i>0xstatus-code</i>);
Description	The indicated power entry module (PEM) reported an output voltage overload condition.
Type	Event: This message reports an event, not an error
Severity	warning
Facility	LOG_DAEMON
Cause	There might have been excessive load on the PEM.
Action	Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18834 .

CHASSISD_PEM_TEMPERATURE

System Log Message	Temperature check bit set for power supply <i>pem-slot</i> ; airflow might be inadequate
Description	The chassis process (chassisd) detected that the 'temperature check bit' was set in the status bit mask for the indicated power entry module (PEM).
Type	Event: This message reports an event, not an error
Severity	warning
Facility	LOG_DAEMON
Cause	The PEM might have exceeded its temperature threshold, possibly because the airflow through it was inadequate.

CHASSISD_PEM_VOLTAGE

System Log Message	Power supply <i>pem-slot</i> reports problem; check output voltage
Description	The indicated power entry module (PEM) reported a problem with its output voltage.
Type	Event: This message reports an event, not an error
Severity	warning

Facility	LOG_DAEMON
Cause	There might have been excessive load on the PEM.
Action	Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18835 .

CHASSISD_PFE_LAUNCH_ERROR

System Log Message	Failed to launch PFE: <i>error-message</i>
Description	The chassis process (chassisd) failed to launch the PFE image.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON

CHASSISD_PIC_CMD_GIVEUP

System Log Message	<i>function-name</i> : attempt <i>fpc-slot</i> to bring PIC <i>pic-slot</i> in FPC <i>count</i> online timed out; stopped trying
Description	The chassis process (chassisd) tried the indicated number of times to bring the indicated PIC online, but stopped trying after all attempts failed.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_PIC_CMD_TIMEOUT

System Log Message	<i>function-name</i> : attempt to bring PIC <i>pic-slot</i> in FPC <i>fpc-slot</i> online timed out
Description	The chassis process (chassisd) tried to bring the indicated Physical Interface Card (PIC) online. The attempt took longer than the standard time allotted for that operation.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_PIC_CONFIG_CONFLICT

System Log Message	<i>fpc pic-slot pic fpc-slot</i> port mirror instance <i>instance</i> will be applied to both the PICs
Description	The PIC configuration will be applied to all PICs on the FPC

Type	Event: This message reports an event, not an error
Severity	unknown
Facility	LOG_DAEMON

CHASSISD_PIC_CONFIG_ERROR

System Log Message	Unable to create interface devices during attachment of PIC <i>pic-slot</i> in FPC <i>fpc-slot</i> : graceful switchover not supported
Description	The chassis process (chassisd) did not create an interface device for the indicated PIC because graceful switchover was enabled but is not supported in combination with that PIC type. A PIC must have an interface device to come online, so it remained offline.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Remove the PIC or upgrade the Junos OS.

CHASSISD_PIC_HWERROR

System Log Message	PIC <i>pic-slot</i> in FPC <i>fpc-slot</i> (PIC type <i>pic-type</i> , version <i>version</i>) had hardware error
Description	The indicated PIC experienced a hardware error. The chassis process (chassisd) did not bring the PIC online.
Type	Event: This message reports an event, not an error
Severity	warning
Facility	LOG_DAEMON
Action	Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18836 .

CHASSISD_PIC_OFFLINE_NOTICE

System Log Message	Taking PIC <i>pic-slot</i> in FPC <i>fpc-slot</i> offline: <i>reason</i>
Description	The chassis process (chassisd) took the indicated Physical Interface Card (PIC) offline, for the indicated reason.
Type	Event: This message reports an event, not an error
Severity	notice
Facility	LOG_DAEMON

CHASSISD_PIC_OID_GEN_FAILED

System Log Message	Unable to generate OID for PIC: <i>pic-name</i> (<i>error-message</i>)
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Description The chassis process (chassisd) could not generate an object identifier (OID) for the indicated Physical Interface Card (PIC).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_PIC_OID_UNKNOWN

System Log Message Unable to find OID for PIC: *i2c-id*

Description The chassis process (chassisd) could not determine the object identifier (OID) for the Physical Interface Card (PIC) with the indicated identifier.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_PIC_PORT_ERROR

System Log Message chassisd pic/port check and set error for FPC *fpc-slot*, PIC *pic-slot*, port *port*

Description The chassis process (chassisd) could not set the port attributes for the indicated interface because of an internal error.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_PIC_RESET_ON_SWITCHOVER

System Log Message PIC *pic-slot* in FPC *fpc-slot* (type *pic-type*: *pic-name*, version *version*) does not support GRES and will be reset on switchover

Description The chassis process (chassisd) noted that the Physical Interface Card (PIC) with the indicated characteristics needs to be reset when a graceful switchover occurs.

Type Event: This message reports an event, not an error

Severity warning

Facility LOG_DAEMON

CHASSISD_PIC_SPEED_INVALID

System Log Message	Set speed for <i>so-fpc-slot/pic-slot/port</i> to <i>default-value</i> because configured value <i>current-value</i> is invalid
Description	The chassis process (chassisd) set the speed for the indicated Physical Interface Card (PIC) to the indicated value, because the configured value is either higher than the maximum valid value or lower than the minimum valid value.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Reconfigure the PIC with a valid speed.

CHASSISD_PIC_VERSION_ERROR

System Log Message	Hardware version (<i>pic-slot</i>) of PIC <i>fpc-slot</i> in FPC <i>pic-type</i> (PIC type <i>version</i>) is not supported
Description	The chassis process (chassisd) did not bring the indicated Physical Interface Card (PIC) online, because its hardware version is not supported.
Type	Error: An error occurred
Severity	warning
Facility	LOG_DAEMON
Cause	The PIC requires a hardware upgrade.
Action	Contact your technical support representative.

CHASSISD_PIDFILE_OPEN

System Log Message	Unable to open PID file ' <i>filename</i> ': <i>errno error-code</i>
Description	The chassis process (chassisd) could not open the file where it stores its process ID (PID).
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Cause	The chassisd process might have detected that another chassisd process was running and tried to read the file so that it could use the PID recorded there when terminating the other process.

CHASSISD_POWER_CHECK

System Log Message	<i>fru-name fru-slot</i> not powering up
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Description The chassis process (chassisd) could not power up the indicated component (field-replaceable unit, or FRU), because the FRU did not respond.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18837>.

CHASSISD_POWER_EVENT

System Log Message Unable to turn off power to *fru-name fru-slot*; a stand-alone test jumper might be installed

Description The chassis process (chassisd) could not turn off power to the indicated component (field-replaceable unit, or FRU).

Type Event: This message reports an event, not an error

Severity warning

Facility LOG_DAEMON

Cause A common reason is that a standalone test jumper is installed.

CHASSISD_POWER_ON_CHECK_FAILURE

System Log Message *fru-name-fru-slot* is already powered on, no need to re-power

Description The chassis process (chassisd) is getting a power- not-on status for a FRU (field-replaceable unit) that is already powered on.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Cause This could be due to bad hardware or communication failure between hardware and software.

CHASSISD_POWER_RATINGS_EXCEEDED

System Log Message PIM/module in slot *fru-slot* left offline to avoid exceeding chassis power ratings

Description The chassis process (chassisd) did not bring online the component (field-replaceable unit, or FRU) in the indicated slot, because doing so causes the total power demand of components in the chassis to exceed the chassis' power ratings. On a J-series Services Router, the component is a Physical Interface Module (PIM) or other module that installs in a PIM slot.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_PSD_RELEASE_MASTERSHIP

System Log Message Backup Routing Engine became master, because JUNOS version of former master did not match RSD master

Description The chassis process (chassisd) running on the master Routing Engine on a System-Domain routing node relinquished mastership to the backup Routing Engine in the PSD.

Type Event: This message reports an event, not an error

Severity notice

Facility LOG_DAEMON

Cause The version of the JUNOS software on the master Routing Engine did not match the version on the RSD platform's master Routing Engine. The version on the backup Routing Engine did match the RSD platform.

CHASSISD_PSM_NOT_OK

System Log Message *error-message* for PDU *pdu-slot* PSM *psm-slot* (status bits: *0xstatus-code*)

Description The chassis process (chassisd) detected the indicated error condition for the indicated power supply module (PSM).

Type Event: This message reports an event, not an error

Severity warning

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_PSM_NOT_OK_1

System Log Message *error-message* for PSM *psm-slot* (status bits: *0xstatus-code*)

Description The chassis process (chassisd) detected the indicated error condition for the indicated power supply module (PSM).

Type Event: This message reports an event, not an error

Severity warning

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_PSM_TRIP

System Log Message Power supply module *psm-slot* tripped

Description The indicated power supply module (PSM) was tripped.

Type Event: This message reports an event, not an error

Severity warning

Facility LOG_DAEMON

CHASSISD_PSU_ERROR

System Log Message *error-message* power supply *pem-slot* (status bits: *0xstatus-code*); status failure

Description The chassis process (chassisd) detected the indicated error condition for the indicated power supply unit (PSU).

Type Event: This message reports an event, not an error

Severity warning

Facility LOG_DAEMON

Action For more information, see
<http://kb.juniper.net/InfoCenter/index?page=content&id=KB18838>.

CHASSISD_PSU_FAN_FAIL

System Log Message Fan Fail for power supply *pem-slot*

Description PSU Fan fail bit is set in the status for the indicated power supply unit (PSU)

Type Error: An error occurred

Severity warning

Facility LOG_DAEMON

Action For more information, see
<http://kb.juniper.net/InfoCenter/index?page=content&id=KB18839>.

CHASSISD_PSU_INPUT_BAD

System Log Message *error-message* power supply *pem-slot* (status bits: *0xstatus-code*); Input failure

Description The chassis process (chassisd) detected the input voltage/warning fault condition for the indicated power supply unit (PSU).

Type Event: This message reports an event, not an error

Severity warning

Facility LOG_DAEMON

Action Check the status of the input connections. For more information, see
<http://kb.juniper.net/InfoCenter/index?page=content&id=KB18840>.

CHASSISD_PSU_OVERLOAD

System Log Message	Overload condition for power supply <i>pem-slot</i> (status bits: <i>0xstatus-code</i>);
Description	The indicated power supply unit (PSU) reported an output voltage overload condition.
Type	Event: This message reports an event, not an error
Severity	warning
Facility	LOG_DAEMON
Cause	There might have been excessive load on the PSU.
Action	For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18841 .

CHASSISD_PSU_TEMPERATURE

System Log Message	Temperature check bit set for power supply <i>pem-slot</i> ; airflow might be inadequate
Description	The chassis process (chassisd) detected that the 'temperature check bit' was set in the status bit mask for the indicated power supply unit (PSU).
Type	Event: This message reports an event, not an error
Severity	warning
Facility	LOG_DAEMON
Cause	The PSU might have exceeded its temperature threshold, possibly because the airflow through it was inadequate.
Action	For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18842 .

CHASSISD_PSU_VOLTAGE

System Log Message	Power supply <i>pem-slot</i> reports problem; check output voltage
Description	The indicated power supply unit (PSU) reported a problem with its output voltage.
Type	Event: This message reports an event, not an error
Severity	warning
Facility	LOG_DAEMON
Cause	There might have been excessive load on the PSU.
Action	For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18843 .

CHASSISD_RANGE_CHECK

System Log Message	<i>function-name</i> : '0xvalue' is invalid value for <i>object-name</i> (out of range)
Description	The indicated value was outside the valid range of values for the indicated object.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_RECONNECT_SUCCESSFUL

System Log Message	Successfully reconnected on soft restart
Description	The chassis process (chassisd) successfully reconnected with each Packet Forwarding Engine after a soft restart.
Type	Event: This message reports an event, not an error
Severity	notice
Facility	LOG_DAEMON

CHASSISD_RELEASE_MASTERSHIP

System Log Message	Release mastership notification
Description	The chassis process (chassisd) running on the master Routing Engine received a request to release mastership.
Type	Event: This message reports an event, not an error
Severity	info
Facility	LOG_DAEMON
Cause	The Routing Engine was probably rebooting and graceful Routing Engine switchover is configured.

CHASSISD_RE_CONSOLE_FE_STORM

System Log Message	Console device encountering framing error storm on Routing Engine <i>routing-engine-slot</i> (possibly a bad console cable)
Description	At least one console device on the Routing Engine has encountered excessive framing errors. This can be indicative of a bad cable connected to the device (especially true in the case of a serial console port.)
Type	Error: An error occurred
Severity	error

Facility LOG_DAEMON

CHASSISD_RE_CONSOLE_ME_STORM

System Log Message Console device encountering modem error storm on Routing Engine *routing-engine-slot* (possibly a bad console cable)

Description At least one console device on the Routing Engine has encountered excessive modem errors. This can be indicative of a bad cable connected to the device (especially in the case of a serial console port).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_RE_INIT_INVALID_RE_SLOT

System Log Message re_init: re *routing-engine-slot*, out of range

Description The chassis process (chassisd) could not initialize a Routing Engine because the slot number specified for it was invalid.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_RE_OVER_TEMP_CONDITION

System Log Message Routing Engine *routing-engine-slot* temperature (*temperature* C) over *threshold* degrees C

Description The temperature of the indicated Routing Engine exceeded the indicated temperature, which is the upper of two thresholds.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Increase cooling in the area around the chassis. For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18844>.

CHASSISD_RE_OVER_TEMP_SHUTDOWN

System Log Message Routing Engine *routing-engine-slot* temperature above *threshold* degrees C for too long; *action*

Description The chassis process (chassisd) performed the indicated action because the temperature of the indicated Routing Engine exceeded the maximum threshold for more than four minutes. Continued operation at the excessive temperature could damage routing platform components.

Type	Error: An error occurred
Severity	critical
Facility	LOG_DAEMON
Action	Increase cooling in the area around the chassis. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18845 .

CHASSISD_RE_OVER_TEMP_WARNING

System Log Message Routing Engine *routing-engine-slot* temperature (*temperature* C) over *threshold* degrees C, *component* will shutdown in *duration* seconds if condition persists

Description The temperature of the indicated Routing Engine exceeded the indicated temperature, which is the upper of two thresholds. If the temperature does not go below the threshold within four minutes after the chassis process (chassisd) detects this condition, the chassisd process shuts down the indicated component. When this message was logged, the indicated number of seconds remained before shutdown.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Increase cooling in the area around the chassis. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18846 .

CHASSISD_RE_WARM_TEMP_CONDITION

System Log Message Routing Engine *routing-engine-slot* temperature (*temperature* C) is above warm temperature limit (*threshold* C)

Description The temperature of the indicated Routing Engine exceeded the indicated temperature, which is the lower of two thresholds.

Type	Event: This message reports an event, not an error
Severity	error
Facility	LOG_DAEMON
Action	Increase cooling in the area around the chassis.

CHASSISD_ROOT_MOUNT_ERROR

System Log Message Unable to determine the mount point for root directory: *error-message*

Description The chassis process (chassisd) could not determine the mount point for the root file system.

Type	Error: An error occurred
Severity	error

Facility LOG_DAEMON

CHASSISD_RTS_SEQ_ERROR

System Log Message ifmsg sequence gap *expected-value - received-value*

Description The chassis process (chassisd) received a routing socket message out of order.

Type Event: This message reports an event, not an error

Severity warning

Facility LOG_DAEMON

Cause A routing socket message was lost because of excessive load or lack of memory.

CHASSISD_SBOARD_VERSION_MISMATCH

System Log Message Version mismatch: chassisd message version *expected-value fru-name* message version *received-value* local IPC version *local-ipc-version* remote IPC version *remote-ipc-version*

Description The chassis process (chassisd) verifies that it supports the revision level or version of a component (field-replaceable unit, or FRU). The revision level for the indicated FRU was unsupported or otherwise invalid.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Cause Either a previous software upgrade did not complete successfully, or the chassisd process or FRU did not restart after a successful software upgrade.

Action Upgrade the software and reboot the routing platform.

CHASSISD_SENSOR_RANGE_NOTICE

System Log Message *fru-name fru-slot* temperature is *temperature* degrees C, which is outside operating range

Description The temperature sensor on the indicated component (field-replaceable unit, or FRU) reported the indicated temperature, which is outside the acceptable operating range.

Type Event: This message reports an event, not an error

Severity warning

Facility LOG_DAEMON

Cause Some sensors generate erroneous readings when a FRU starts up. When this happens, the chassis process (chassisd) rereads the sensor at a later time.

CHASSISD_SERIAL_ID

System Log Message Serial ID read error: *error-code -- error-message*

Description The chassis process (chassisd) could not obtain the Routing Engine's serial number from the kernel because of the indicated error.

Type Error: An error occurred

Severity warning

Facility LOG_DAEMON

CHASSISD_SFC_FPM_CHCFG_WARNING

System Log Message SFC Front Panel craft interface setting is changed : Chassis Number *Oxold-index* -> *Oxindex*, Config Size *Oxold-size* -> *Oxsize*

Description SFC Front Panel Dial Switches Chassis Number and Config Size are changed. Chassis Number setting change is ignored. Config Size setting change affects the SFC operation mode on next reboot.

Type Event: This message reports an event, not an error

Severity warning

Facility LOG_DAEMON

Action If the changes were accidental, return the dial to the correct settings before the next reboot. If the changes were intended, make sure the right hardware configuration is present.

CHASSISD_SFM_MODE_ERROR

System Log Message *function-name: error-message*

Description The chassis process could not configure a requested operational mode for a Switching and Forwarding Module (SFM), for the indicated reason.

Type Error: An error occurred

Severity info

Facility LOG_DAEMON

Cause Possible reasons include (a) the requested mode is available only with certain versions of an application-specific integrated circuit (ASIC) (b) not all SFMs are online as required by the requested mode (c) cross-connect mode cannot be configured if an OC-192c Physical Interface Card (PIC) is installed.

CHASSISD_SFM_NOT_ONLINE

System Log Message *function-name: SFM sfm-slot* not online

Description The indicated Switching and Forwarding Module (SFM) was offline.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_SHUTDOWN_NOTICE

System Log Message Shutdown reason: *reason*

Description Although the chassis process (chassisd) normally does not exit or shut down except when the Routing Engine reboots, it shut down for the indicated reason.

Type Event: This message reports an event, not an error

Severity warning

Facility LOG_DAEMON

CHASSISD_SIB_INVALID_SLOT

System Log Message *fru-name* in invalid slot *slot*

Description The chassis process (chassisd) detected the presence of the switch interface board (SIB) in an invalid slot. The SIB remains offline.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18848>.

CHASSISD_SIGPIPE

System Log Message SIGPIPE received

Description The chassis process (chassisd) received a signal indicating that its attempt to write to a pipe failed because the reader (which could be another process or thread) did not exist.

Type Event: This message reports an event, not an error

Severity info

Facility LOG_DAEMON

Cause The entity at the other end of the pipe exited or closed the connection.

CHASSISD_SMB_ERROR

System Log Message smb_read: fpga download not complete: val *return-value*, *action*

Description The system management bus (SMB) could not download field-programmable gate array (FPGA) information and returned the indicated status code. The chassis process (chassisd) took the indicated action.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

CHASSISD_SMB_INVALID_PS

System Log Message *function-name: invalid power supply status code (0xstatus-code)*

Description The chassis process (chassisd) could not set the status (enabled or disabled) for a power supply, because it received the indicated power supply status code, which is invalid.

Type Error: An error occurred

Severity critical

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18849>.

CHASSISD_SMB_IOCTL_FAILURE

System Log Message *function-name: 'operation' ioctl failed on system management bus (address 0xmemory-address, cmd 0xcommand)*

Description The indicated ioctl() operation failed at the indicated address on the system management bus (SMB).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18850>.

CHASSISD_SMB_READ_FAILURE

System Log Message *function-name: read() failed on system management bus (address 0xmemory-address)*

Description A read() operation failed at the indicated address on the system management bus (SMB).

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative. For more information, see <http://kb.juniper.net/InfoCenter/index?page=content&id=KB18851>.

CHASSISD_SNMP_TRAP1

System Log Message	SNMP trap generated: <i>trap (argument1 value1)</i>
Description	The chassisd process (chassisd) generated the indicated simple network management protocol (snmp) trap with the indicated value.
Type	Event: This message reports an event, not an error
Severity	notice
Facility	LOG_DAEMON

CHASSISD_SNMP_TRAP10

System Log Message	SNMP trap generated: <i>trap (argument1 value1, argument2 value2, argument3 value3, argument4 value4, argument5 value5, argument6 value6, argument7 value7, argument8 value8, argument9 value9, argument10 value10)</i>
Description	The chassis process (chassisd) generated a Simple Network Management Protocol (SNMP) trap with the ten indicated argument-value pairs.
Type	Event: This message reports an event, not an error
Severity	notice
Facility	LOG_DAEMON

CHASSISD_SNMP_TRAP3

System Log Message	ENTITY trap generated: <i>trap (argument1 value1, argument2 value2, argument3 value3)</i>
Description	The chassisd process (chassisd) generated the indicated simple network management protocol (snmp) trap with the three indicated argument-value pairs.
Type	Event: This message reports an event, not an error
Severity	notice
Facility	LOG_DAEMON

CHASSISD_SNMP_TRAP6

System Log Message	SNMP trap generated: <i>trap (argument1 value1, argument2 value2, argument3 value3, argument4 value4, argument5 value5, argument6 value6)</i>
Description	The chassis process (chassisd) generated a Simple Network Management Protocol (SNMP) trap with the six indicated argument-value pairs.
Type	Event: This message reports an event, not an error
Severity	notice
Facility	LOG_DAEMON

CHASSISD_SNMP_TRAP7

System Log Message	SNMP trap generated: <i>trap (argument1 value1, argument2 value2, argument3 value3, argument4 value4, argument5 value5, argument6 value6, argument7 value7)</i>
Description	The chassis process (chassisd) generated a Simple Network Management Protocol (SNMP) trap with the seven indicated argument-value pairs.
Type	Event: This message reports an event, not an error
Severity	notice
Facility	LOG_DAEMON

CHASSISD_SPI_IOCTL_FAILURE

System Log Message	<i>function-name: reason 0xaddress, error error-message</i>
Description	The chassis process (chassisd) could not perform the indicated ioctl() operation on the indicated register of the spi device.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_SPMB_RESTART

System Log Message	SPMB <i>slot</i> restarted
Description	The indicated Switch Processor Mezzanine Board (SPMB) restarted.
Type	Event: This message reports an event, not an error
Severity	info
Facility	LOG_DAEMON

CHASSISD_SPMB_RESTART_TIMEOUT

System Log Message	Attempt <i>count</i> to restart SPMB <i>slot</i> timed out; <i>action</i>
Description	The chassis process (chassisd) tried the indicated number of times to bring the indicated Switch Processor Mezzanine Board (SPMB) online. The chassisd process performed the indicated action as a result of the failure.
Type	Event: This message reports an event, not an error
Severity	error
Facility	LOG_DAEMON

CHASSISD_SSB_FAILOVERS

System Log Message	<i>fru-name</i> failover occurred <i>count</i> times
Description	The indicated packet-switching component or control board failed over to a redundant neighbor the indicated number of times, which exceeds the maximum limit.
Type	Event: This message reports an event, not an error
Severity	warning
Facility	LOG_DAEMON
Cause	There is probably a system error.
Action	Contact your technical support representative.

CHASSISD_STANDALONE_FPC_NOTICE

System Log Message	chassisd running in standalone FPC mode <i>mode</i>
Description	The chassis process (chassisd) was running in the indicated standalone Flexible PIC Concentrator (FPC) mode. This message was logged in case the administrator wants it to run in a different mode.
Type	Event: This message reports an event, not an error
Severity	warning
Facility	LOG_DAEMON

CHASSISD_SYSCTL_ERROR

System Log Message	<i>function-name: sysctl-error</i> error from <i>sysctl-function-name: error-message</i> (errno <i>error-code</i>)
Description	The chassis process (chassisd) received the indicated error from the indicated sysctl() operation.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON

CHASSISD_TEMP_HOT_NOTICE

System Log Message	<i>fru-name</i> temperature of <i>temperature</i> degrees C is above limit (<i>threshold</i> degrees)
Description	The temperature of the chassis, or of the indicated component (field-replaceable unit, or FRU), exceeded the lower of two thresholds. The chassis process (chassisd) increased the speed of all functioning fans (and impellers, if applicable) to full speed. If the temperature did not decrease below the threshold within 4 minutes after this message was logged, the chassisd process shut down the routing platform.

Type	Event: This message reports an event, not an error
Severity	error
Facility	LOG_DAEMON
Action	Increase cooling in the area around the chassis.

CHASSISD_TEMP_SENSOR_FAILURE

System Log Message *function-name: unable to read temperature sensor for fru-name*

Description The temperature sensor for the indicated component (field-replaceable unit, or FRU) either did not respond to a request from the chassis process (chassisd) for a temperature reading or sent a value that is outside the normal operating range.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18852 .

CHASSISD_TERM_SIGNAL

System Log Message Received SIGTERM request, shutting down

Description The chassis process (chassisd) received the SIGTERM signal, indicating that it should terminate. It began the procedure for clean shutdown and exit, but possibly restarted automatically after exiting.

Type	Event: This message reports an event, not an error
Severity	info
Facility	LOG_DAEMON

CHASSISD_TIMER_CLR_ERR

System Log Message *function-name: message*

Description The chassis process (chassisd) could not clear the state of the timer it had set to track the timeout period for an event.

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON

CHASSISD_TIMER_ERR

System Log Message Unable to schedule timeout for *description*

Description The chassis process (chassisd) could not start a timer to track the timeout period for the indicated event. The seriousness of this error depends on the event.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_TIMER_VAL_ERR

System Log Message Null timer ID

Description The chassis process (chassisd) started a timer to track the timeout period for an event. The timer returned a null identifier, so the chassisd process could not clear the timer.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action For more information, see
<http://kb.juniper.net/InfoCenter/index?page=content&id=KB18853>.

CHASSISD_UNEXPECTED_EXIT

System Log Message evMainLoop returned *return-value* (errno error-code)

Description The chassis process (chassisd) exited unexpectedly and reported the indicated error.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Action For more information, see
<http://kb.juniper.net/InfoCenter/index?page=content&id=KB18854>.

CHASSISD_UNEXPECTED_VALUE

System Log Message *function-name*: 'value' is invalid value for *object-name*

Description The indicated value was specified for the indicated object in a message received by the chassis process (chassisd). The value is invalid for that type of object.

Type Error: An error occurred

Severity warning

Facility LOG_DAEMON

Action Contact your technical support representative.

CHASSISD_UNSUPPORTED_FPC

System Log Message	FPC with I2C ID of <i>0xi2c-id</i> is not supported
Description	A Flexible PIC Concentrator (FPC) of the indicated type was installed in the routing platform. The software does not support that FPC type on this platform.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_UNSUPPORTED_MODEL

System Log Message	Model <i>model</i> unsupported with this version of chassisd
Description	The version of the chassis process (chassisd) software that is installed on the routing platform does not support this type of chassis.
Type	Error: An error occurred
Severity	warning
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_UNSUPPORTED_PIC

System Log Message	PIC <i>pic-slot</i> in FPC <i>fpc-slot</i> (type <i>pic-type</i> , version <i>version</i>) is not supported
Description	The indicated Physical Interface Card (PIC) is either not supported on this routing platform or is not supported by the installed version of the chassis process (chassisd) software. The chassisd process did not bring the PIC online.
Type	Error: An error occurred
Severity	warning
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_UNSUPPORTED_PIC_MODE

System Log Message	Application mode <i>mode</i> is not supported for PIC <i>pic-slot</i> in FPC <i>fpc-slot</i>
Description	The indicated Physical Interface Card (PIC) does not support the indicated application mode configured for it.
Type	Event: This message reports an event, not an error

Severity	warning
Facility	LOG_DAEMON
Action	Check which application modes are supported for the PIC.

CHASSISD_UNSUPPORTED_SIB

System Log Message	SIB with assembly ID <i>assembly-id</i> is not supported <i>reason</i>
Description	The chassis process (chassisd) detected the presence of a new Switch Interface Board (SIB) with the indicated assembly ID. The SIB remains offline, because it is not a supported type.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_VCHASSIS_CONVERT_ERROR

System Log Message	<i>function-name: fpc-slot/pic-slot/port</i> conversion timeout; type <i>type-string</i>
Description	The chassis process (chassisd) timed out awaiting notification from an fpc that an interface being converted to or from a vc-port was deleted.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON

CHASSISD_VCHASSIS_LICENSE_ERROR

System Log Message	Virtual Chassis License not installed
Description	A virtual-chassis operational mode command was executed without a valid virtual chassis license being installed.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON

CHASSISD_VCHASSIS_MEMBER_LIST_NOTICE

System Log Message	Members: <i>member-list</i>
Description	List of virtual-chassis members
Type	Event: This message reports an event, not an error
Severity	notice

Facility LOG_DAEMON

CHASSISD_VCHASSIS_MEMBER_OP_NOTICE

System Log Message Member change: *vc operation of member member-id*

Description The change being made to the member

Type Event: This message reports an event, not an error

Severity notice

Facility LOG_DAEMON

CHASSISD_VCHASSIS_MEMBER_UPDATE_NOTICE

System Log Message Membership update: Member *old-member-id->member-id*, Mode *old-member-mode->member-mode*, *master-member-idM backup-member-idB*, Master *master-change*, Members *members-change*

Description A virtual-chassis membership change is being reported

Type Event: This message reports an event, not an error

Severity notice

Facility LOG_DAEMON

CHASSISD_VERSION_MISMATCH

System Log Message Version mismatch: chassisd message version *expected-value fru-name fru-slot* message version *received-value* local IPC version *local-ipc-version* remote IPC version *remote-ipc-version*

Description As a component (field-replaceable unit, or FRU) comes online, the chassis process (chassisd) verifies that the FRU's revision level or version is supported. The revision level of the indicated FRU was unsupported or otherwise invalid.

Type Error: An error occurred

Severity error

Facility LOG_DAEMON

Cause Either a previous software upgrade did not complete successfully, or the chassisd process or FRU did not restart after a successful software upgrade.

Action Upgrade the software and reboot the routing platform.

CHASSISD_VOLTAGE_READ_FAILED

System Log Message Unable to read voltage from *fru-name* (group *group-id*, address *address*, channel *voltage-channel*)

Description The chassis process (chassisd) could not read voltage data from the indicated component (field-replaceable unit, or FRU).

Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative. For more information, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB18855 .

CHASSISD_VOLTAGE_SENSOR_INIT

System Log Message	Unable to initialize voltage sensor for <i>fru-name</i> (group <i>group-id</i> , address <i>address</i>)
Description	The chassis process (chassisd) could not initialize the voltage sensor for the indicated component (field-replaceable unit, for FRU).
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON
Action	Contact your technical support representative.

CHASSISD_VSERIES_LICENSE_ERROR

System Log Message	CHASSISD_VSERIES_LICENSE_ERROR: <i>error-message</i>
Description	A virtual Appliance Operational Command was executed without a valid virtual appliance license being installed.
Type	Error: An error occurred
Severity	error
Facility	LOG_DAEMON

CHASSISD_ZONE_BLOWERS_SPEED

System Log Message	Fans and impellers in zone <i>zone</i> are now running at normal speed
Description	The fans (and impellers, if applicable) in zone were running at the normal speed.
Type	Event: This message reports an event, not an error
Severity	notice
Facility	LOG_DAEMON

CHASSISD_ZONE_BLOWERS_SPEED_FULL

System Log Message	Fans and impellers in zone <i>zone</i> being set to full speed [<i>reason</i>]
Description	For the indicated reason, the chassis process (chassisd) increased the speed of fans (and impellers, if applicable) in zone to the maximum.
Type	Event: This message reports an event, not an error

Severity notice

Facility LOG_DAEMON

CHASSISD_ZONE_BLOWERS_SPEED_OFF

System Log Message Fans and impellers in zone *zone* being set to off [*reason*]

Description The fans (and impellers, if applicable) in zone were off.

Type Event: This message reports an event, not an error

Severity notice

Facility LOG_DAEMON

Chassis Alarms

Table 10 on page 137 lists the chassis-related alarms that are displayed when you execute the **show chassis alarms** operational mode command on PTX and MX Series routers.

Table 10: Chassis Alarms

Message displayed in the output of show chassis alarms Command	Description	Class	Solution
Mix of PDUs (PTX5000)	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.
Power Manager Non Operational (PTX5000)	Appears when zoning and non- zoning PDUs are installed.	Minor	Install same type of PDUs in all slots.
No Redundant Power (PTX5000)	When backup PDUs are absent or down	Minor	Install backup PDU.
PDU O/I Converter Failed (PTX5000)	Appears when one or more 36V booster converter fails in PDU (PDU2-PTX-DC).	Major	Check PDU and replace if required.
No redundant power for system (PTX5000)	Appears when there is no backup PDUs in the router	Minor	Install backup PDU.
No Power for System (PTX5000)	Appears when the router is powered on with only one PSM.	Major	Install backup PDU.
SIB1 FPC Link Error (PTX5000)	Appears when the indicated SIB is down.	Minor	Replace faulty SIB.
SIB1 Absent (PTX5000)	Appears when the indicated SIB is absent.	Major	Replace faulty SIB.

Table 10: Chassis Alarms (*continued*)

Message displayed in the output of show chassis alarms Command	Description	Class	Solution
PDU 1 PSM 1 Not OK (PTX5000)	Appears when the PSM in the displayed PDU is down.	Major	Replace faulty PSM.
Host x disk drive y smart error	Appears when the Routing Engine is corrupted and unable to launch the guest. <ul style="list-style-type: none">• x=0 for Host 0 (RE 0) and 1 for Host 1 (RE 1)• y=1 for SSD 1 and 2 for SSD2	Minor	Recover the disk by using request vmhost snapshot command.

Related Documentation • [show chassis alarms on page 780](#)

CHAPTER 2

Router Chassis Clocking and Synchronization Configuration Overview

- [Centralized Clocking Overview on page 140](#)
- [Ethernet Synchronization Message Channel Overview on page 145](#)
- [Getting Started Configuring Clock Synchronization on PTX Series Routers on page 146](#)
- [Interface and Router Clock Sources Overview on page 147](#)
- [Synchronous Ethernet Overview on page 149](#)
- [Synchronous Ethernet on 10-Gigabit Ethernet MIC Overview on page 157](#)
- [Ethernet Synchronization Message Channel Overview on page 161](#)
- [Precision Time Protocol Overview on page 163](#)
- [Understanding Clock Synchronization on page 167](#)
- [Understanding ESMC Quality Level Mapping on page 183](#)
- [PTP Trace Overview on page 187](#)
- [Understanding Hybrid Mode on page 191](#)

Centralized Clocking Overview

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 *MX960 SCBE2 Description* and *MX960 SCBE2 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 141](#)
- [BITS and GPS Support on page 141](#)
- [External Clock Interface Input on page 142](#)
- [External Clock Interface Output on page 143](#)
- [Redundancy on page 144](#)

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 11 on page 141](#) maps the Junos OS Release with the feature release of BITS and GPS on SCBE and SCBE2:

Table 11: 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 142](#)
- [External Clock Interface Input for GPS on page 142](#)

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.

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 1 on page 143](#) illustrates the actual pinout of the connector.

Figure 1: RJ-45 Connector for SCBE/SCBE2

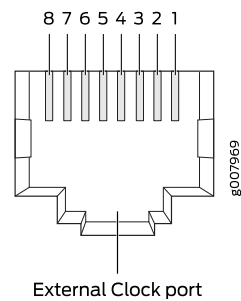


Table 12: RJ-45 Connector Pinout Information for SBE/SCBE2

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.

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.

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.

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.

Related Documentation

- [Configuring Clock Synchronization Interface on MX Series Routers on page 353](#)
- [Example: Configuring Synchronous Ethernet on MX Series Routers on page 368](#)
- [Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 372](#)
- [request chassis synchronization mode on page 766](#)
- [show chassis synchronization \(MX Series Routers\) on page 1678](#)
- [synchronization on page 672](#)
- [Understanding Clock Synchronization on page 167](#)

Ethernet Synchronization Message Channel Overview

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.

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 353](#).

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.

Related Documentation

- [Synchronous Ethernet Overview on page 149](#)
- [Configuring Clock Synchronization Interface on MX Series Routers on page 353](#)
- [Clock Sources for PTX Series Packet Transport Routers on page 363](#)
- [synchronization \(MX Series\) on page 672](#)
- [synchronization \(PTX Series\) on page 680](#)
- [request chassis synchronization mode on page 766](#)
- [show chassis synchronization on page 1673](#)
- [show chassis synchronization \(MX Series Routers\) on page 1678](#)

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 13 on page 147](#).

Table 13: 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.	"Synchronizing Internal Stratum 3 Clock to External Clock Sources on PTX Series Routers" on page 365 synchronization (PTX Series)
Identify clock sources.	"Clock Sources for PTX Series Packet Transport Routers" on page 363
Change the clock source.	request chassis synchronization switch
Configure the clock source mode to be revertive or non revertive.	switchover-mode
Verify the clock source is operational.	show chassis synchronization

Related Documentation

- [PTX5000 Centralized Clock Generator Description](#)
- [Connecting the PTX5000 Packet Transport Router to an External Clocking Device](#)
- [Understanding Clock Synchronization on page 167](#)

Interface and Router Clock Sources Overview

- [Interface and Router Clock Sources Description on page 147](#)
- [Configuring an External Synchronization Interface on page 148](#)

Interface and Router Clock Sources Description

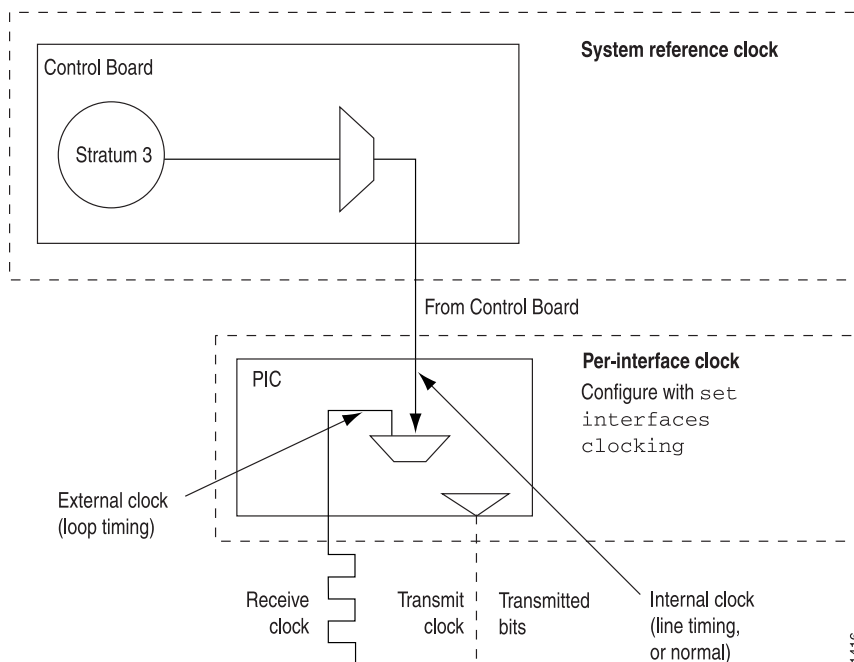
When configuring the router, you can configure the *transmit clock* on each interface; the transmit clock aligns each outgoing packet transmitted over the router's interfaces. For both the router and interfaces, the clock source can be the router's internal Stratum 3 clock, which resides on the control 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 2 on page 148](#) illustrates the different clock sources on the M120 router.

Figure 2: 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 the Junos OS to Support an External Clock Synchronization Interface for M Series and T Series Routers”](#) on page 351.

Related Documentation

- [Configuring the Junos OS to Support an External Clock Synchronization Interface for M Series and T Series Routers](#) on page 351
- [Synchronous Ethernet Overview](#) on page 149
- [Configuring Clock Synchronization Interface on MX Series Routers](#) on page 353

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 149](#)
- [Supported Platforms on page 150](#)
- [Understanding Clock Synchronization on page 153](#)
- [Understanding Ingress Monitoring on MX Series Routers on page 153](#)
- [Understanding Distributed Clocking Mode on MX Series Routers on page 154](#)
- [Centralized Clocking Mode Overview on page 154](#)

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 3D Universal Edge routers and on the MICs and MPCEs on MX240, MX480, MX960, MX2010, and MX2020 routers.

Supported Platforms

Table 14 on page 150 summarizes the first Junos OS release that supports Synchronous Ethernet on the various Juniper Networks routers and their components:

Table 14: Synchronous Ethernet Support on Junos OS

Routers and Components	Junos OS Release
MX5, MX10, MX40, and MX80 3D Universal Edge Routers 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"> • MPC1E (MX-MPC1E-3D) • MPC1E Q (MX-MPC1E-3D-Q) • MPC2E (MX-MPC2E-3D) • MPC2E Q (MX-MPC2E-3D-Q) • MPC2E EQ (MX-MPC2E-3D-EQ) 	11.2R4
10-Gigabit Ethernet MIC with XFP in LAN-PHY framing mode	11.4
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 Access Routers with Gigabit Ethernet and 10-Gigabit Ethernet SFP and SFP+ transceivers.	12.2

Table 14: Synchronous Ethernet Support on Junos OS (*continued*)

Routers and Components		Junos OS Release
On MX240, MX480, and MX960 routers with SCBE, the following MPCs support Synchronous Ethernet:		12.3, 15.1
MPC		Junos OS Release
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
On MX2010 and MX2020 routers, the following Enhanced MPCs (MPCEs) support Synchronous Ethernet:		13.3
<ul style="list-style-type: none"> • MPC1E (MX-MPC1E-3D) • MPC1E Q (MX-MPC1E-3D-Q) • MPC2E (MX-MPC2E-3D) • MPC2E Q (MX-MPC2E-3D-Q) • MPC2E EQ (MX-MPC2E-3D-EQ) • MPC3E (MX-MPC3E-3D) 		

Table 14: Synchronous Ethernet Support on Junos OS (*continued*)

On MX240, MX480, and MX960 routers with SCBE2, on MX2010 and 13.3, 15.1
on MX2020, the following MPCs support Synchronous Ethernet:

MPC	Junos OS Release
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

On MX240, MX480, and MX960 routers with SCBE or SCBE2, on 13.3R3
MX2010 and on MX2020 routers with RE-CB, the following MPCs
support Synchronous Ethernet:

- MPC5E (MPC5E-40G10G)
- MPC5EQ (MPC5EQ-40G10G)
- MPC5E (MPC5E-100G10G)
- MPC5EQ (MPC5EQ-100G10G)
- MPC6E (MX2K-MPC6E)

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.

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.

Starting with Junos OS Release 12.2, Synchronous Ethernet is supported on Juniper Networks ACX Series Universal Access 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.

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.

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.

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 353](#) and for information about configuring these options for MX Series routers, see [“Understanding Clock Synchronization” on page 167](#).

Currently, two types of clocking modes are supported on MX Series routers, the distributing clocking mode and the centralized clocking mode. For information about distributed clocking mode, see [“Understanding Distributed Clocking Mode on MX Series Routers” on page 154](#) and [“Ethernet Synchronization Message Channel Overview” on page 145](#). For information about centralized clocking mode, see [“Centralized Clocking Mode Overview” on page 154](#) and [“Centralized Clocking Overview on MX Series Routers” on page 140](#).

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 157](#).

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 145](#).

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 that 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 MX Series Routers” on page 140](#).

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.

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.

Related Documentation

- [Clock Sources for PTX Series Packet Transport Routers on page 363](#)
- [Configuring Clock Synchronization Interface on MX Series Routers on page 353](#)
- [*Configuring External Clock Synchronization for ACX Series Routers*](#)
- [Ethernet Synchronization Message Channel Overview on page 145](#)
- [request chassis synchronization mode on page 766](#)
- [show chassis synchronization \(MX Series Routers\) on page 1678](#)
- [Synchronous Ethernet on 10-Gigabit Ethernet MIC Overview on page 157](#)
- [synchronization on page 672](#)
- [synchronization \(PTX Series\) on page 680](#)

Synchronous Ethernet on 10-Gigabit Ethernet MIC Overview

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 372](#). In this mode, the LAN frequency is directly supplied by the MIC's on-board clocking circuitry.

On MX80 3D Universal Edge Routers, 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 372](#).

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 3D Universal Edge Routers, 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 3D Universal Edge Routers, 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 372.](#)

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 15 on page 159 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 15: 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 15 on page 159 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 363](#)
- [Configuring Clock Synchronization Interface on MX Series Routers on page 353](#)
- [Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 372](#)
- [request chassis synchronization mode on page 766](#)
- [show chassis synchronization \(MX Series Routers\) on page 1678](#)
- [Synchronous Ethernet Overview on page 149](#)

- [synchronization on page 672](#)

Ethernet Synchronization Message Channel Overview

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.

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 353](#).

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.

**Related
Documentation**

- [Synchronous Ethernet Overview on page 149](#)
- [Configuring Clock Synchronization Interface on MX Series Routers on page 353](#)
- [Clock Sources for PTX Series Packet Transport Routers on page 363](#)
- [synchronization \(MX Series\) on page 672](#)
- [synchronization \(PTX Series\) on page 680](#)
- [request chassis synchronization mode on page 766](#)
- [show chassis synchronization on page 1673](#)
- [show chassis synchronization \(MX Series Routers\) on page 1678](#)

Precision Time Protocol Overview

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 future 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 149](#).

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—Also called the grandmaster clock, the master clock is located in the PTP server (also called master or master node). 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 375](#) and [“Example: Configuring Precision Time Protocol” on page 379](#).

[Table 16 on page 164](#) summarizes the first Junos OS release that supports PTP on various Juniper Networks devices:

Table 16: Precision Time Protocol Support

Juniper Networks Devices	Junos OS Release
MX80 3D Universal Edge Routers 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"> • MPC5E-40G10G on MX240, MX480, MX960, MX2010, and MX2020 routers • MPC5EQ-40G10G on MX240, MX480, MX960, MX2010, and MX2020 routers • MPC5E-100G10G on MX240, MX480, MX960, MX2010, and MX2020 routers • MPC5EQ-100G10G on MX240, MX480, MX960, MX2010, and MX2020 routers • MX2K-MPC6E on MX2010, and MX2020 routers 	13.3R3
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"> • MPC1E (MX-MPC1E-3D) • MPC1E Q (MX-MPC1E-3D-Q) • MPC2E (MX-MPC2E-3D) • MPC2E Q (MX-MPC2E-3D-Q) • MPC2E EQ (MX-MPC2E-3D-EQ) For more information about obtaining a license, contact JTAC.	12.3
ACX Series Universal Access Routers	12.2

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.
- 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.

When timestamping is configured at the nonphysical layer (also known as non-PHY timestamping) on the enhanced MPCs MPC5E and MPC6E, there is an inherent path asymmetry between the PTP master and PTP slave. To make the path delay symmetric, you must configure both port-specific and line-card-specific asymmetry values.

[Table 17 on page 165](#) summarizes the asymmetry values for MPC5E and MPC6E.

Table 17: Asymmetry Values for MPC5E and MPC6E

MPC	Asymmetry Value
MPC5E-40G10G	-1520
MPC5E-100G10G (10G port)	-1520
MPC5E-100G10G (100G port)	-1250
MX2K-MPC6E	-200

[Table 18 on page 165](#) summarizes the asymmetry values for MPC5E and MPC6E based on PTP master and PTP slave roles:

Table 18: Asymmetry Values for MPC5E and MPC6E as PTP Slave and PTP Master

PTP Slave	PTP Master			
	MPC5E-40G10G	MPC5E-100G10G (10-Gigabit Ethernet port)	MPC5E-100G10G (100-Gigabit Ethernet port)	MX2K-MPC6E
MPC5E-40G10G	0	0	-	-1320

Table 18: Asymmetry Values for MPC5E and MPC6E as PTP Slave and PTP Master (*continued*)

PTP Slave	PTP Master			
	MPC5E-40G10G	MPC5E-100G10G (10-Gigabit Ethernet port)	MPC5E-100G10G (100-Gigabit Ethernet port)	MX2K-MPC6E
MPC5E-100G10G (10-Gigabit Ethernet port)	0	0	-	-1320
MPC5E-100G10G (100-Gigabit Ethernet port)	-	-	0	-
MX2K-MPC6E	1320	1320	-	0

For instance, if you use the 10-Gigabit Ethernet port on MPC5E as a PTP slave to a PTP master with no path symmetry, you can configure the asymmetry value by using the following command:

```
set protocols ptp slave interfaces xe-4/2/0.0 unicast transport ipv4 clock-source 10.1.1.2  
local-ip-address 10.1.1.1 asymmetry -1520
```

If you use a 10-Gigabit Ethernet port on MPC5E as a PTP slave to MPC6E, you must account for path symmetry in both line cards. Therefore, in this example, you must configure the asymmetry value by using the following command:

```
set protocols ptp slave interfaces xe-4/2/0.0 unicast transport ipv4 clock-source 10.1.1.2  
local-ip-address 10.1.1.1 asymmetry -1320
```



NOTE:

- Unified in-service software upgrade (unified ISSU) is currently not supported when clock synchronization is configured for PTP on the MICs and Enhanced MPCEs 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.

Related Documentation

- [Configuring Precision Time Protocol on page 375](#)
- [Example: Configuring Precision Time Protocol on page 379](#)
- [IEEE 1588v2 Precision Timing Protocol \(PTP\) on ACX Series Universal Access Routers](#)

Understanding Clock Synchronization

MX Series routers and PTX Series 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 168](#)
- [Network Option on page 170](#)
- [Clock Mode on page 170](#)
- [Quality Mode on page 171](#)
- [Selection Mode on page 171](#)
- [Hold Interval on page 172](#)

- [Switchover Mode on page 172](#)
- [Clock Source on page 173](#)
- [ESMC Packet Transmit on page 175](#)
- [Global Wait To Restore on page 176](#)
- [Maximum Transmit Quality Level on page 176](#)
- [Interfaces with Upstream Clock Source on page 176](#)
- [External Output Interface on page 179](#)
- [Clock Synchronization Ports on page 180](#)
- [MIC-Level Framing Mode on page 182](#)

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 19 on page 169](#) explains a few scenarios that must be taken into consideration during clock selection:

Table 19: 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>

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: 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 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.

```
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**—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 20 on page 174](#) explains the quality level values.

Table 20: 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).

Table 20: Quality Levels (*continued*)

Quality Level	Description
sec	Timing quality of an SDH equipment clock (option-1 only).
smc	Clock traceable to a self-timed SONET clock (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).



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

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 as well.



NOTE: 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 177](#)
- [Pulse Per Second on page 177](#)
- [Signal Type on page 178](#)
- [T1 Interface Options on page 178](#)

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 179](#)
- [Minimum Quality on page 179](#)
- [Source Mode on page 180](#)
- [Transmit Quality Level on page 180](#)
- [Wander Filter on page 180](#)

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.

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.

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 21 on page 181](#) explains pattern-matching characters used in the TOD data string.

Table 21: 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 22 on page 181](#) 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 22: 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)
4916.45	Latitude of fix
N	N or S of longitude

Table 22: Received TOD Data String (*continued*)

Pattern	Description
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.

Related Documentation

- [Centralized Clocking Overview on MX Series Routers on page 140](#)
- [Clock Sources for PTX Series Packet Transport Routers on page 363](#)
- [Configuring Clock Synchronization Interface on MX Series Routers on page 353](#)
- [Synchronizing Internal Stratum 3 Clock to External Clock Sources on PTX Series Routers on page 365](#)
- [Ethernet Synchronization Message Channel Overview on page 145](#)
- [Example: Configuring Synchronous Ethernet on MX Series Routers on page 368](#)
- [request chassis synchronization mode on page 766](#)

- [show chassis synchronization \(MX Series Routers\) on page 1678](#)
- [synchronization \(MX Series\) on page 672](#)
- [synchronization \(PTX Series\) on page 680](#)

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 183](#)
- [Precision Time Protocol Mode on page 184](#)
- [Hybrid Mode on page 186](#)
- [Feature Mode Changes on page 186](#)

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 23 on page 184](#) 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 23 on page 184](#).

Table 23: 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

Table 23: Default Quality Level to PTP Clock-Class Mapping (*continued*)

SSM QL (Binary)	Standard Mappings Given in ITU-T G.781 Specification		PTP Clock Class
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 385](#)
- [Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 388](#)
- [Understanding Hybrid Mode on page 191](#)
- [Precision Time Protocol Overview on page 163](#)
- [Synchronous Ethernet Overview on page 149](#)

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 163.

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:

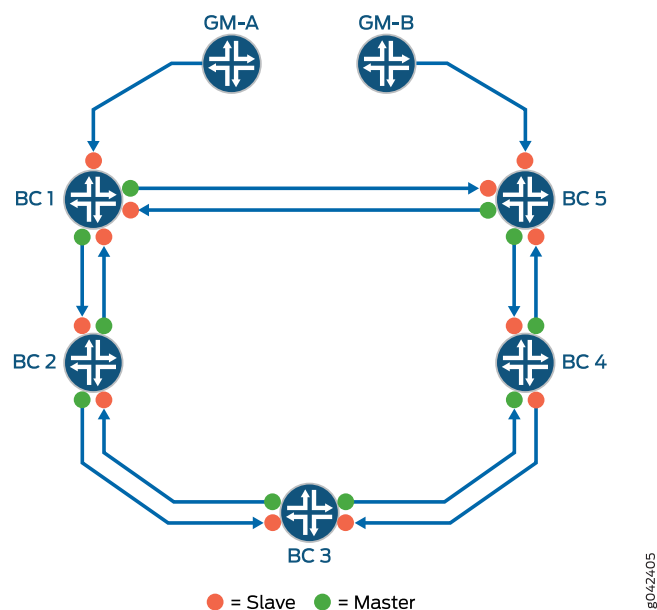
- [PTP Ring Topology on page 187](#)
- [Path Trace Mechanism Overview on page 188](#)
- [Steady State on page 189](#)
- [Failure Handling on page 189](#)
- [PTP Ring Topology Without Path Trace Mechanism on page 190](#)

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 3 on page 188](#). 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 3: 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 3 on page 188](#) 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 3 on page 188](#), 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 189](#).

Failure Handling

Consider a scenario where the router BC1 crashes in the PTP ring illustrated in [Figure 3 on page 188](#). 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 3 on page 188](#) 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.

Related Documentation

- [Precision Time Protocol Overview on page 163](#)
- [show ptp path-trace detail on page 1754](#)

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 191](#)
- [Supporting Platforms on page 192](#)

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 385](#). You can use the **show ptp hybrid status** operational command to find the current operating mode.



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.

Supporting Platforms

Hybrid mode is supported on the Juniper Networks MX240, MX480, and MX960 3D Universal Edge Routers and on the Juniper Networks MX80 3D Universal Edge Routers 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 MPC and are traceable to the same primary reference clock (PRC).

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 and MX80-T 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.

**Related
Documentation**

- [Configuring Hybrid Mode and ESMC Quality Level Mapping on page 385](#)
- [Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 388](#)
- [Precision Time Protocol Overview on page 163](#)
- [Synchronous Ethernet Overview on page 149](#)

CHAPTER 3

Router Chassis Network Services Configuration Overview

- [Network Services Mode Overview on page 195](#)
- [Restrictions on Junos OS Ethernet Network Services Mode and Enhanced Ethernet Network Services Mode Features for MX Series Routers on page 199](#)
- [Configuring MX Enhanced LAN Mode on page 200](#)
- [Configuring Enhanced LAN Mode for a Virtual Chassis on page 202](#)
- [Limiting the Maximum Number of Logical Interfaces on MX Series Routers With MS-DPCs in Enhanced IP Network Services Mode on page 203](#)

Network Services Mode Overview

You can configure network services modes on MX Series 3D Universal Edge Routers and on T4000 Core Routers with Type 5 FPCs.

- MX Series 3D Universal Edge Routers can be configured to run in IP Network Services mode, Enhanced IP Network Services mode, Ethernet Network Services mode, or Enhanced Ethernet Network Services mode. Each network services mode defines how the chassis recognizes and uses certain modules.

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*.



NOTE: You can configure only the Ethernet Network Services mode or Enhanced Ethernet Network Services mode, if your router chassis contains an MPC module that is not of the -IR-B type or the -R-B type.

- T4000 Core Routers with Type 5 FPCs can be configured to run in Enhanced Network Service mode to enable improved virtual private LAN service (VPLS) MAC address learning. For more information about using Enhanced Network Service mode for T4000 Core Routers with Type 5 FPCs, see [enhanced-mode](#).

When configuring chassis network services on the MX Series 3D Universal Edge routers, keep the following considerations in mind:

- You must configure a router chassis that has only MPC-3D-16XGE-SFPP modules installed for Ethernet Network Services mode or Enhanced Ethernet Network Services mode. If the router chassis has both MPC-3D-16XGE-SFPP and MPC-3D-16XGE-SFPP-R-B modules installed, only Ethernet Network Services mode or Enhanced Ethernet Network Services mode can be configured on the chassis.
- You can configure a router chassis with only MPC-3D-16XGE-SFPP-R-B modules installed for any network services mode. However, this configuration requires installing the appropriate license (-IR-B type or the -R-B type) if you want to use IP Network Services mode or Enhanced IP Network Services mode.
- You can configure a router chassis with only MPC4E-3D-2CGE8XGE-IR-B, MPC4E-3D-32XGE-IR-B, MPC4E-3D-2CGE8XGE-R-B, or MPC4E-3D-32XGE-R-B modules installed for any network services mode.



NOTE: The -IR-B type is applicable only for MPC4E modules.



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: Starting from Junos OS Release 13.3, you can configure the network services mode—Enhanced IP Network Services mode and Enhanced Ethernet Network Services mode—on MX240, MX480 and MX960 routers with an SCBE2 with the enhanced-ip option or the enhanced-ethernet option at the [edit chassis network-services] hierarchy level.

Table 24 on page 197 explains the different module functions when you configure the MX Series 3D Universal Edge router chassis for different network services modes.

Table 24: 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 modules are powered on.</p> <p>Starting with Junos OS Release 14.1, a router with Enhanced Ethernet Services DPCs (DPCE-X) and Enhanced Queuing Ethernet Services DPCs (DPCE-X-Q) modules is powered on by default. The default network services mode is IP Network Services mode if you do not configure a services mode on DPCE-X or DPCE-X-Q modules. Until Junos OS Release 13.3, all modules except DPCE-X and DPCE-X-Q modules are powered on, and DPCE-X or DPCE-X-Q modules are powered off by default.</p> <p>Starting in Junos OS Release 15.1, you can include the limited-ifl-scaling option with the network-services-enhanced-ip statement at the [edit chassis] hierarchy level to 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. 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.</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>NOTE: 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>
Enhanced Ethernet Network Services mode (upon boot)	<p>Only MPCs, MS-MPCs, and MS-DPCs are powered on. All restrictions for operating in Ethernet Network Services mode apply.</p> <p>NOTE: 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>
Change from IP Network Services mode to Ethernet Network Services mode	<p>DPCE-X and DPCE-X-Q modules are powered on; no reboot is required. No impact to MPCs or MS-DPCs.</p>

Table 24: Network Services Mode Functions (*continued*)

Configuration Upon Boot or Configuration Change	Module Function
Change from Ethernet Network Services mode to IP Network Services mode	Invalid modification; no commit occurs; a warning message indicating 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	Reboot required.
Change from Ethernet Network Services mode to Enhanced Ethernet Network Services mode	Reboot required.

The details of Layer 2.5 support for Ethernet Network Services mode are shown in [Table 25 on page 199](#).

Network Services on SCBE2

The following scenarios are to be noted when you are using 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 reboot 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 is displayed when the enhanced-ip or the enhanced-ethernet configuration commands are configured or deleted at the **[edit chassis network-services]** hierarchy level, which prompts you to reboot the router.


```
'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, if you configure or remove the **enhanced-ip** option 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, you must perform a 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 to avoid 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 IRB and the corresponding MAC address is learned over an LSI, the IRB will derive the Layer 2 info 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 will point to an unilist. The unilist will have all the member links to load balance the packets toward the MPLS cloud. The **enhanced-ip** option needs to be configured to enable the unicast next hop for IRB to use the unilist as the Layer 2 forwards next hop and load balance the packets.

Related Documentation

- *Firewall Filters and Enhanced Network Services Mode Overview* in the *Junos OS Broadband Subscriber Management and Services Library*.
- [Table 25 on page 199](#)
- [enhanced-mode on page 557](#)
- [network-services on page 616](#)

Restrictions on Junos OS Ethernet Network Services Mode and Enhanced Ethernet Network Services Mode Features for MX Series Routers

[Table 25 on page 199](#) lists Junos OS feature restrictions when running in Ethernet Network Services mode or Enhanced Ethernet Network Services mode.

Table 25: Restricted Software Features in Ethernet Network Services Mode

Software Feature	Restriction in Ethernet Network Services Mode
BGP	<ul style="list-style-type: none"> • Data plane support applies only to Ethernet and MPLS. • BGP only supports the following address families: inet labeled-unicast, inet unicast, inet-vpn unicast, l2vpn, and route-target.
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 ping mpls l3vpn 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.

Table 25: Restricted Software Features in Ethernet Network Services Mode (*continued*)

Software Feature	Restriction in Ethernet Network Services Mode
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 195](#)
- [Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 292](#)

Configuring MX Enhanced LAN Mode

Configuring **network-services** assumes that 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
```

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 *Getting Started with Enhanced Layer 2 Software*.

Related Documentation

- [network-services on page 616](#)
- [request system reboot](#)
- [show chassis network-services on page 1567](#)

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).

```
{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 *Getting Started with Enhanced Layer 2 Software*.

Related Documentation

- [Configuring Enhanced IP Network Services for a Virtual Chassis](#)
- [network-services on page 616](#)
- [request system reboot](#)
- [show chassis network-services on page 1567](#)

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 include the **limited-ifl-scaling** option with the **network-services enhanced-ip** statement at the **[edit chassis]** hierarchy level to 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. 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-ifl-scaling** option with the **network-services enhanced-ip** statement. When you enter the **limited-ifl-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.

Related Documentation

- [network-services on page 616](#)

CHAPTER 4

TX Matrix and TX Matrix Plus Router Configuration Overview

- [TX Matrix Router and T640 Router Configuration Overview on page 205](#)
- [TX Matrix Router Chassis and Interface Names on page 208](#)
- [TX Matrix Plus Router Configuration Overview on page 210](#)
- [TX Matrix Plus Router Chassis and Interface Names on page 214](#)

TX Matrix Router and T640 Router Configuration Overview

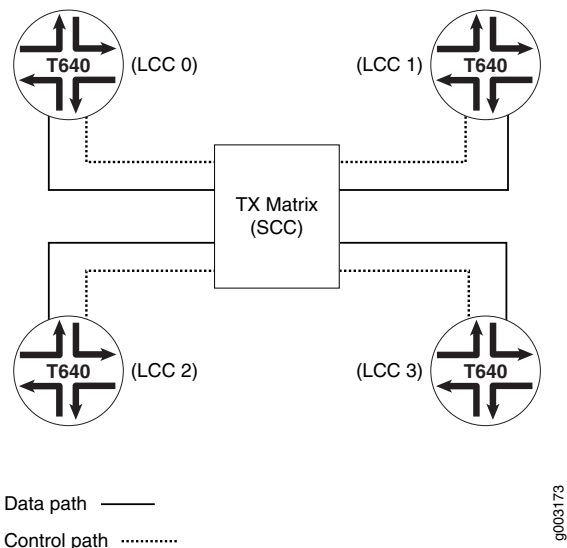
This topic provides an overview of configuring the TX Matrix router and T640 routers.

- [TX Matrix Router and T640 Router-Based Routing Matrix Overview on page 205](#)
- [Running Different Junos OS Releases on the TX Matrix Router and T640 Routers on page 206](#)
- [TX Matrix Router Software Upgrades and Reinstallation on page 207](#)
- [TX Matrix Router Rebooting Process on page 207](#)
- [Committing Configurations on the TX Matrix Router on page 207](#)
- [TX Matrix and T640 Router Configuration Groups on page 208](#)
- [Routing Matrix System Log Messages on page 208](#)

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 4 on page 206](#).

Figure 4: 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 207.

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 221](#)

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 26 on page 209](#). You can use the

converted FPC number to configure the interfaces on the TX Matrix router in your routing matrix.

Table 26: 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 221](#)

TX Matrix Plus Router Configuration Overview

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 210](#)
- [Running Different Junos OS Releases on the TX Matrix Plus Router and T1600 or T4000 Routers on page 211](#)
- [TX Matrix Plus Router Software Upgrades and Reinstallation on page 211](#)
- [TX Matrix Plus Router Rebooting Process on page 211](#)
- [TX Matrix Plus Router Routing Engine Rebooting Sequence on page 211](#)
- [TX Matrix Plus Router Management Ethernet Interfaces on page 212](#)
- [TX Matrix Plus Router Internal Ethernet Interfaces on page 212](#)
- [Routing Matrix-Based T1600 or T4000 Router Internal Ethernet Interfaces on page 212](#)
- [Committing Configurations on the TX Matrix Plus Router on page 212](#)
- [Routing Matrix Configuration Groups on page 213](#)
- [Routing Matrix System Log Messages on page 213](#)

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-FI3-3D 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 212](#).

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 237](#)
- [TX Matrix Plus Router Chassis and Interface Names on page 214](#)

- [Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 239](#)
- [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 27 on page 215](#). You can use the converted FPC number to configure the interfaces on the TX Matrix Plus router in your routing matrix.

Table 27: 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 28 on page 216](#). You can use the converted FPC number to configure the interfaces on the TX Matrix Plus router in your routing matrix.

Table 28: 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 28: 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 210](#)
- [Using the Junos OS to Configure a T1600 or T4000 Router Within a Routing Matrix on page 237](#)
- [Configuring the Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 or T4000 Router Stays Offline on page 238](#)

PART 2

Configuration

- [Configuring TX Matrix Chassis-Level Features on page 221](#)
- [Configuring TX Matrix Plus Chassis-Level Features on page 237](#)
- [Configuring M Series Chassis-Level Features on page 259](#)
- [Configuring MX Series Chassis-Level Features on page 267](#)
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- [Configuring Resynchronization of FPC Sequence Numbers when a new FPC is Brought Online on page 333](#)
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- [Configuring Chassis Settings to Support Channelized Interfaces on page 343](#)
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- [Configuring Chassis Settings to Support External Clock Synchronization on page 351](#)
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- [Configuring Chassis Setting to Support Hybrid Mode on page 385](#)
- [Configuring Chassis Settings to Support ATM Devices on page 395](#)
- [Configuring Chassis Settings for Routing Engines and Packet Forwarding Engines on page 399](#)
- [Configuring Chassis Settings for the Craft Interface on page 425](#)
- [Configuring Chassis Settings for PEMs on page 427](#)
- [Configuring Chassis Settings for Alarms on page 431](#)
- [Examples on page 473](#)
- [Configuration Statements on page 511](#)

CHAPTER 5

Configuring TX Matrix Chassis-Level Features

- [Using the Junos OS to Configure a T640 Router Within a Routing Matrix on page 221](#)
- [Configuring the Junos OS to Upgrade and Downgrade Switch Interface Boards on a TX Matrix Router on page 222](#)
- [Configuring the Junos OS to Enable the TX Matrix Router to Generate an Alarm If a T640 Router Stays Offline on page 223](#)
- [FIB Localization Overview on page 224](#)
- [Configuring FIB Localization on page 225](#)
- [Example: Configuring Packet Forwarding Engine FIB Localization on page 232](#)

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 **cel**, **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 26 on page 209](#).

For information about how to configure the **online-expected** and **offline** configuration statements, see “Configuring the Junos OS to Enable the TX Matrix Router to Generate an Alarm If a T640 Router Stays Offline” on page 223.

Related Documentation

- [TX Matrix Router and T640 Router Configuration Overview on page 205](#)
- [TX Matrix Router Chassis and Interface Names on page 208](#)
- [Configuring the Junos OS to Upgrade and Downgrade Switch Interface Boards on a TX Matrix Router on page 222](#)
- [Configuring the Junos OS to Enable the TX Matrix Router to Generate an Alarm If a T640 Router Stays Offline on page 223](#)

Configuring the 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 the Junos OS to Upgrade Switch Interface Boards on a TX Matrix Router on page 222](#)
2. [Configuring the Junos OS to Downgrade Switch Interface Boards on a TX Matrix Router on page 223](#)

Configuring the 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 the 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 205](#)
- [Using the Junos OS to Configure a T640 Router Within a Routing Matrix on page 221](#)

Configuring the 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 205](#)
- [Using the Junos OS to Configure a T640 Router Within a Routing Matrix on page 221](#)

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.

Related Documentation

- [Example: Configuring Packet Forwarding Engine FIB Localization on page 226](#)

Configuring FIB Localization

- [FIB Localization Overview on page 225](#)
- [Example: Configuring Packet Forwarding Engine FIB Localization on page 226](#)
- [Configuration Statements on page 230](#)

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.

Example: Configuring Packet Forwarding Engine FIB Localization

This example shows how to configure Packet Forwarding Engine FIB localization.

- [Requirements on page 226](#)
- [Overview on page 226](#)
- [Configuration on page 226](#)
- [Verification on page 228](#)

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 228](#)
- [Verifying FIB-Localization Configuration on page 229](#)
- [Verifying Routes After the Policy Is Applied on page 229](#)

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
>
```

Configuration Statements

- [fib-local on page 230](#)
- [fib-remote on page 231](#)
- [no-route-localize on page 231](#)
- [route-localization on page 231](#)

fib-local

Syntax fib-local;

Hierarchy Level [edit chassis fpc *fpc-number* route-localization]

Release Information Statement introduced in Junos OS Release 11.4.

Description Configure the Packet Forwarding Engine on an FPC as FIB-local.



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.

Required Privilege interface—To view this statement in the configuration.

Level interface-control—To add this statement to the configuration.

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.

no-route-localize

Syntax	no-route-localize;
Hierarchy Level	[edit policy-options policy-statement <i>policy-name</i> term <i>term-name</i> then]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Enforce installation of routes on all FIB-remote Packet Forwarding Engines.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

route-localization

Syntax	route-localization { inet; inet6; }
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure FIB localization for IPv4 and IPv6 routes.
Options	inet—Configure FIB localization for IPv4 routes. inet6—Configure FIB localization for IPv6 routes.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.

Example: Configuring Packet Forwarding Engine FIB Localization

This example shows how to configure Packet Forwarding Engine FIB localization.

- [Requirements on page 232](#)
- [Overview on page 232](#)
- [Configuration on page 232](#)
- [Verification on page 234](#)

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	<pre>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</pre>

```
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 234](#)
- [Verifying FIB-Localization Configuration on page 235](#)
- [Verifying Routes After the Policy Is Applied on page 235](#)

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 224](#)
 - [fib-local on page 230](#)
 - [fib-remote on page 231](#)
 - [no-route-localize on page 231](#)
 - [route-localization on page 231](#)

CHAPTER 6

Configuring TX Matrix Plus Chassis-Level Features

- Using the Junos OS to Configure a T1600 or T4000 Router Within a Routing Matrix on page 237
- Configuring the Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 or T4000 Router Stays Offline on page 238
- Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 239
- Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 244
- Configuring Junos OS to Upgrade a T4000 Router to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 250
- Configuring Junos OS to Upgrade the T640 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 257

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 214.

For information about how to configure the **online-expected** and **offline** configuration statements, see “Configuring the Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 or T4000 Router Stays Offline” on page 238.

Related Documentation

- [TX Matrix Plus Router Configuration Overview on page 210](#)
- [TX Matrix Plus Router Chassis and Interface Names on page 214](#)
- [Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 239](#)

Configuring the 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 210](#)
- [Using the Junos OS to Configure a T1600 or T4000 Router Within a Routing Matrix on page 237](#)
- [Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 239](#)

Configuring the 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 the Junos OS on the T1600 Router and SFC on page 240](#)
- [Configuring the Junos OS for Upgrading SIBs on the T1600 Router and Connecting It to the SFC on page 240](#)
- [Upgrading CBs and Routing Engines of the T1600 Router for Control Plane Connectivity on page 242](#)
- [Changing the Management Ethernet Interface Name for the T1600 Router on page 242](#)
- [Transferring Control of the T1600 Router \(LCC0\) to the SFC on page 242](#)
- [Adding a New T1600 Router to the TX Matrix Plus Routing Platform on page 243](#)
- [Downgrading a T1600 Router from the LCC of a TX Matrix Routing Platform to a Standalone T1600 Router on page 243](#)

Preparing the Configuration File and Upgrading the 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 the 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 242](#).
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 the Junos OS for Upgrading SIBs on the T1600 Router and Connecting It to the SFC” on page 240](#).
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 the Junos OS on the T1600 Router and SFC” on page 240](#).
 - 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.

Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs

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 244](#)
 - [Configuring Junos OS for Upgrading the SIBs on the T1600 Router and Connecting It to the SFC on page 245](#)
 - [Transferring Control of the T1600 Router \(LCC 0\) to the SFC on page 249](#)
 - [Adding a New T1600 Router to the TX Matrix Plus Routing Matrix on page 250](#)

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 245](#)
- [Preparing the SFC and the LCC for the Upgrade on page 245](#)
- [Upgrading the SIBs on page 246](#)
- [Training the Switching Plane Links on page 247](#)
- [Activating and Verifying the Switching Planes on page 249](#)

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
1cc0-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
1cc0-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 246, “Training the Switching Plane Links” on page 247, and “Activating and Verifying the Switching Planes” on page 249 for all the T1600 SIBs in the other planes.

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 242.
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 245.
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.

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 251](#)
- [Configuring Junos OS for Upgrading the SIBs on the T4000 Router and Connecting the Router to the SFC on page 251](#)
- [Transferring Control of the T4000 Router \(LCC 0\) to the SFC on page 256](#)
- [Adding a New T4000 Router to the TX Matrix Plus Routing Matrix on page 256](#)

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 251](#)
- [Preparing the SFC and the LCC for the Upgrade on page 252](#)
- [Upgrading the SIBs on page 253](#)
- [Training the Switching Plane Links on page 254](#)
- [Activating and Verifying the Switching Plane on page 255](#)

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
```

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: All the eight cables (0 through 7) on a SIB in the T4000 LCC 0 must be in **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 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 253](#), [“Training the Switching Plane Links” on page 254](#), and [“Activating and Verifying the Switching Plane” on page 255](#) for upgrading all the T4000 SIBs in the other planes.

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
```

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 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.

1. 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 251.
2. Upgrade the T4000 router with the same version of Junos OS as that on the SFC.
3. 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 251.
4. Connect Ethernet links of the control plane from the T4000 router to the SFC.

5. 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.

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 244.

Related Documentation

- [Configuring Junos OS to Upgrade a T4000 Router to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 250](#)
- [Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 244](#)
- [Upgrading an Operational Standalone Router and Integrating It into a TX Matrix Plus Routing Matrix with 3D SIBs](#)

CHAPTER 7

Configuring M Series Chassis-Level Features

- [Configuring Port-Mirroring Instances on M320 Routers on page 259](#)
- [Configuring Port-Mirroring Instances on M120 Routers on page 260](#)
- [Configuring the Junos OS to Enable MTU Path Check for a Routing Instance on M Series Routers on page 260](#)
- [Configuring the Junos OS to Enable an M160 Router to Operate in Packet Scheduling Mode on page 262](#)
- [Configuring the Junos OS to Make an SFM Stay Offline on page 262](#)
- [Configuring the Junos OS to Support FPC to FEB Connectivity on M120 Routers on page 263](#)
- [Configuring the Junos OS to Support Eight Queues on IQ Interfaces for T Series and M320 Routers on page 265](#)
- [Configuring the Junos OS to Support Entry-Level Configuration on an M320 Router with a Minimum Number of SIBs and PIMs on page 266](#)

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

- [Port-Mirroring Instances Overview on page 8](#)

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 263](#).

Related Documentation

- [Port-Mirroring Instances Overview on page 8](#)

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), and enabled for all T Series and J Series 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 261](#)
2. [Assigning an IP Address to an Interface in the Routing Instance on page 261](#)

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.

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.

Related Documentation

- [Router Chassis Configuration Statements on page 516](#)

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 the Junos OS to Support an External Clock Synchronization Interface for M Series and T Series Routers on page 351](#)
- [Configuring Port-Mirroring Instances on M120 Routers on page 260](#)

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 324](#)
 - [Configuring the Junos OS to Enable Larger Delay Buffers for T1, E1, and DS0 Interfaces Configured on Channelized IQ PICs on page 326](#)

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 259](#)
 - [Configuring the Junos OS to Support an External Clock Synchronization Interface for M Series and T Series Routers on page 351](#)
 - [Configuring the Junos OS to Support Eight Queues on IQ Interfaces for T Series and M320 Routers on page 265](#)

CHAPTER 8

Configuring MX Series Chassis-Level Features

- [Configuring Port-Mirroring Instances on MX Series 3D Universal Edge Routers on page 268](#)
- [Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 269](#)
- [16-Port 10-Gigabit Ethernet MPC on MX Series Routers \(16x10GE 3D MPC\) Overview on page 271](#)
- [Configuring the Number of Active Ports on MX Series Routers on page 271](#)
- [Configuring Tunnel Interfaces on an MX Series Router with a 16x10GE 3D MPC on page 273](#)
- [MPC3E on MX Series Routers Overview on page 274](#)
- [MPC4E on MX Series Routers Overview on page 277](#)
- [MPC5E on MX Series Routers Overview on page 279](#)
- [MPC6E on MX Series Routers Overview on page 281](#)
- [Configuring Tunnel Interfaces on MX Series Routers with the MPC3E on page 282](#)
- [Configuring Tunnel Interfaces on MX Series Routers with MPC4E on page 284](#)
- [Configuring 100-Gigabit Ethernet MICs to Interoperate with Type 4 100-Gigabit Ethernet PICs \(PD-ICE-CFP-FPC4\) Using SA Multicast Mode on page 284](#)
- [Configuring MPC4E \(MPC4E-3D-2CGE-8XGE\) to Interoperate with 100-Gigabit Ethernet PICs on Type 4 FPC Using SA Multicast Mode on page 287](#)
- [Configuring the License Mode for Specific Enhanced MPCs on MX Series Routers on page 289](#)
- [Configuring Hyper Mode on Enhanced MPCs to Speed Up Packet Processing on page 290](#)
- [Configuring Power-On Sequence for DPCs on MX Series Routers with the Enhanced AC PEM on page 291](#)
- [Configuring the Junos OS to Support Layer 2 Services on MX Series 3D Universal Edge Routers with MS-DPCs on page 291](#)
- [Configuring the Junos OS to Enable Session Offloading on MX Series 3D Universal Edge Routers with MS-DPCs on page 292](#)
- [Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 292](#)

- [Accounting of the Layer 2 Overhead Attribute in Interface Statistics on page 293](#)
- [Configuring Layer 2 Overhead Accounting in Interface Statistics on page 295](#)
- [Verifying the Accounting of Layer 2 Overhead in Interface Statistics on page 296](#)
- [Configuring Dynamic Power Management to Optimize Power Utilization for MPCs on page 298](#)
- [Disabling Dynamic Power Management on page 300](#)
- [Upgrading non-HQoS MPCs to Support Flexible Queuing on page 301](#)
- [Disabling Flexible Queuing for non-HQoS MPCs to Optimize Power Utilization on page 302](#)

Configuring Port-Mirroring Instances on MX Series 3D Universal Edge Routers

You can configure port-mirroring instances both at the DPC level and at the PIC level on MX Series routers, as described in the following topics:

- [Configuring Port-Mirroring Instances at the DPC Level on page 268](#)
- [Configuring Port-Mirroring Instances at the PIC Level on page 268](#)

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

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*.

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 473](#)
- [family on page 563](#)
- [hash-key on page 583](#)
- [inet on page 588](#)
- [multiservice on page 614](#)
- [payload on page 628](#)
- [symmetric-hash on page 669](#)

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 at 10.3125 Gbps.



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 MX Series Routers on page 271](#)
- [Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 292](#)
- [Configuring Tunnel Interfaces on MX Series Routers](#)

Configuring the Number of Active Ports on 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 271](#)

- [Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 292](#)
- [Configuring Tunnel Interfaces on MX Series Routers](#)
- [number-of-ports on page 620](#)

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 271](#)

- [Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 292](#)

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-Port Gigabit Ethernet MIC with SFPP* (model number MIC3-3D-10XGE-SFPP)
- *2-port 40-Gigabit Ethernet MIC with QSFP+* (model number MIC3-3D-2X40GE-QSFP)
- *20-port Enhanced Gigabit Ethernet MIC with SFP* (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)

The MPC3E requires the Enhanced MX Switch Control Board (SCB) 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 \(PD-1CE-CFP-FPC4\) Using SA Multicast Mode" on page 284](#).

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-QSFP
- 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).

For more information about supported Junos OS features on the MPC3E, see *Protocols and Applications Supported by the MX240, MX480, MX960, MX2010, and MX2020 MPC3E* 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 MX240, MX480, MX960, MX2010, and MX2020 MPC3E* 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.

**Related
Documentation**

- *MPC3E MIC Overview*
- *Protocols and Applications Supported by the MX240, MX480, MX960, MX2010, and MX2020 MPC3E*
- [Configuring Tunnel Interfaces on MX Series Routers with the MPC3E on page 282](#)
- [Configuring 100-Gigabit Ethernet MICs to Interoperate with Type 4 100-Gigabit Ethernet PICs \(PD-ICE-CFP-FPC4\) Using SA Multicast Mode on page 284](#)
- *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-SFPP and MPC4E-3D-2CGE-8XGE.

Type of MPC4E	Ports	Interfaces	Optical Transceiver Support	Initial Release
MPC4E-3D-32XGE-SFPP	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 287.

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.

For more information about the supported and unsupported Junos OS software features for this MPC, see *Protocols and Applications Supported by the MX240, MX480, MX960, MX2010, and MX2020 MPC4Es* 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 by the MX240, MX480, MX960, MX2010, and MX2020 MPC4Es*

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 36](#) 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 MX240, MX480, MX960, MX2010, and MX2020 MPC5Es* in the [MX Series Interface Module Reference](#).

**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 MX240, MX480, MX960, MX2010, and MX2020 MPC5Es*

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
- Unified in-service software upgrade (ISSU)
- 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 MX2010 and MX2020 MPC6E* in the *Interface Reference Module Guide*.

**Related
Documentation**

- *MPC6E*
- *10-Gigabit Ethernet OTN Options Configuration Overview*
- *100-Gigabit Ethernet OTN Options Configuration Overview*
- *Protocols and Applications Supported by the MX2010 and MX2020 MPC6E*

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.

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.

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 475](#)
- [Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 476](#)
- [Example: Configuring Tunnel Interfaces on the MPC3E on page 476](#)
- [bandwidth \(Tunnel Services\) on page 533](#)
- [tunnel-services on page 690](#)
- [\[edit chassis\] Hierarchy Level](#)

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 533](#)
- [tunnel-services on page 690](#)
- [\[edit chassis\] Hierarchy Level](#)
- [Configuring Tunnel Interfaces on MX Series Routers](#)

Configuring 100-Gigabit Ethernet MICs to Interoperate with Type 4 100-Gigabit Ethernet PICs (PD-1CE-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-1CE-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 287](#)
- [Configuring Two 50-Gigabit Ethernet Physical Interfaces on the Ethernet PIC as One Aggregated Ethernet Interface on page 288](#)

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
```

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;
  }
}
```

Related Documentation

- [*sa-multicast*](#)
- [*forwarding-mode*](#)
- [Interoperability Between MPC4E \(MPC4E-3D-2CGE-8XGE\) and 100-Gigabit Ethernet PICs on Type 4 FPC on page 18](#)

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

Configuring the license mode for enhanced MPCs, such as MPC4E, MPC5E, and MPC6E, 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 24](#)



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. 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.

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

1. Configure the license mode for the MPC in a specified MPC slot by specifying the **ir-mode mode** statement at the **[edit chassis fpc fpc-slot-number]** hierarchy level.

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

2. In configuration mode, verify the configuration.

```
user@host# show chassis fpc fpc-slot-number
pic slot-number {
  power off;
}
pic slot-number {
  power off;
}
ir-mode mode;
```

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

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

Related Documentation

- [Example: Configuring the License Mode for MPC5E on page 480](#)
- [License Modes for Enhanced MPCs Overview on page 24](#)

Configuring Hyper Mode on Enhanced MPCs to Speed Up Packet Processing

Enhanced MPCs such as MPC3E, MPC4E, MPC5E, and MPC6E 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 router to provide better performance and throughput.

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



NOTE: You can enable the hyper mode feature only if the network-service mode on the router 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 router 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 router for the configuration to take effect.

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

Related Documentation

- [Understanding the Hyper Mode Feature on Enhanced MPCs for MX Series Routers on page 25](#)
- [Unsupported Features and CLI Commands When Hyper Mode Is Enabled on page 26](#)
- `show forwarding-options hyper-mode`
- `hyper-mode (forwarding-options)`

Configuring Power-On Sequence for DPCs on MX Series Routers with the Enhanced AC PEM

MX Series routers running 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 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, include the **fru-poweron-sequence** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
fru-poweron-sequence;
```

Issue the **show chassis power** command to view power limits and usage details for the DPCs. Issue the **show chassis power sequence** command to view details on the power-on sequence for the DPCs. For more information about these commands, see the [CLI Explorer](#).

If the power-on sequence is not configured by including the **fru-poweron-sequence** statement, the Junos OS uses the ascending order of the slot numbers of the DPCs as the sequence to power-on the DPCs.

Related Documentation

- [fru-poweron-sequence on page 580](#)

Configuring the Junos OS to Support Layer 2 Services on MX Series 3D Universal Edge Routers with MS-DPCs

The Junos OS supports Layer 2 link services on MX Series 3D Universal Edge routers with MS-DPCs and MX-FPCs with non-Ethernet IQE PICs that bundle PPP links from the Type 2 channelized SONET PICs. To enable the Layer 2 service packages such as LSQ interfaces, include the **service-package layer-2** statement at the **[edit chassis fpc slot-number pic pic-number adaptive-services]** hierarchy level:

```
[edit chassis fpc slot-number pic pic-number adaptive-services]
service-package (layer-2 | layer-3);
```

Configuring the supported link services such as Multilink PPP (MLPPP), Compressed Real-Time Transport Protocol (CRTP), real-time performance monitoring (RPM) is identical to configuring these link services for a multiservices PIC. For more information about Layer 2 link services, see the *Junos OS Services Interfaces Library for Routing Devices*.

Related Documentation

- [Configuring the Junos OS to Enable Service Packages on Adaptive Services Interfaces on page 349](#)

Configuring the Junos OS to Enable Session Offloading on MX Series 3D Universal Edge Routers 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 658](#)

Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers

You can configure MX Series 3D Universal Edge Routers 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 195](#)
- [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 199](#)
- [16-Port 10-Gigabit Ethernet MPC on MX Series Routers \(16x10GE 3D MPC\) Overview on page 271](#)
- [network-services on page 616](#)

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. Also, this feature is supported on 10-Gigabit Ethernet interfaces on MX Series routers with MPC4E. However, this feature is not supported on MX Series routers with MPC3E. 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 29 on page 293](#) 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 29: 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)

Table 29: Adjustment Bytes for Logical Interfaces over Ethernet Interfaces (*continued*)

Encapsulation Type on Logical Interfaces	Number of Adjustment Bytes	Description
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.

Related Documentation

- [Configuring Layer 2 Overhead Accounting in Interface Statistics on page 295](#)
- [Verifying the Accounting of Layer 2 Overhead in Interface Statistics on page 296](#)
- [account-layer2-overhead on page 523](#)
- *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 295](#)

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
```

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, Runt: 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 293](#)
 - [Configuring Layer 2 Overhead Accounting in Interface Statistics on page 295](#)
 - *show interfaces (Gigabit Ethernet)*
 - *show interfaces statistics*
 - *Ethernet Interfaces Feature Guide for Routing Devices*

Configuring Dynamic Power Management to Optimize Power Utilization for MPCs

You can enable dynamic power management by configuring the [mic-aware-power-management](#) command at the **[edit chassis]** hierarchy level.

Before you enable dynamic power management, make sure that:

- The version of Junos OS that is installed on the router supports dynamic power management. Dynamic power management is supported only on MX240, MX480, MX960, MX2010, and MX2020 routers that run Junos OS Release 15.1.

- The MPCs support dynamic power management. Dynamic power management is supported only on MPC3E-3D-NG, MPC3E-3D-NG-Q, MPC2E-3D-NG, and MPC2E-3D-NG-Q.

To enable dynamic power management:

1. Run the **set chassis mic-aware-power-management** configuration mode command.

```
[edit]
user@router# set chassis mic-aware-power-management
```

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

```
[edit]
user@router# commit
warning: WARNING: MPC reboot or chassis reboot is required to use MIC aware
dynamic power management feature on already plugged-in MPCs.
commit complete
```

3. Restart the MPC by using the **request chassis fpc slot slot-number restart** command.

For example, to restart the MPC in slot 2:

```
[edit]
user@router# run request chassis fpc slot 2 restart
Restart initiated, use "show chassis fpc" to verify
```

4. (Optional) Verify that dynamic power management is enabled by using the **show chassis fpc slot-number detail** command.

For example, the following sample output provides additional information about power consumed by the MPCs and the MICs:

```
user@router# run 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 MIC0 Power Consumption          50 Watts
Max MIC1 Power Consumption          50 Watts
Max MPC Total Power Consumption     585 Watts
```

If the MPC does not support dynamic power management, the **show chassis fpc slot-number detail** command displays only the maximum power consumed by MPCs as shown in the following sample output:

```
user@router# run show chassis fpc 1 detail
Slot 1 information:
State                               Online
Temperature                         36
Total CPU DRAM                      2048 MB
Total RLDRAM                        1036 MB
Total DDR DRAM                      6656 MB
Start time:                         2014-07-18 03:40:37 PDT
```

```
Uptime:                               3 minutes, 41 seconds
Max Power Consumption                  520 Watts
```

5. (Optional) Verify the actual power consumption after the MPCs and MICs are brought online, by using the **show chassis power detail** operational mode command.

For example, the following sample output provides detailed information about the actual power consumption.

```
user@host> show chassis power detail
PEM 0:
  State:      Online
  DC input:   OK (1 feed expected, 1 feed connected)
  DC input:   48.0 V input (52000 mV)
  Capacity:   1440 W (maximum 1440 W)
  DC output:  520 W (zone 0, 10 A at 52 V, 36% of capacity)

PEM 1:
  State:      Empty
  Input:      Absent

PEM 2:
  State:      Online
  DC input:   OK (1 feed expected, 1 feed connected)
  DC input:   48.0 V input (52000 mV)
  Capacity:   1440 W (maximum 1440 W)
  DC output:  204 W (zone 0, 4 A at 51 V, 14% of capacity)

PEM 3:
  State:      Empty
  Input:      Absent

System:
  Zone 0:
    Capacity:      1440 W (maximum 1440 W)
    Allocated power: 1368 W (72 W remaining)
    Actual usage:   724 W
    Total system capacity: 1440 W (maximum 1440 W)
    Total remaining power: 72 W
```

- Related Documentation**
- [Disabling Dynamic Power Management on page 300](#)
 - [preserve-fpc-poweron-sequence on page 639](#)
 - [Understanding Dynamic Power Management on page 34](#)

Disabling Dynamic Power Management

You can disable dynamic power management by using the **delete chassis mic-aware-power-management** configuration mode command.

To disable dynamic power management:

1. Run the **delete chassis mic-aware-power-management** configuration mode command.

```
[edit]
user@router# delete chassis mic-aware-power-management
```
2. Review your configuration and issue the **commit** command.


```
[edit]
user@router# commit
warning: WARNING: MPC reboot or chassis reboot is required to disable MIC
aware dynamic power management feature on already plugged-in MPCs.
commit complete
```

- Restart the MPC by using the **request chassis fpc slot *slot-number* restart** command.

For example, to restart the MPC in slot 2:

```
[edit]
user@router# run request chassis fpc slot 2 restart
Restart initiated, use "show chassis fpc" to verify
```

- (Optional) Verify that dynamic power management is disabled, by using the **show chassis fpc *slot-number* detail** command.

For example, the following sample output shows the power consumption information displayed after dynamic power management is disabled.

```
[edit]
user@router# run show chassis fpc 2 detail
Slot 2 information:
    State                               Online
    Temperature                         35
    Total CPU DRAM                      2048 MB
    Total RLD RAM                      1036 MB
    Total DDR DRAM                     6656 MB
    Start time:                        2014-07-18 02:41:59 PDT
    Uptime:                             11 minutes, 27 seconds
    Max Power Consumption               585 Watts
```

Related Documentation

- [Configuring Dynamic Power Management to Optimize Power Utilization for MPCs on page 298](#)
- [preserve-fpc-poweron-sequence on page 639](#)
- [Understanding Dynamic Power Management on page 34](#)

Upgrading non-HQoS MPCs to Support Flexible Queuing

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:

- 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

- [Disabling Flexible Queuing for non-HQoS MPCs to Optimize Power Utilization on page 302](#)
- [Flexible Queuing Mode Overview on page 36](#)
- [flexible-queuing-mode on page 567](#)

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

- [Upgrading non-HQoS MPCs to Support Flexible Queuing on page 301](#)
- [Flexible Queuing Mode Overview on page 36](#)
- [flexible-queuing-mode on page 567](#)

CHAPTER 9

Configuring T Series Chassis-Level Features

- [Configuring the Power-On Sequence for FPCs on T640, T1600, and T4000 Routers on page 303](#)
- [Configuring OSS Mapping to Represent a T4000 Chassis as a T1600 or a T640 Chassis on page 304](#)
- [Configuring Voltage Level Monitoring of FPCs on page 305](#)

Configuring the Power-On Sequence for FPCs on T640, T1600, and T4000 Routers

Starting with Junos OS Release 12.3, you can configure the power-on sequence for the Flexible PIC Concentrators (FPCs) on T640, T1600, and T4000 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# show
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.
-

Related Documentation

- [Configuring the Six-Input DC Power Supply on page 427](#)
- [fru-poweron-sequence on page 580](#)

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 304](#)
- [Configuring T4000 Chassis as a T640 Chassis on page 304](#)
- [Disabling the OSS Mapping Feature on page 305](#)

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.

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 offline.

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 305](#)
- [Disabling Voltage Failure Errors on the FPC on page 306](#)

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 1322](#)
 - [fpc-nmi-volt-fail-knob on page 577](#)

CHAPTER 10

Configuring PTX Series Chassis-Level Features

- [Configuring the Power-On Sequence for MPCs and FPCs on MX Series, T Series and PTX Series Packet Transport Routers on page 307](#)
- [Configuring Port Speed on page 307](#)
- [Configuring FPC Error Levels and Actions on page 308](#)
- [Monitoring the Power Consumption of PTX5000 FPCs by Configuring the Ambient Temperature on page 309](#)

Configuring the Power-On Sequence for MPCs and FPCs on MX Series, T Series and PTX Series Packet Transport Routers

By default, Junos OS uses the ascending order of the slot numbers of the FPCs (MPCs in case of MX Series routers) as the sequence to power on the FPCs. To configure the power-on sequence, include the **fru-poweron-sequence** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
fru-poweron-sequence;
```

Issue the **show chassis power** command to view power limits and usage details for the FPCs. Issue the **show chassis power sequence** command to view details about the power-on sequence for the FPCs. .

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.

Related Documentation

- [fru-poweron-sequence on page 580](#)

Configuring Port Speed

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;
```

Related Documentation

- [port-speed on page 637](#)

Configuring FPC Error Levels and Actions

Starting with Junos OS Release 13.3 (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. Using 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
```

Related Documentation

- [Traffic Black Hole Caused by Fabric Degradation on page 401](#)
- [error on page 559](#)
- [fpc error on page 574](#)

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.



NOTE: FPC power consumption is measured at intervals of 65 seconds.



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 33](#)
- [chassis ambient-temperature on page 540](#)

CHAPTER 11

Configuring PIC-Specific Features

- [Configuring the Junos OS to Make a Flexible PIC Concentrator Stay Offline on page 313](#)
- [Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 315](#)
- [Configuring Junos OS to Enable SONET/SDH Framing for ATM MICs on page 318](#)
- [Configuring the Junos OS to Use ATM Cell-Relay Accumulation Mode on an ATM1 PIC on page 319](#)
- [Configuring the Junos OS to Support the Sparse DLCI Mode on Channelized STM1 or Channelized DS3 PICs on page 320](#)
- [Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized \(Multiplexed\) Mode on page 321](#)
- [Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 322](#)
- [Ranges for Channelized E1 Interfaces Configuration on page 323](#)
- [Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC on page 324](#)
- [Configuring the Junos OS to Support the Link Services PIC on page 324](#)
- [Multiclass Extension for Multiple Classes of Service Using MLPPP \(RFC 2686\) on page 325](#)
- [Configuring the Junos OS to Enable Larger Delay Buffers for T1, E1, and DS0 Interfaces Configured on Channelized IQ PICs on page 326](#)
- [Maximum Delay Buffer with q-pic-large-buffer Statement Enabled on page 326](#)
- [Configuring a Policer Overhead on page 328](#)
- [Configuring Mixed-Rate Mode Operation on page 329](#)
- [Configuring a Port Speed on page 330](#)

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 262](#)
- [Router Chassis Configuration Statements on page 516](#)

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 30: 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 30: 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 205](#)
- [TX Matrix Plus Router Configuration Overview on page 210](#)
- [Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized \(Multiplexed\) Mode on page 321](#)

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 a Port Speed on page 330](#)

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 395](#)
- [Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC on page 324](#)
- [Configuring the Junos OS to Enable Idle Cell Format and Payload Patterns for ATM Devices on page 396](#)
- [atm-cell-relay-accumulation on page 530](#)

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 321](#)
 - [Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 343](#)
 - [Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 322](#)
 - [Configuring the Junos OS to Support Channelized STM1 Interface Virtual Tributary Mapping on page 345](#)
 - [Configuring the Junos OS to Enable Larger Delay Buffers for T1, E1, and DS0 Interfaces Configured on Channelized IQ PICs on page 326](#)

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 315](#)
- [Configuring the Junos OS to Support the Sparse DLCI Mode on Channelized STM1 or Channelized DS3 PICs on page 320](#)

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 31 on page 323](#) 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 DSO 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 x 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 323](#)

Ranges for Channelized E1 Interfaces Configuration

Table 31 on page 323 shows the ranges for configuring channel groups and time slots for Channelized E1 Interfaces.

Table 31: 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

Table 31: Ranges for Channelized E1 Configuration (*continued*)

Item	Variable	Range
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 322](#)

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 395](#)

Configuring the Junos OS to Support the Link Services PIC

The Multilink Protocol enables you to split, recombine, and sequence datagrams across multiple logical data links. The goal of multilink operation is to coordinate multiple

independent links between a fixed pair of systems, providing a virtual link with greater bandwidth than any of the members.

The Link Services PIC supports the following Multilink Protocol encapsulation types at the logical unit level:

- Multilink Point-to-Point Protocol (MLPPP)
- Multilink Frame Relay (MLFR FRF.15)

The Link Services PIC also supports the Multilink Frame Relay UNI and NNI (MLFR FRF.16) encapsulation type at the physical interface level.

MLFR (FRF.16) is supported on a channelized interface, **ls-fpc/pic/port:channel**, which denotes a single MLFR (FRF.16) bundle. For MLFR (FRF.16), multiple links are combined to form one logical link. Packet fragmentation and reassembly occur on a per-virtual circuit (VC) basis. Each bundle can support multiple VCs. The physical connections must be E1, T1, channelized DS3 to DS1, channelized DS3 to DS0, channelized E1, channelized STM 1, or channelized IQ interfaces.

The default number of bundles per Link Services PIC is 16, ranging from **ls-fpc/pic/port:0** to **ls-fpc/pic/port:15**.

To configure the number of bundles on a Link Services PIC, include the **mlfr-uni-nni-bundles** statement at the **[edit chassis fpc slot-number pic pic-number]** hierarchy level:

```
[edit chassis fpc slot-number pic pic-number]
  mlfr-uni-nni-bundles number;
```

The maximum number of MLFR UNI NNI bundles each Link Services PIC can accommodate is 128. A link can associate with one link services bundle only.



NOTE: The Link Services PIC is not compatible with the M160 or T Series routers.

**Related
Documentation**

- [Multiclass Extension for Multiple Classes of Service Using MLPPP \(RFC 2686\) on page 325](#)

Multiclass Extension for Multiple Classes of Service Using MLPPP (RFC 2686)

The multiclass extension to the MLPPP extension enables multiple classes of service using MLPPP. For more information, see RFC 2686, *The Multi-Class Extension to Multi-Link PPP*. The Junos OS PPP implementation does not support the negotiation of address field compression and protocol field compression PPP NCP options. The software always sends a full 4-byte PPP header.

**Related
Documentation**

- [Configuring the Junos OS to Support the Link Services PIC on page 324](#)

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 32 on page 326](#).)

Related Documentation

- [Maximum Delay Buffer with q-pic-large-buffer Statement Enabled on page 326](#)

Maximum Delay Buffer with q-pic-large-buffer Statement Enabled

[Table 32 on page 326](#) lists the maximum delay buffer that can be configured for T1, E1, and DS0 interfaces configured on Channelized IQ PICs:

Table 32: Maximum Delay Buffer with q-pic-large-buffer Statement Enabled

Platform, PIC, or Interface Type	Maximum Buffer Size
With Large Buffer Sizes Not Enabled	
T Series and M320 routers	50,000 microseconds

Table 32: Maximum Delay Buffer with q-pic-large-buffer Statement Enabled (*continued*)

Platform, PIC, or Interface Type	Maximum Buffer Size
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
With Large Buffer Sizes Enabled	
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
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

Table 32: Maximum Delay Buffer with q-pic-large-buffer Statement Enabled (*continued*)

Platform, PIC, or Interface Type	Maximum Buffer Size
Other IQ interfaces	500,000 microseconds

Related Documentation

- [Configuring the Junos OS to Enable Larger Delay Buffers for T1, E1, and DS0 Interfaces Configured on Channelized IQ PICs on page 326](#)

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 556](#)
 - [ingress-policer-overhead on page 589](#)

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-SFP and PF-12XGE-SFP 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 612](#)

Configuring a Port Speed

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 666](#)
- [no-multi-rate on page 618](#)

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 333](#)

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 578](#)

Configuring Chassis Settings to Support Aggregated Devices

- [Configuring Junos OS for Supporting Aggregated Devices on page 335](#)

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 335](#)
- [Configuring LACP Link Protection at the Chassis Level on page 336](#)
- [Enabling LACP Link Protection on page 336](#)
- [Configuring System Priority on page 337](#)
- [Configuring the Maximum Links Limit on page 337](#)
- [Configuring PPM on Junos Fusion on page 337](#)

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;
  }
}
```

For M Series and T Series routers you can configure a maximum of 128 aggregated interfaces (LAG bundles). On MX Series routers running Junos release 14.2R2 and earlier, you can configure a maximum of 480 aggregated interfaces. For MX Series routers running

Junos release 14.2R3 and later you can configure a maximum of 1000 aggregated interfaces. For MX2010 and MX2020 routers you can configure a maximum of 800 aggregated interfaces. In all cases the aggregated interfaces are numbered from **ae0** through **ae4091**.

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).

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.



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;
```

These values are configured by default if you use Junos Fusion with Junos OS Release 14.2R4 or later.

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 339](#)

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 603](#)

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 343](#)
- [Ranges for Channelized DS3-to-DS0 Configuration on page 344](#)
- [Configuring the Junos OS to Support Channelized STM1 Interface Virtual Tributary Mapping on page 345](#)
- [Configuring the Junos OS to Enable Channelization on DS3/E3 MIC on page 345](#)

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 33 on page 344](#) 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 344](#)

Ranges for Channelized DS3-to-DS0 Configuration

Table 33 on page 344 shows the ranges for each of the quantities in the preceding configuration.

Table 33: Ranges for Channelized DS3-to-DS0 Configuration

Item	Variable	Range
FPC slot	<i>slot-number</i>	0 through 7 (see note below)

Table 33: Ranges for Channelized DS3-to-DS0 Configuration (*continued*)

Item	Variable	Range
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 343](#)

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 320](#)
 - [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 537](#)

Configuring Chassis Settings to Support Adaptive Services Interfaces

- [Configuring the Junos OS to Enable Service Packages on Adaptive Services Interfaces on page 349](#)

Configuring the Junos OS to Enable Service Packages on Adaptive Services Interfaces

For Adaptive Services (AS) PICs, MultiServices PICs, and the internal Adaptive Services Module (ASM) in the M7i platform, there are two service packages: Layer 2 and Layer 3. Both service packages are supported on all adaptive services interfaces, but you can enable only one service package per PIC, with the exception of the combined package supported on the ASM. On a single router, you can enable both service packages by installing two or more PICs on the platform.

You enable service packages per PIC, not per port. For example, if you configure the Layer 2 service package, the entire PIC uses the configured package. To enable a service package, include the **service-package** statement at the **[edit chassis fpc slot-number pic pic-number adaptive-services]** hierarchy level, and specify **layer-2** or **layer-3**:

```
[edit chassis fpc slot-number pic pic-number adaptive-services]
service-package (layer-2 | layer-3);
```

To determine which package an AS PIC supports, issue the **show chassis hardware** command: if the PIC supports the Layer 2 package, it is listed as **Link Services II**, and if it supports the Layer 3 package, it is listed as **Adaptive Services II**. To determine which package a MultiServices PIC supports, issue the **show chassis pic fpc-slot slot-number pic-slot slot-number** command. The **Package** field displays the value **layer-2** or **layer-3**.



NOTE: The ASM has a default option that combines the features available in the Layer 2 and Layer 3 service packages.

After you commit a change in the service package, the PIC is taken offline and then brought back online immediately. You do not need to manually take the PIC offline and online.



.....

NOTE: Changing the service package causes all state information associated with the previous service package to be lost. You should change the service package only when there is no active traffic going to the PIC.

.....

The services supported in each package differ by PIC and platform type.

**Related
Documentation**

- [Configuring the Junos OS to Support Layer 2 Services on MX Series 3D Universal Edge Routers with MS-DPCs on page 291](#)

CHAPTER 17

Configuring Chassis Settings to Support External Clock Synchronization

- [Configuring the Junos OS to Support an External Clock Synchronization Interface for M Series and T Series Routers on page 351](#)
- [Configuring Clock Synchronization Interface on MX Series Routers on page 353](#)
- [Clock Sources for PTX Series Packet Transport Routers on page 363](#)
- [Synchronizing Internal Stratum 3 Clock to External Clock Sources on PTX Series Routers on page 365](#)
- [Example: Configuring Synchronous Ethernet on MX Series Routers on page 368](#)
- [Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 372](#)

Configuring the Junos OS to Support an External Clock Synchronization Interface for M Series and T Series Routers

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 365](#)

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 167](#).

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 354](#)
- [Display the External Clock Synchronization Configuration for SCB on page 358](#)
- [Display the External Clock Synchronization Configuration for SCBE on page 359](#)
- [Display the External Clock Synchronization Configuration for SCBE2 on page 360](#)
- [Displaying the External Clock Synchronization Configuration for MX2020 Control Board on page 361](#)

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 and MX2020 Control Board have two external interfaces—external-0/0 and external-1/0. Configure the following options for SCBE2 and MX2020 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)
```

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 and MX2020 Control Board:

- 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
```

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 and MX2020 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
```

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-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);
    }
}

```

Related Documentation

- [Centralized Clocking Overview on MX Series Routers on page 140](#)
- [Example: Configuring Synchronous Ethernet on MX Series Routers on page 368](#)
- [request chassis synchronization mode on page 766](#)
- [show chassis synchronization \(MX Series Routers\) on page 1678](#)
- [synchronization on page 672](#)
- [Understanding Clock Synchronization on page 167](#)

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.

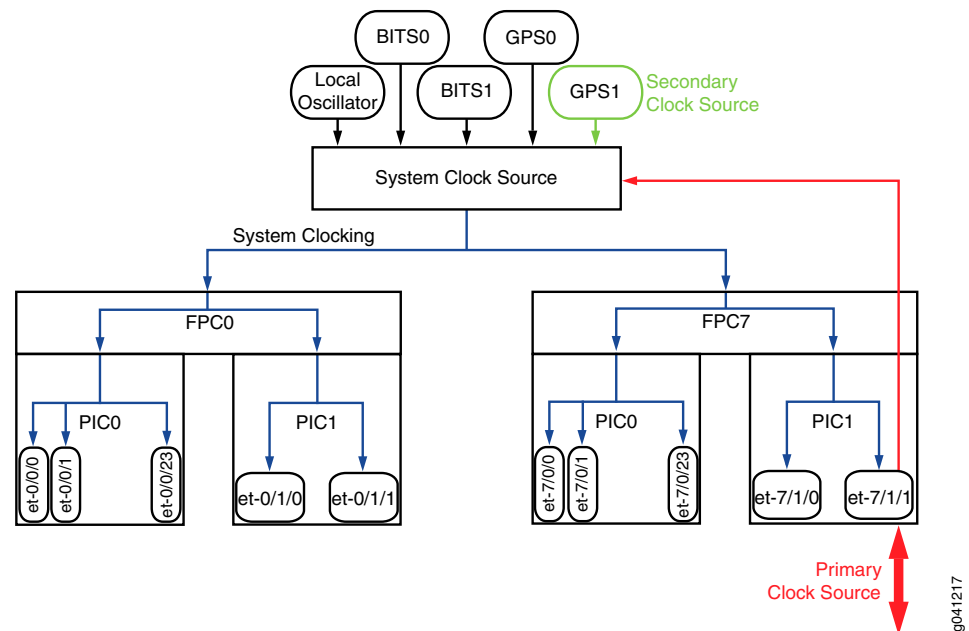
PTX Series Packet Transport Routers can use an internal clock source or it can extract clocking from an external source.

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 5: 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 Packet Transport Router to an External Clocking Device*.

Related Documentation

- [Synchronizing Internal Stratum 3 Clock to External Clock Sources on PTX Series Routers on page 365](#)
- [recovered-clock on page 648](#)
- [synchronization \(PTX Series\) on page 680](#)

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 365](#)
- [Configuring External Clock Synchronization Options on page 365](#)

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: 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 167](#).

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.

Related Documentation

- [Clock Sources for PTX Series Packet Transport Routers on page 363](#)
- [Understanding Clock Synchronization on page 167](#)
- [recovered-clock on page 648](#)
- [synchronization on page 680](#)

Example: Configuring Synchronous Ethernet on MX Series Routers

- [Requirements on page 368](#)
- [Overview on page 368](#)
- [Configuration on page 368](#)
- [Verification on page 370](#)

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 3D Universal Edge Routers 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 353](#).

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 370](#)
- [Verifying All the Parameters for Synchronization on page 370](#)
- [Verifying the Global Configuration on page 370](#)
- [Verifying the ESMC Transmit Parameters on page 371](#)
- [Verifying the ESMC Statistics Parameters on page 371](#)
- [Verifying That the ESMC Statistics Are Cleared on page 371](#)

Verifying the Basic Parameters for Synchronization

Purpose	Verify that the basic synchronization parameters such as the current clock status, clock locked to, and configured sources are working as expected.
Action	From operational mode, enter the run show chassis synchronization command to display the synchronization details.
Meaning	The output displays the basic synchronization parameters configured on the interface.

Verifying All the Parameters for Synchronization

Purpose	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 363](#)
 - [Configuring Clock Synchronization Interface on MX Series Routers on page 353](#)
 - [Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 372](#)
 - [request chassis synchronization mode on page 766](#)
 - [show chassis synchronization \(MX Series Routers\) on page 1678](#)
 - [synchronization \(MX Series\) on page 672](#)
 - [Synchronous Ethernet Overview on page 149](#)

Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC

- [Requirements on page 372](#)
- [Overview on page 372](#)
- [Configuration on page 373](#)

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 157](#).

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 353](#).

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 363](#)
- [Configuring Clock Synchronization Interface on MX Series Routers on page 353](#)
- [request chassis synchronization mode on page 766](#)
- [show chassis synchronization \(MX Series Routers\) on page 1678](#)
- [Synchronous Ethernet Overview on page 149](#)
- [Synchronous Ethernet on 10-Gigabit Ethernet MIC Overview on page 157](#)
- [synchronization \(MX Series\) on page 672](#)

CHAPTER 18

Configuring Chassis Setting to Support Precision Time Protocol

- [Configuring Precision Time Protocol on page 375](#)
- [Example: Configuring Precision Time Protocol on page 379](#)

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 375](#)

Configuring Precision Time Protocol and its Options

This topic includes the following tasks:

1. [Configuring PTP Options on page 375](#)
2. [Configuring Slave Clock Options on page 376](#)
3. [Configuring Master Clock Options on page 378](#)

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 master.

```
[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. Configure multicast mode option for the slave. 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
```

11. 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.

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. Configure multicast mode option for the master. 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
```

11. 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.

Related Documentation

- [\[edit protocols ptp\] Hierarchy Level on page 522](#)
- [Precision Time Protocol Overview on page 163](#)
- [Example: Configuring Precision Time Protocol on page 379](#)

Example: Configuring Precision Time Protocol

- [Requirements for PTP Configuration on page 380](#)
- [Overview on page 380](#)

- [Configuration on page 380](#)
- [Verification on page 382](#)

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 3D Universal Edge Routers 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 375](#).

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 382](#)
- [Verifying the Lock Status of the Slave on page 382](#)
- [Verifying the PTP Options on the Slave on page 383](#)
- [Verifying the PTP Options and the Current Status of the Master on page 383](#)
- [Verifying the Number and Status of the PTP Ports on page 383](#)

Verifying the PTP Clock Details

Purpose	Verify that the PTP clock is working as expected.
Action	In operational mode, enter the run show ptp clock command to display the clock details.
Meaning	The output displays the clock details, which include the parameters configured on the node. For more information about the run show ptp clock operational command, see show ptp clock .

Verifying the Lock Status of the Slave

Purpose	Verify that the slave clock is aligned to the master clock by checking the lock status of the slave.
Action	In operational mode, enter the run show ptp lock-status command to display the lock status of the slave.
Meaning	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 run show ptp lock-status operational command, see show ptp lock-status .

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**
- [\[edit protocols ptp\] Hierarchy Level on page 522](#)
 - [Configuring Precision Time Protocol on page 375](#)
 - [Precision Time Protocol Overview on page 163](#)

Configuring Chassis Setting to Support Hybrid Mode

- [Configuring Hybrid Mode and ESMC Quality Level Mapping on page 385](#)
- [Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 388](#)

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 3D Universal Edge Routers and on MX80 3D Universal Edge Routers 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 183](#). The following procedures explain configuring hybrid mode with either of the modes in detail.

- [Configuring the Router in Hybrid Mode on page 386](#)
- [Configuring Hybrid Mode with Mapping of the PTP Clock Class to the ESMC Quality Level on page 386](#)
- [Configuring Hybrid Mode with a User-Defined Mapping of the PTP Clock Class to the ESMC Quality Level on page 387](#)

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 388.

**Related
Documentation**

- [Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 388](#)
- [Understanding Hybrid Mode on page 191](#)
- [Precision Time Protocol Overview on page 163](#)
- [Synchronous Ethernet Overview on page 149](#)

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 3D Universal Edge Routers.

- [Requirements for Hybrid Mode Configuration on page 388](#)
- [Overview on page 388](#)
- [Configuration on page 390](#)
- [Verification on page 392](#)

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 3D Universal Edge Routers and on MX80 3D Universal Edge Routers 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 183](#). 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 385](#).

Configuration

- [Hybrid Mode with Mapping of the PTP Clock Class to the ESMC Quality Level on page 390](#)
- [Hybrid Mode with a User-Defined Mapping of the PTP Clock Class to the ESMC Quality Level on page 391](#)

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	<p>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.</p> <pre>[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</pre>
Step-by-Step Procedure	<p>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:</p> <ol style="list-style-type: none"> 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. <pre>[edit protocols ptp slave] user@host# set clock-class-to-quality-level-mapping quality-level prc clock-class 80</pre> 2. Configure hybrid mode on the slave. <pre>[edit protocols ptp slave] user@host# edit hybrid</pre> 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. <pre>[edit protocols ptp slave hybrid] user@host# set synchronous-ethernet-mapping clock-source 2.2.2.2 interface ge-1/2/3.0</pre>
Results	<p>Display the results of the configuration of hybrid mode with a user-defined mapping of the PTP clock class to the ESMC quality level:</p> <pre>[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; } } }</pre>

```
    }  
  }  
}
```

Verification

- [Verifying That the Router Is Operating in Hybrid Mode on page 392](#)
- [Verifying the Quality Level Change on the Transmit Side on page 392](#)
- [Verifying Global Information Parameters After Mapping of the PTP Clock Class to the ESMC Quality Level in Hybrid Mode on page 392](#)
- [Verifying Global Information Parameters After Configuring User-Defined Mapping of the PTP Clock Class to the ESMC Quality Level in Hybrid Mode on page 393](#)

Verifying That the Router Is Operating in Hybrid Mode

Purpose	Verify the current mode of operation of the slave.
Action	<p>In operational mode, enter the run show ptp hybrid command to display the current configuration and current mode of operation of the slave.</p> <p>In operational mode, enter the run show ptp hybrid config command to display the PTP source to Synchronous Ethernet interface mappings.</p> <p>In operational mode, enter the run show ptp hybrid status command to display the current hybrid mode operational status.</p>
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 385](#)
- [Understanding Hybrid Mode on page 191](#)
- [Precision Time Protocol Overview on page 163](#)
- [Synchronous Ethernet Overview on page 149](#)

Configuring Chassis Settings to Support ATM Devices

- [Configuring the Junos OS to Enable ATM2 Intelligent Queuing Layer 2 Circuit Transport Mode on page 395](#)
- [Configuring the Junos OS to Enable Idle Cell Format and Payload Patterns for ATM Devices on page 396](#)

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 324](#)
- [Configuring the Junos OS to Enable Idle Cell Format and Payload Patterns for ATM Devices on page 396](#)
- [Configuring the Junos OS to Use ATM Cell-Relay Accumulation Mode on an ATM1 PIC on page 319](#)

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 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 205. For information about the TX Matrix Plus router, see “[TX Matrix Plus Router Configuration Overview](#)” on page 210.

Related Documentation

- [Configuring the Junos OS to Use ATM Cell-Relay Accumulation Mode on an ATM1 PIC on page 319](#)
- [Configuring the Junos OS to Enable ATM2 Intelligent Queuing Layer 2 Circuit Transport Mode on page 395](#)
- [Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC on page 324](#)
- [Configuring Layer 2 Circuit Transport Mode on ATM MICs](#)
- [Example: Configuring Layer 2 Circuit Transport Mode on ATM MICs](#)

CHAPTER 21

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 399](#)
- [Signaling Neighboring Routers of Fabric Down on T640 and T1600 Routers on page 400](#)
- [Traffic Black Hole Caused by Fabric Degradation on page 401](#)
- [Detection and Recovery of Fabric-Related Failures Caused by Traffic Black Holes on MX Series Routers on page 404](#)
- [Corrective Actions for Fabric Failures on MX Series Routers on page 406](#)
- [Detection and Corrective Actions of FPCs with Degraded Fabric on MX Series Routers on page 409](#)
- [Managing Bandwidth Degradation to Prevent Traffic Black Holes on page 411](#)
- [Disabling FPC Restart on page 412](#)
- [Disabling an FPC with Degraded Fabric Bandwidth on page 412](#)
- [Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 413](#)
- [Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels on page 414](#)
- [Configuring the Junos OS to Enable a Routing Engine to Reboot on Hard Disk Errors on page 416](#)
- [Associating Sampling Instances for Active Flow Monitoring with a Specific FPC, MPC, or DPC on page 417](#)
- [Configuring a Policer Overhead on page 417](#)
- [Configuring Sanity Polling on page 418](#)
- [Configuring Slow Packet Forwarding Engine Alarm on page 421](#)

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*

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*

Traffic Black Hole Caused by Fabric Degradation

A traffic black hole occurs when packets are 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 for a traffic black hole.

Systems can limit the black-hole time by detecting unreachable destination Packet Forwarding Engines and notifying connected systems when they cannot carry traffic because of a severely degraded fabric.

When the system detects unreachable Packet Forwarding Engine destinations, healing from a traffic black hole is attempted. If the healing fails, the system turns off the interfaces, thereby preventing a traffic black hole.

By default, the system limits black-hole time by detecting severely degraded fabric. No user interaction is necessary.

- [Packet Forwarding Engine Errors and Recovery on PTX Series Routers on page 402](#)
- [Packet Forwarding Engine Errors and Recovery on T640, T1600 or TX Matrix Routers on page 402](#)

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.
- Voltage or polled I/O errors in the SIBs are detected by the control board.
- Link 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 Flexible PIC Concentrator (FPC) is corrupt.
2. SIB and FPC restart phase: The router restarts both the SIBs and the FPCs. If there are corrupt FPCs that are unable to initiate high-speed links to the fabric after reboot, a traffic black hole cannot be created because no interfaces are created for these FPCs.
3. FPC offline phase: Because previous attempts at recovery failed, FPCs and interfaces are turned off and a traffic black hole is prevented.

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.
- 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. Fabric plane restart phase: The router restarts the fabric planes one by one. This phase does not start if the fabric plane is functioning properly and a single Flexible PIC Concentrator (FPC) is corrupt.
2. Fabric plane and FPC restart phase: The router restarts both the fabric planes and the FPCs. If there are corrupt FPCs that are unable to initiate high-speed links to the fabric after reboot, a traffic black hole cannot be created because no interfaces are created for these FPCs.
3. FPC offline phase: Because previous attempts at recovery failed, FPCs and interfaces are turned off and a traffic black hole is prevented.



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.

The phased recovery mechanism mentioned above cannot address certain issues such as the following:

- Continuous SPMB reboot
- Wedge conditions such as SMq stuck, Nf stuck, XM stuck, and notification buffer stuck. These wedge conditions are a result of errors in the ASICs SMq, Nf, and XM.
- Unresponsive fabric manager due to fabric black hole

Starting in Junos OS Release 14.2 R6, 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 FPC.

Related Documentation

- [Disabling FPC Restart on page 412](#)
- [Router Chassis Configuration Statements on page 516](#)
- [degraded on page 550](#)
- [error on page 559](#)
- [fpc error on page 574](#)

Detection and Recovery of Fabric-Related Failures Caused by Traffic Black Holes on MX Series Routers

A traffic black hole occurs when a 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 traffic black holes.

The following fabric failure scenarios can occur:

- Removal of the control board
- High-speed link 2 (HSL2) training failures
- Single link failure on an Flexible PIC Concentrator (FPC)
- Multiple link failures on the same FPC or the same fabric plane
- Multiple link failures randomly on an FPC or a fabric plane
- Intermittent cyclic redundancy check (CRC) errors
- A total traffic black hole for only one destination and not to other destinations

When an FPC does not forward traffic due to a certain reason to other FPCs 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 FPCs and, instead, the packets are continued to be sent to the affected FPC and are dropped at that point. The following might be the causes for an FPC 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 DPC might have disabled the fabric streams due to destination errors.

If all the Switch Control Boards (SCBs) lose connectivity to the DPCs, then all the interfaces are brought down. If a Packet Forwarding Engine of a DPC loses complete connectivity to or from the fabric, then that DPC 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 FPCs 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. Recovery from traffic black hole 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 a black hole occurs because of a single bad FPC, which is either a common source or common destination of the destination timeout, if you the 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 FPC. An alarm is triggered to indicate that the particular FPC is causing a traffic black hole.

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 DPC takes the local action of disabling removed planes. If spare planes are available, DPC 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 traffic black hole 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 FPCs is considered as an indication for plane failures. Even if one Packet Forwarding Engine on an FPC flashes an error, the FPC 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 Dense Port Concentrators (DPCs) and takes

a corrective action. For example, a ping failure for all links of the same DPC might indicate a problem on the DPC. Ping failure for multiple DPCs for the same fabric plane might denote 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 DPCs 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 DPCs.

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 DPC 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 FPCs with Degraded Fabric on MX Series Routers on page 409](#)
- [Corrective Actions for Fabric Failures on MX Series Routers on page 406](#)
- [redundancy-mode on page 650](#)
- [show chassis fabric redundancy-mode on page 1230](#)
- [Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 413](#)

Corrective Actions for Fabric Failures on MX Series Routers

This topic contains the following sections that describe different fabric failure scenarios, the detection methods used, and the corrective actions for the faults:

- [Traffic Black Hole Healing on page 407](#)
- [FPCs with Degraded Fabric on page 408](#)
- [Complete Black Hole Towards a Single Destination Only on page 408](#)
- [Redundancy Fabric Mode on Active Control Boards on page 408](#)

Traffic Black Hole Healing

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 SIBs 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 caused by destination timeouts, even when the SIBs are online.

When the system detects any unreachable Packet Forwarding Engine destinations, healing from a traffic black hole is attempted. If the healing fails, the system turns off the interfaces, thereby stopping the traffic black hole.

The recovery process consists of the following phases:

1. Fabric plane restart phase: Healing is attempted by restarting the fabric planes one by one. This phase does not start if the fabric plane is functioning properly and a single Flexible PIC Concentrator (FPC) is bad. An error message is generated to specify that a black hole is the reason for the fabric plane being turned offline. This phase is performed for fabric plane errors only.
2. Fabric plane and FPC restart phase: The system waits for the first phase to be completed before examining the system state again. If the black hole condition still persists after the first phase is performed or if the problem occurs again within a duration of 10 minutes, healing is attempted by restarting both the fabric planes and the FPCs. If you have configured the **action-fpc-restart-disable** statement at the **[edit chassis fabric degraded]** hierarchy level to disable restart of the FPCs when a recovery is attempted, an alarm is triggered to indicate that a traffic black hole has occurred. In this second phase, three steps are taken:
 1. All the FPCs 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 FPCs that were turned offline are brought back online.
3. FPC offline phase: The system waits for the second phase to be completed before examining the system state again. Traffic black hole is limited by turning the FPCs offline and by turning off interfaces because previous attempts at recovery have failed. If the problem is not resolved by restarting the FPCs or if the problem recurs within 10 minutes after restarting the FPCs, this phase is performed.

The three phases are controlled by timers. During these phases, if an event (such as offlining/onlining FPCs 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 FPCs, the fabric planes are restarted. If another fabric error occurs within the next 10 minutes, the fabric planes and FPCs 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 bad FPC, for example, one source FPC or one destination FPC, only that FPC 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 FPC is turned offline.

By default, the system limits black-hole time by detecting severely degraded fabric. No user interaction is necessary.

FPCs with Degraded Fabric

You can configure an FPC 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 black hole scenarios where bringing the FPC offline results in faster re-routing. To configure this option on an FPC, 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 FPCs with Degraded Fabric on MX Series Routers” on page 409](#).

Complete Black Hole Towards a Single Destination Only

In certain deployments, an FPC indicates a complete black hole towards a single destination only, but it functions properly for other destinations. Such cases are identified and the affected FPC 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 FPC 0 and FPC1. If FPC 0 has single link failures for planes 0 and 1 and if FPC 1 has single link failures for planes 2 and 3, a complete black hole occurs between the two FPCs. Both FPC 0 and FPC 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 FPCs use 4 fabric planes as active planes, regardless of the type of the FPC. 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 413](#).

- Related Documentation**
- [Detection and Corrective Actions of FPCs with Degraded Fabric on MX Series Routers on page 409](#)
 - [Detection and Recovery of Fabric-Related Failures Caused by Traffic Black Holes on MX Series Routers on page 404](#)
 - [redundancy-mode on page 650](#)
 - [show chassis fabric redundancy-mode on page 1230](#)
 - [Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 413](#)

Detection and Corrective Actions of FPCs with Degraded Fabric on MX Series Routers

You can configure an FPC 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 FPC or restarting the system.

The following scenarios can occur when you configure the feature to disable FPCs with degraded fabric:

- If an FPC has degraded fabric bandwidth and if you configure this capability to turn off such an FPC after it has been operating with degraded fabric for some time, the corrective action is still taken.
- If an FPC has been brought offline because of fabric errors and this functionality to move the FPC to offline state is disabled, the FPC is transitioned to the online state automatically.
- If an FPC has been brought offline because of fabric errors and this functionality to move the FPC to offline state is disabled or configured for some other FPC, the FPC that was turned offline is transitioned to the online state automatically.
- All the FPCs 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 FPC that is disabled because of degraded fabric to be moved to the online state.

Degraded fabric indicates that an FPC is operating with less than the required number of active fabric planes. If an FPC is operating with less than four planes, it is considered to be degraded. This rule applies to all types of FPCs 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 FPC and it is online for other FPCs. 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 FPCs 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 FPC 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 FPCs that contain three control boards
 - MX240 or MX480 routers with I-chip or I-chip and Trio-chip-based FPCs that contain two control boards
 - MX960, MX480, or MX240 routers that contain only Trio-based FPCs are not considered to contain a spare control board

If during any such interval of 5 seconds, two FPCs 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 FPCs with degraded fabric, self-ping state for each FPC is monitored at intervals of 5 seconds at the Routing Engine. The following conditions can occur:
 - During any 5-second interval, if only one FPC indicates a failure for a plane, the fabric Manager waits for the next interval. During the subsequent interval, if no other FPC indicates a failure for the same plane, switchover of the control board is performed.
 - During any 5-second interval, if multiple FPCs 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 FPCs are turned offline even if the spare control board is present.
 - During any 5-second interval, if any FPC 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 FPC is turned offline even if the spare control board is present.

- If spare planes are not available, the FPC is turned offline when it displays a failure for a single plane or multiple planes. The FPC 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 Traffic Black Holes on MX Series Routers on page 404](#)
- [Corrective Actions for Fabric Failures on MX Series Routers on page 406](#)
- [redundancy-mode on page 650](#)
- [show chassis fabric redundancy-mode on page 1230](#)

Managing Bandwidth Degradation to Prevent Traffic Black Holes

A traffic black hole occurs when packets are 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 for a traffic black hole.

By default, Juniper Networks routers attempt to start healing from a traffic black hole when the system detects unreachable Packet Forwarding Engine destinations. If the healing fails, the system turns off the interfaces, thereby preventing the traffic black hole.

Starting with Junos OS Release 15.1, MX Series routers can be configured with the **bandwidth-degradation** statement to detect and respond to fabric plane degradation before it creates a traffic black hole. Users can also configure the **blackhole-action** statement to specify which healing actions the router should take once a traffic black hole is detected.

The **bandwidth-degradation** statement is configured with a percentage and an action. The **percentage** value can range from 1 to 99, and it represents the percentage of fabric degradation needed to trigger a response from the FPC. The **action** attribute determines the type of response the FPC performs once fabric degradation reaches the configured percentage.

The **blackhole-action** 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 FPC with a degraded fabric plane is restarted once the threshold is reached.

- **offline:** 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.
- **restart-then-offline:** 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.



NOTE: The **bandwidth-degradation** configuration statement is mutually exclusive with the **offline-on-fabric-bandwidth-reduction** statement. If both statements are configured, the commit check fails and returns an error.

- Related Documentation**
- [bandwidth-degradation on page 534](#)
 - [blackhole-action on page 534](#)

Disabling FPC Restart

You can disable FPC restart 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 FPCs, use the **action-fpc-restart-disable** statement at the **[edit chassis fabric degraded]** hierarchy level:

```
[edit chassis fabric]
degraded {
  action-fpc-restart-disable;
}
```

Whenever FPC restart is disabled, an alarm is raised when there are unreachable destinations present in the router, and you must restart the FPCs manually.

To ensure that both the fabric planes (T640 and T1600 routers) or the SIBs (PTX Series routers) and the FPCs 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**
- [Traffic Black Hole Caused by Fabric Degradation on page 401](#)
 - [Router Chassis Configuration Statements on page 516](#)

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 621](#)
- [Traffic Black Hole Caused by Fabric Degradation on page 401](#)
- [Router Chassis Configuration Statements on page 516](#)

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. If you do not configure this option, increased fabric bandwidth mode is enabled by default on MX routers.

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 650](#)
- [show chassis fabric redundancy-mode on page 1230](#)

- [Router Chassis Configuration Statements on page 516](#)

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 segment primarily 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
- 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 609](#)
- [filter on page 566](#)
- [route \(chassis\) on page 653](#)
- [vpn-label on page 694](#)
- *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 *Junos OS High Availability Library for Routing Devices*.

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**

- [Junos Services Interfaces Configuration Guide](#)
- [Example: Sampling Instance Configuration](#)
- [sampling-instance on page 655](#)

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 556](#)
 - [ingress-policer-overhead on page 589](#)

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]
cfeb 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 656](#)
 - [retry-count on page 653](#)
 - [on-error on page 623](#)

Configuring Slow Packet Forwarding Engine Alarm

On an M Series, an MX Series, or a T 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, or T 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 421](#)
- [Disabling Slow Packet Forwarding Engine Alarm on page 421](#)
- [Verifying That the Alarm Output and System Log Messages Are Updated on page 422](#)

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, or a T 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 661](#)

CHAPTER 22

Configuring Chassis Settings for the Craft Interface

- [Configuring the Junos OS to Disable the Physical Operation of the Craft Interface on page 425](#)

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 the Junos OS to Determine Conditions That Trigger Alarms on Different Interface Types on page 431](#)
- [Silencing External Devices Connected to Alarm Relay Contacts on page 472](#)

Configuring Chassis Settings for PEMs

- [Configuring the Six-Input DC Power Supply on page 427](#)

Configuring the Six-Input DC Power Supply

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 428](#)
- [Configuring the Six-Input DC Power Supply on T640 and T1600 Routers on page 428](#)
- [Configuring the Six-Input DC Power Supply on T4000 Routers on page 429](#)

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 28](#).

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 28](#)
- [Configuring the Power-On Sequence for FPCs on T640, T1600, and T4000 Routers on page 303](#)

- [pem on page 630](#)
- [feeds on page 564](#)
- [input-current on page 591](#)
- [fru-poweron-sequence on page 580](#)
- *Chassis Traps*

Configuring Chassis Settings for Alarms

- [Configuring the Junos OS to Determine Conditions That Trigger Alarms on Different Interface Types on page 431](#)
- [System-Wide Alarms and Alarms for Each Interface Type on page 432](#)
- [Chassis Conditions That Trigger Alarms on page 433](#)
- [Silencing External Devices Connected to Alarm Relay Contacts on page 472](#)

Configuring the 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 432](#)
- [Chassis Conditions That Trigger Alarms on page 433](#)
- [Silencing External Devices Connected to Alarm Relay Contacts on page 472](#)

System-Wide Alarms and Alarms for Each Interface Type

Table 34 on page 432 lists the system-wide alarms and the alarms for each interface type.

Table 34: Configurable PIC Alarm Conditions

Interface/System	Alarm Condition	Configuration Option
SONET/SDH and ATM	Link alarm indication signal	ais-l
	Path alarm indication signal	ais-p
	Signal degrade (SD)	ber-sd
	Signal fail (SF)	ber-sf
	Loss of cell delineation (ATM only)	locd
	Loss of framing	lof
	Loss of light	lol
	Loss of pointer	lop-p
	Loss of signal	los
	Phase-locked loop out of lock	pll
	Synchronous transport signal (STS) payload label (C2) mismatch	plm-p
	Line remote failure indication	rfi-l
	Path remote failure indication	rfi-p
	STS path (C2) unequipped	uneq-p

Table 34: Configurable PIC Alarm Conditions (*continued*)

Interface/System	Alarm Condition	Configuration Option
E3/T3	Alarm indicator signal	ais
	Excessive numbers of zeros	exz
	Failure of the far end	ferf
	Idle alarm	idle
	Line code violation	lcv
	Loss of frame	lof
	Loss of signal	los
	Phase-locked loop out of lock	pll
	Yellow alarm	ylw
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

- [Configuring the Junos OS to Determine Conditions That Trigger Alarms on Different Interface Types on page 431](#)

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 470](#)
- [Chassis Component Alarm Conditions on M5 and M10 Routers on page 434](#)
- [Chassis Component Alarm Conditions on M7i and M10i Routers on page 437](#)
- [Chassis Component Alarm Conditions on M20 Routers on page 442](#)
- [Chassis Component Alarm Conditions on M40 Routers on page 445](#)

- [Chassis Component Alarm Conditions on M40e and M160 Routers on page 450](#)
- [Chassis Component Alarm Conditions on M120 Routers on page 455](#)
- [Chassis Component Alarm Conditions on M320 Routers on page 460](#)
- [Chassis Component Alarm Conditions on MX Series 3D Universal Edge Routers on page 465](#)
- 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 35 on page 434 lists the alarms that the chassis components can generate on M5 and M10 routers.

Table 35: 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 www.juniper.net/ 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

Table 35: Chassis Component Alarm Conditions on M5 and M10 Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
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
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 35: Chassis Component Alarm Conditions on M5 and M10 Routers (continued)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
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 (fxp0 or em0) on the Routing Engine is down.	<ul style="list-style-type: none"> • Check the interface cable connection. • Reboot the system. • If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States) 	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 35: 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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Red
	The temperature sensor has failed.	<p>Open a support case using the Case Manager link at</p> <p>www.juniper.net/</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 36 on page 438 lists the alarms that the chassis components can generate on M7i and M10i routers.

Table 36: 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 http://www.juniper.net/support/ 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 36: 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 36: 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 (fxp0 or em0) on the Routing Engine is down.		Red

Table 36: Chassis Component Alarm Conditions on M7i and M10i Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		<ul style="list-style-type: none"> • Check the interface cable connection. • Reboot the system. • If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States) 	
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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at http://www.juniper.net/support/ 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 37 on page 442 lists the alarms that the chassis components can generate on M20 routers.

Table 37: 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 http://www.juniper.net/support/ 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 37: 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 (fxp0 or em0) on the Routing Engine is down.		Red

Table 37: Chassis Component Alarm Conditions on M20 Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		<ul style="list-style-type: none"> • Check the interface cable connection. • Reboot the system. • If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States) 	
	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 37: 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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at http://www.juniper.net/support/ 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 38 on page 445 lists the alarms that the chassis components can generate on M40 routers.

Table 38: Chassis Component Alarm Conditions on M40 Routers

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Air filter	Change air filter.	Change air filter.	Yellow

Table 38: 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 http://www.juniper.net/support/ 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 38: 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 38: 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 (fxp0 or em0) on the Routing Engine is down.		Red

Table 38: Chassis Component Alarm Conditions on M40 Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		<ul style="list-style-type: none"> • Check the interface cable connection. • Reboot the system. • If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States) 	
SCB	The System Control Board (SCB) has failed. If this occurs, the board attempts to reboot.	Replace failed SCB.	Red

Table 38: 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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at http://www.juniper.net/support/ 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 39 on page 451 lists the alarms that the chassis components can generate on M40e and M160 routers.

Table 39: 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
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 http://www.juniper.net/support/ 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 39: 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 39: 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 (fxp0 or em0) on the Routing Engine is down.		Red

Table 39: Chassis Component Alarm Conditions on M40e and M160 Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		<ul style="list-style-type: none"> • Check the interface cable connection. • Reboot the system. • If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States) 	
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 39: 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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at http://www.juniper.net/support/ 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 40 on page 455 lists the alarms that the chassis components can generate on M120 routers.

Table 40: Chassis Component Alarm Conditions on M120 Routers

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Air filters	Change air filter.	Change air filter.	Yellow

Table 40: 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 http://www.juniper.net/support/ 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 Ethernet switch has failed.	Replace failed CB.	Yellow
	A CB has been removed.	Insert CB into empty slot.	Red
	A CB has failed.	Replace failed CB.	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
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 40: 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 40: 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 (fxp0 or em0) on the Routing Engine is down.		Red

Table 40: Chassis Component Alarm Conditions on M120 Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		<ul style="list-style-type: none"> • Check the interface cable connection. • Reboot the system. • If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States) 	

Table 40: 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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at http://www.juniper.net/support/ 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 41 on page 461 lists the alarms that the chassis components can generate on M320 routers.

Table 41: 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 http://www.juniper.net/support/ 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 41: 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 41: 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	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 (fxp0 or em0) on the Routing Engine is down.		Red

Table 41: Chassis Component Alarm Conditions on M320 Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		<ul style="list-style-type: none"> • Check the interface cable connection. • Reboot the system. • If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States) 	
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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Yellow

Table 41: 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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at http://www.juniper.net/support/ 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 3D Universal Edge Routers

Table 42 on page 465 lists the alarms that the chassis components can generate on MX Series 3D Universal Edge routers.

Table 42: Chassis Component Alarm Conditions on MX Series 3D Universal Edge Routers

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Air filters	Change air filter.	Change air filter.	Yellow

Table 42: Chassis Component Alarm Conditions on MX Series 3D Universal Edge 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 http://www.juniper.net/support/ 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 42: Chassis Component Alarm Conditions on MX Series 3D Universal Edge 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 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 42: Chassis Component Alarm Conditions on MX Series 3D Universal Edge 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 (fxp0 or em0) on the Routing Engine is down.		Red

Table 42: Chassis Component Alarm Conditions on MX Series 3D Universal Edge Routers (*continued*)

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		<ul style="list-style-type: none"> • Check the interface cable connection. • Reboot the system. • If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States) 	
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 42: Chassis Component Alarm Conditions on MX Series 3D Universal Edge 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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	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"> • Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan. 	Red
	The temperature sensor has failed.	Open a support case using the Case Manager link at http://www.juniper.net/support/ 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 43 on page 471 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 43: 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 http://www.juniper.net/support/ 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 (fxp0 or em0) on the backup Routing Engine is down.	<ul style="list-style-type: none"> Check the interface cable connection. Reboot the system. If the alarm recurs, open a support case using the Case Manager link at http://www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States) 	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 http://www.juniper.net/support/ 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 43: 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"> Reboot the system with the board reset button on the backup Routing Engine. If the alarm recurs, open a support case using the Case Manager link at www.juniper.net/support/ or call 1-888-314-JTAC (within the United States) or 1-408-745-9500 (from outside the United States) 	Yellow

Related Documentation

- [Silencing External Devices Connected to Alarm Relay Contacts on page 472](#)

Silencing External Devices Connected to Alarm Relay Contacts

You can manually silence external devices connected to alarm relay contacts. To silence an external devices, 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 the Junos OS to Determine Conditions That Trigger Alarms on Different Interface Types on page 431](#)
- [Configuring the Junos OS to Disable the Physical Operation of the Craft Interface on page 425](#)

CHAPTER 25

Examples

- [Examples: Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs on MX Series Routers on page 473](#)
- [Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC on page 475](#)
- [Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 476](#)
- [Example: Configuring Tunnel Interfaces on the MPC3E on page 476](#)
- [Example: Configuring Fabric Redundancy Mode on MPC4E on page 478](#)
- [Example: Configuring the License Mode for MPC5E on page 480](#)
- [Example: Configuring Centralized Clocking on the Enhanced MX Switch Control Board on page 484](#)
- [Example: Configuring Centralized Clocking on an MX2020 on page 493](#)
- [Example: Configuring a T4000 Chassis to Represent a T640 Chassis on page 502](#)
- [Example: Configuring FPC Error Detection and Self-Healing on T Series Core Routers on page 505](#)

Examples: Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs on MX Series Routers

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 473](#)
- [Configuring Symmetrical Hashing for family inet on Both Routers on page 474](#)
- [Configuring Symmetrical Hashing for family inet and family multiservice on the Two Routers on page 475](#)

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 269](#)

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 324](#)
- [Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 476](#)
- [Example: Configuring Tunnel Interfaces on the MPC3E on page 476](#)

- [bandwidth \(Tunnel Services\) on page 533](#)
- [tunnel-services on page 690](#)
- [\[edit chassis\] Hierarchy Level](#)

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 475](#)
- [Example: Configuring Tunnel Interfaces on the MPC3E on page 476](#)
- [bandwidth \(Tunnel Services\) on page 533](#)
- [tunnel-services on page 690](#)
- [\[edit chassis\] Hierarchy Level](#)

Example: Configuring Tunnel Interfaces on the MPC3E

- [Requirements for Configuration of Tunnel Interfaces on the MPC3E on page 476](#)
- [Ethernet Tunnel Configuration Overview on page 476](#)
- [Configuring a 20-Gigabit Ethernet Tunnel on page 477](#)
- [Configuring a Tunnel With Unspecified Bandwidth on page 477](#)

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 475](#)
- [Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 476](#)
- [bandwidth \(Tunnel Services\) on page 533](#)
- [tunnel-services on page 690](#)
- [\[edit chassis\] Hierarchy Level](#)
- [Configuring Tunnel Interfaces on MX Series Routers](#)

Example: Configuring Fabric Redundancy Mode on MPC4E

- [Requirements for Configuration of the Fabric Redundancy Mode on MPC4E on page 478](#)
- [Overview on page 478](#)
- [Configuring Increased Bandwidth Mode on page 478](#)
- [Verification on page 479](#)

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 479](#)
- [Verifying the Number of Active Fabric Planes on page 479](#)

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 Management on MPC4E Overview on page 22](#)
 - [show chassis fabric destinations on page 1108](#)
 - [show chassis fabric fpcs on page 1125](#)
 - [show chassis fabric plane on page 1183](#)
 - [show chassis fabric summary on page 1250](#)

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 480](#)
- [Overview on page 481](#)
- [Configuration on page 481](#)
- [Verification on page 483](#)

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 481](#)
- [Deleting the License Mode for MPC5E in Slot 4 on page 482](#)
- [Configuring the License Mode for MPC5E in Slot 2 on page 482](#)

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 483](#)
- [Verifying That the Configured License Mode Is Deleted on page 483](#)
- [Verifying That the License Mode Is Configured for MPC5E in Slot 2 on page 484](#)

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 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 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
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
...

```

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
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 2.

- Related Documentation**
- [License Modes for Enhanced MPCs Overview on page 24](#)
 - [Configuring the License Mode for Specific Enhanced MPCs on MX Series Routers on page 289](#)

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 485](#)
- [Overview on page 485](#)
- [Configuration on page 486](#)
- [Verification on page 490](#)

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 MX240, MX480, MX960, MX2010, and MX2020 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

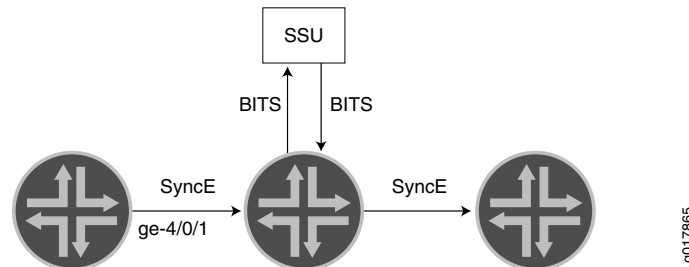
With the addition of a Stratum 3 clock module to the SCBE, an MX240, MX480, or MX960 chassis can perform clock monitoring, filtering, and holdover in a centralized chassis location. Chassis line cards can be configured to recover network timing clocks at the physical layer via Synchronous Ethernet or 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 MX240, MX480, MX960, MX2010, and MX2020 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 OCXO 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 6 on page 486](#) 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 488](#).

Figure 6: 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 486](#)
- [Configuring Centralized Clocking from an Ordinary PTP Clock Source on page 487](#)
- [Configuring Centralized Clocking from a Hybrid PTP Clock Source on page 487](#)
- [Configuring Retiming through the BITS External Interface on page 488](#)

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 379](#).

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 490](#)
- [Verifying the Ordinary PTP Clock Source on page 491](#)
- [Verifying the Hybrid PTP Clock Source on page 491](#)
- [Verifying the Retiming through the BITS External Interface on page 492](#)

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 672](#)
- [show chassis synchronization \(MX Series Routers\) on page 1678](#)
- [Example: Configuring Precision Time Protocol on page 379](#)
- [Configuring Hybrid Mode and ESMC Quality Level Mapping on page 385](#)
- [Precision Time Protocol Overview on page 163](#)

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 493](#)
- [Overview on page 493](#)
- [Configuration on page 494](#)
- [Verification on page 499](#)

Requirements

These examples use the following hardware and software components:

- One MX2020, with MPC 16x10GE or MPC2Es (see *MPCs Supported by MX240, MX480, MX960, MX2010, and MX2020 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 MX240, MX480, MX960, MX2010, and MX2020 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 488](#).

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 494](#)
- [Configuring an ordinary PTP Clock Source on page 495](#)
- [Configuring Centralized Clocking from a Hybrid Mode PTP Clock Source on page 495](#)
- [Configuring Hybrid Mode PTP on page 496](#)
- [Configuring Retiming through the BITS External Interface on page 497](#)

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 379](#).

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 496](#).

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 499](#)
- [Verifying the Ordinary PTP Clock Source on page 500](#)
- [Verifying the Hybrid PTP Clock Source on page 500](#)
- [Verifying the Retiming through the BITS External Interface on page 501](#)

### 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 672](#)
 - [show chassis synchronization \(MX Series Routers\) on page 1678](#)
 - [Example: Configuring Precision Time Protocol on page 379](#)
 - [Configuring Hybrid Mode and ESMC Quality Level Mapping on page 385](#)
 - [Precision Time Protocol Overview on page 163](#)

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 502](#)
- [Overview on page 502](#)
- [Configuring the T4000 Chassis to Represent a T640 Chassis on page 503](#)
- [Verification on page 503](#)

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	201101050335CCFACCF	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              JN11B3892AHA  T640
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 304](#)
 - [oss-map on page 625](#)
 - [show chassis oss-map on page 1569](#)
 - [Understanding Operations Support Systems Mapping on page 36](#)

Example: Configuring FPC Error Detection and Self-Healing on T Series Core Routers

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 505](#)
- [Overview on page 505](#)
- [Configuration on page 505](#)
- [Verification on page 509](#)

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 507](#)
- [Results on page 509](#)

- 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 509](#)

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	<pre>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 |</pre>
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	<ul style="list-style-type: none"> • fpc error on page 574 • show chassis fpc errors on page 1362

CHAPTER 26

Configuration Statements

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Router Chassis Configuration Statements

You can configure properties of the router chassis, including conditions that activate the red and yellow alarm LEDs and SONET/SDH framing and concatenation properties for individual Physical Interface Cards (PICs).

To configure router chassis properties, include the following statements at the **[edit chassis]** hierarchy level:



NOTE: Statements at the **[edit chassis redundancy]** hierarchy level are described in the *Junos OS High Availability Library for Routing Devices*.

chassis {


```

aggregated-devices {
  ethernet {
    device-count number;
    lacp {
      system-priority;
      link-protection;
    }
  }
  sonet {
    device-count number;
  }
}
alarm {
  interface-type {
    alarm-name (red | yellow | ignore);
  }
}
fabric {
  degraded {
    action-fpc-restart-disable;
    degraded-fabric-detection-enable
    degraded-fpc-bad-plane-threshold number-bad-planes;
  }
  redundancy-mode (increased-bandwidth | redundant);
}
feb
  slot number
    ucode-imem-remap
  {
}
fpc slot-number {
  allow-sram-parity-errors;
  offline-on-fabric-bandwidth-reduction
  port-mirror-instance port-mirroring-instance-name;
  sampling-instance;
  route-localization {
    fib-local;
    fib-remote;
  }
  power (off | on);
  ir-mode (IR | R);
  pic pic-number {
    port-mirror-instance port-mirroring-instance-name;
    framing (t1 | e1);
    port port-number {
      forwarding-mode {
        sa-multicast;
      }
      speed (oc3-stm1 | oc12-stm4 | oc48-stm16);
    }
  }
  adaptive-services {
    service-package (layer-2 | layer-3);
  }
  aggregate-ports;
  atm-cell-relay-accumulation;
  atm-l2circuit-mode (cell | aal5 | trunk trunk);
}

```

```

vtmapping number;
cel {
    el port-number {
        channel-group channel-number timeslots slot-number;
    }
}
channelization;
ct3 {
    port port-number {
        tl link-number {
            channel-group channel-number timeslots slot-number;
        }
    }
}
egress-policer-overhead bytes;
forwarding-mode {
    sa-multicast;
    vlan-steering {
        vlan-rule (high-low | odd-even);
    }
}
framing (sdh | sonet);
fru-poweron-sequence;
idle-cell-format {
    itu-t;
    payload-pattern payload-pattern-byte;
}
ingress-policer-overhead bytes;
linerate-mode;
max-queues-per-interface (8 | 4);
mlfr-uni-nni-bundles number;
number-of-ports;
no-concatenate;
no-multi-rate;
q-pic-large-buffer {
    large-scale;
    small-scale;
}
red-buffer-occupancy {
    weighted-averaged [ instant-usage-weight-exponent weight-value ];
}
sparse-dlcis;
traffic-manager {
    egress-shaping-overhead number;
    ingress-shaping-overhead number;
    mode {
        egress-only;
        ingress-and-egress;
        session-shaping;
    }
}
tunnel-services {
    bandwidth (1g | 10g);
    vtmapping (itu-t | klm);
}
}

```

```

fpc-resync;
fpc-feb-connectivity {
    fpc slot-number feb (slot-number | none);
}
lcc number {
    fpc number {
        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;
            }
            linerate-mode;
            max-queues-per-interface (8 | 4);
            no-concatenate;
            no-mcast-replication;
            hash-key {
                family {
                    inet {
                        layer-3;
                        layer-4;
                        symmetric-hash {
                            complement;
                        }
                    }
                }
                multiservice {
                    source-mac;
                    destination-mac;
                    payload {
                        ip {
                            layer-3;
                            layer-4;
                        }
                    }
                    symmetric-hash {
                        complement;
                    }
                }
            }
        }
    }
}
pem {
    feeds number-of-input-feeds;
}
maximum-ecmp;
offline;
online-expected;
sampling-instance;
}
lcc-mode {
    lcc number {
        mode mode;
    }
}

```

```

}
memory-enhanced{
  filter;
  route;
  vpn-label;
}
(packet-scheduling | no-packet-scheduling);
pem {
  minimum number;
  feeds number-of-input-feeds;
  input-current amps-in-each-feed;
}
no-concatenate;
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;
    }
  }
  port-mirror-instance port-mirroring-instance-name;
  graceful-switchover;
  keepalive-time seconds;
  routing-engine slot-number (master | backup | disabled);
  sfm slot-number (always | preferred);
  ssb slot-number (always | preferred);
}
network-services (ethernet | enhanced-ethernet | ip | enhanced-ip);
route-localization {
  inet;
  inet6;
}
routing-engine {
  on-disk-failure {
    disk-failure-action (halt | reboot);
  }
}
sfm slot-number {
  power off;
}
sib {
  minimum number;
}
vrf-mtu-check;
vtmapping (itu-t | klm);
synchronization {
  signal-type (e1 | t1);
  switching-mode (revertive | non-revertive);
  y-cable-line-termination;
  transmitter-enable;
}

```

```

validation-interval seconds;
primary (external-a | external-b);
secondary (external-a | external-b);
}
}

```



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 205](#) and the *TX Matrix Router Hardware Guide*. For information about a routing matrix composed of a TX Matrix Plus router and T1600 routers, see [“TX Matrix Plus Router Configuration Overview” on page 210](#) and the *TX Matrix Plus Router Hardware Guide*.

`[edit chassis satellites]` Hierarchy Level

```

chassis {
  satellites {
    satellite-name ;
  }
}

```

The configuration sections of `chassis jnu-management` and `chassis satellites` at the `[edit]` hierarchy level are configurable only when the controller system is in JNU controller mode. You must specify the model and the Junos OS release version that each of the satellite is running so that the controller can identify the corresponding satellite configuration schema to use. After these configurations are set, the satellite configuration schema is available under the `[edit chassis satellites satellite-name]` hierarchy level. The configuration settings of satellites and satellite operational command settings are supported for being merged to the controller.

The JNU satellite schema directory is saved at a centralized directory, `/var/run/db/schema/platform/release/`. When the satellite configuration and operational command is imported on the controller, it creates the `schema.db` file in this directory. For example, `/var/run/db/schema/ex4200/12.1R3.5/schema.db` is such a schema. These schemata are referenced under the `[edit chassis satellites]` hierarchy level but are not merged into the controller `schema.db` file.

Related Documentation

- [Notational Conventions Used in Junos OS Configuration Hierarchies](#)

`[edit chassis jnu-management]` Hierarchy Level

```

chassis {
  jnu-management {
    satellites {
      satellite satellite-name model model-number release release-number enforce;
    }
  }
}

```

}

Related Documentation

- [Notational Conventions Used in Junos OS Configuration Hierarchies](#)

[edit protocols ptp] Hierarchy Level

```

protocols {
  ptp {
    clock-mode (boundary | ordinary);
    domain domain-value;
    master {
      announce-interval announce-interval-value;
      clock-step (one-step | two-step);
      interface interface-name {
        unicast-mode {
          clock-client ip-address {
            local-ip-address local-ip-address;
          }
          transport ipv4;
        }
      }
      sync-interval sync-interval-value;
    }
    priority1 priority1-value;
    priority2 priority2-value;
    slave {
      announce-timeout announce-timeout-value;
      delay-request delay-request-value;
      frequency-only;
      interface interface-name {
        unicast-mode {
          clock-source ip-address {
            local-ip-address local-ip-address;
          }
          transport ipv4;
        }
      }
    }
    unicast-negotiation;
  }
}

```

Related Documentation

- [\[edit protocols\] Hierarchy Level](#)
- [Configuring Precision Time Protocol on page 375](#)
- [Example: Configuring Precision Time Protocol on page 379](#)
- [Notational Conventions Used in Junos OS Configuration Hierarchies](#)
- [Precision Time Protocol Overview on page 163](#)
- [IEEE 1588v2 Precision Timing Protocol \(PTP\) on ACX Series Universal Access Routers](#)

account-layer2-overhead (PIC Level)

Syntax	account-layer2-overhead;
Hierarchy Level	[edit chassis fpc slot-number pic pic-number]
Release Information	Statement introduced in Junos OS Release 13.2.
Description	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.
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"> • Accounting of the Layer 2 Overhead Attribute in Interface Statistics on page 293 • Configuring Layer 2 Overhead Accounting in Interface Statistics on page 295 • Verifying the Accounting of Layer 2 Overhead in Interface Statistics on page 296 • [edit chassis] Hierarchy Level

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	<ul style="list-style-type: none"> • Disabling FPC Restart on page 412 • Traffic Black Hole Caused by Fabric Degradation on page 401

adaptive-services

Syntax	<code>adaptive-services { (layer-2 | layer-3); }</code>
Hierarchy Level	<code>[edit chassis fpc slot-number pic pic-number]</code>
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.
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">• Configuring the Junos OS to Enable Service Packages on Adaptive Services Interfaces on page 349• Configuring the Junos OS to Support Layer 2 Services on MX Series 3D Universal Edge Routers with MS-DPCs on page 291• Junos Services Interfaces Configuration Guide• Junos OS, Release 15.1

aggregate-ports

Syntax	<code>aggregate-ports;</code>
Hierarchy Level	<code>[edit chassis fpc slot-number pic pic-number]</code>
Release Information	Statement introduced in Junos OS Release 8.1.
Description	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.
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">• Configuring 4-Port OC192 PIC to Operate in OC768-over-OC192 Mode

aggregated-devices

Syntax	<pre> aggregated-devices { ethernet { device-count <i>number</i>; lacp { link-protection { non-revertive; } system-priority; } } sonet { device-count <i>number</i>; } maximum-links <i>maximum-links-limit</i>; } </pre>
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.
Options	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	<ul style="list-style-type: none"> • Configuring Junos OS for Supporting Aggregated Devices on page 335

alarm

Syntax	<pre>alarm { interface-type { alarm-name (red | yellow | ignore); } }</pre>
Hierarchy Level	[edit chassis], [edit chassis interconnect-device <i>name</i>], [edit chassis node-group <i>name</i>]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 11.1 for the QFX Series. Statement introduced in Junos OS Release 12.2 for the ACX Series. Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
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 RED ALARM 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 YELLOW ALARM 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 Table 34 on page 432.</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: atm, ethernet, sonet, or t3.</p> <p>red—The specified alarm condition sets off a red alarm.</p> <p>yellow—The specified alarm condition sets off a yellow alarm.</p>
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">• Understanding Alarms• Chassis Conditions That Trigger Alarms on page 433• Chassis Alarm Messages on a QFX3500 Device• Interface Alarm Messages

allow-sram-parity-errors

Syntax	allow-sram-parity-errors;
Hierarchy Level	[edit chassis fpc <i>slot-number</i>]
Release Information	Statement introduced in Junos OS Release 8.0.
Description	(T Series routers only) Allow SRAM parity errors to occur without restarting the FPC.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.

announce-timeout

Syntax	announce-timeout <i>announce-timeout-value</i> ;
Hierarchy Level	[edit protocols ptp slave]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	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.
Options	<i>announce-timeout-value</i> —The announce timeout value for announce interval messages. Range: 2 through 10 Default: 3
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"> • Configuring Precision Time Protocol on page 375 • Example: Configuring Precision Time Protocol on page 379 • Precision Time Protocol Overview on page 163

announce-interval

Syntax	<code>announce-interval <i>announce-interval-value</i>;</code>
Hierarchy Level	[edit protocols ptp master]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	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.
Options	<i>announce-interval-value</i> —The announce interval value for the announce messages. Range: 0 through 4 Default: 1
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">• Configuring Precision Time Protocol on page 375• Example: Configuring Precision Time Protocol on page 379• Precision Time Protocol Overview on page 163

asymmetry

Syntax	<code>asymmetry <i>number</i></code>
Hierarchy Level	<p>For ACX Series:</p> <pre>[edit protocols ptp slave interface <i>unicast-mode</i> 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>
Release Information	Statement introduced in Junos OS Release 15.1 for MX Series routers.
Description	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.
Options	number —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.
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"> • <i>IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers</i> • Precision Time Protocol Overview on page 163 • Configuring Precision Time Protocol on page 375 • Example: Configuring Precision Time Protocol on page 379

atm-cell-relay-accumulation

Syntax	atm-cell-relay-accumulation;
Hierarchy Level	[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)
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure an Asynchronous Transfer Mode (ATM) Physical Interface Card (PIC) in cell-relay accumulation mode.
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">• Configuring the Junos OS to Use ATM Cell-Relay Accumulation Mode on an ATM1 PIC on page 319

atm-l2circuit-mode

Syntax	atm-l2circuit-mode (cell | aal5 | trunk <i>trunk</i>);
Hierarchy Level	[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)
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure the ATM2 intelligent queuing (IQ) Layer 2 circuit transport mode.
Default	aal5
Options	<p>aal5—Tunnel a stream of ATM cells encoded with ATM Adaptation Layer (AAL5) over an IP Multiprotocol Label Switching (MPLS) backbone.</p> <p>cell—Tunnel a stream of ATM cells over an IP MPLS backbone.</p> <p>trunk <i>trunk</i>—Transport ATM cells over an MPLS core network that is implemented on some other vendor switches. Trunk mode can be UNI or NNI.</p>





NOTE: To determine which vendors support Layer 2 circuit trunk mode, contact Juniper Networks Customer Support.

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"> • Configuring the Junos OS to Enable ATM2 Intelligent Queuing Layer 2 Circuit Transport Mode on page 395


auto-recovery-disable

Syntax	auto-recovery-disable;
Hierarchy Level	[edit chassis fabric degraded]
Release Information	Statement introduced in Junos OS Release 14.2 for TX Matrix Plus routers with 3D SIBs.
Description	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 auto-recovery-disable statement from the existing configuration.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• show chassis fabric faults recovery-actions on page 1118

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.
Description	(MX Series 3D Universal Edge Routers and T4000 Core Routers only) Specify the amount of bandwidth in gigabits per second to reserve for tunnel services.
Options	<i>bandwidth-value</i> —Define the amount of bandwidth in gigabits per second to reserve for tunnel services. On MX Series routers, the bandwidth values can be 1g , 10g , 20g , or 40g . On T4000 routers, the bandwidth values are multiples of 10g up to 100g .
<div>  <p>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.</p> </div>	
<div>  <p>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.</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"> • Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC on page 475 • Configuring Tunnel Interfaces on MX Series Routers • Configuring Tunnel Interfaces on T4000 Routers • Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 476 • Example: Configuring Tunnel Interfaces on the MPC3E on page 476 • Configuring Layer 3 Tunnel Services Interfaces on an MX Series Router with a DPC • tunnel-services on page 690 • [edit chassis] Hierarchy Level

bandwidth-degradation

Syntax	<pre>bandwidth-degradation { action (log-only | restart | offline | restart-then-offline); no-fabric-switchover; percentage (1-99); }</pre>
Hierarchy Level	[edit chassis fpc <i>slot-number</i> fabric]
Release Information	Statement introduced in Junos OS Release 15.1.
Description	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> NOTE: This configuration statement is mutually exclusive with the offline-on-fabric-bandwidth-reduction statement. If both statements are configured, the commit check fails and returns an error.</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">• Managing Bandwidth Degradation to Prevent Traffic Black Holes on page 411• blackhole-action on page 534• offline-on-fabric-bandwidth-reduction on page 621

blackhole-action

Syntax	<pre>blackhole-action (log-only | restart | offline | restart-then-offline);</pre>
Hierarchy Level	[edit chassis fpc <i>slot-number</i> fabric]
Release Information	Statement introduced in Junos OS Release 15.1.
Description	Configure an FPC to take a specific action when fabric plane degradation reaches 100 percent.
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">• Managing Bandwidth Degradation to Prevent Traffic Black Holes on page 411• bandwidth-degradation on page 534

cel

Syntax	<pre>cel { e1 <i>port-number</i> { channel-group <i>channel-number</i> timeslots <i>slot-number</i>; } }</pre>
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure channelized E1 port and channel specifications.
Options	<p>e1 <i>port-number</i>—Any valid E1 port number on the host system.</p> <p>The remaining statements are explained separately.</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"> • Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 322

channel-group

Syntax	<code>channel-group <i>channel-number</i> timeslots <i>slot-number</i>;</code>
Hierarchy Level	<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>
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure the DS0 channel number.
Options	<p><i>channel-number</i>—DS0 channel group.</p> <p>Range: 0 through 7 for DS0 naming, and 0 through 23 for E1 naming.</p> <p><i>timeslots slot-number</i>—One or more actual time slot numbers allocated.</p> <p>Range: 1 through 24 for T1 and 1 through 32 for E1</p> <p>Default: All time slots for T1 and all time slots for E1</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">• Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 343• Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 322

channel-speed

Syntax	channel-speed (10g |40g) ;
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> (port <i>port-number</i>)
Release Information	Statement introduced in Junos OS Release 15.1X53D20 for the PTX1000 Packet Transport Router.
Description	Enable the specified port on the Physical Interface Card (PIC) to perform in the specified channel speed.
Default	40g (40-Gbps)
Options	10g—Set the channel speed to 10g (10-Gbps).
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<i>PTX1000 Port Panel</i>

channelization

Syntax	channelization;
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i>]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Enable the DS3/E3 MIC, MIC-3D-I6CHE1-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.
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"> • Configuring the Junos OS to Enable Channelization on DS3/E3 MIC on page 345


chassis

Syntax	chassis { ... }
Hierarchy Level	[edit]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure router chassis properties.
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">• Router Chassis Configuration Statements on page 516

chassis (Component Temperature Threshold)

Syntax	<code>chassis [fpc | sib | cb] <i>threshold action to take</i>;</code>
Hierarchy Level	[edit]
Release Information	Command introduced in Junos OS Release 15.1F3 for the PTX Series.
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 chassis [fpc|sib|cb] <i>threshold action to take</i> 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>fpc—FPC for which you are setting the temperature threshold</p> <p>sib—SIB for which you are setting the temperature threshold</p> <p>cb—Control board for which you are setting the temperature threshold</p> <p><i>threshold</i>—Temperature threshold setting, in degrees Celsius</p> <p><i>action to take</i>—Action that the system should take:</p> <ul style="list-style-type: none"> • fans-on-full-speed—Temperature threshold at which the component's fans run at full speed • fans-to-normal-speed—Temperature threshold at which the component's fans return to normal speed • fire-shutdown—Temperature threshold for the component, which causes the network device to shut down • red-alarm—Temperature threshold at which a red alarm is triggered • yellow-alarm—Temperature threshold at which a yellow alarm is triggered
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"> • show chassis environment on page 815 • show chassis environment fpc on page 910 • show chassis environment cb on page 890 • show chassis environment sib on page 1022 • show chassis fan on page 1092

chassis ambient-temperature

Syntax	chassis ambient-temperature 25C|40C|55C;
Hierarchy Level	edit
Release Information	Statement introduced in Junos OS Release 15.1
Description	<p>Set the chassis ambient temperature and instructs the power manager to allocate power to the line cards according to the ambient temperature value.</p> <p>On system initialization, the power manager reads the ambient temperature and allocates power to the line card according to the power budget policy at that temperature. In a PTX5000 packet transport router, 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 it with a CLI command. The power manager then resets the power budget of the FRUs according to the configured ambient temperature setting. This behavior is specific to the PTX5000 packet transport router.</p>
	<div> NOTE: If the ambient temperature is not set, 40° C is the default ambient temperature and the line cards are assigned power according to the default ambient temperature.</div>
Options	<p>25C —Set the ambient temperature of the chassis to 25°C</p> <p>40C —Set the ambient temperature of the chassis to 40°C</p> <p>55C —Set the ambient temperature of the chassis to 55°C</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">• Managing Power Allocated to PTX5000 FPCs on the Basis of Chassis Ambient Temperature Configuration on page 33• Monitoring the Power Consumption of PTX5000 FPCs by Configuring the Ambient Temperature on page 309

clock-class

Syntax	<code>clock-class <i>clock-class-value</i>;</code>
Hierarchy Level	[edit protocols ptp slave clock-class-to-quality-level-mapping]
Release Information	Statement introduced in Junos OS Release 12.2R2.
Description	Configure the clock class to the set ESMC quality level.
Default	Following are the default clock class values for various clocks: <ul style="list-style-type: none">• Boundary clock—248• Ordinary clock (master)—52• Ordinary clock (slave)—255
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">• Configuring Hybrid Mode and ESMC Quality Level Mapping on page 385• Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 388• Understanding Hybrid Mode on page 191• Precision Time Protocol Overview on page 163• Synchronous Ethernet Overview on page 149


clock-class-to-quality-level-mapping

Syntax	<pre>clock-class-to-quality-level-mapping { clock-class clock-class-value; { quality-level ql-value; } }</pre>
Hierarchy Level	[edit protocols ptp slave]
Release Information	Statement introduced in Junos OS Release 12.2R2.
Description	<p>Configure the slave to override the default Precision Time Protocol (PTP) clock class to Ethernet Synchronization Message Channel (ESMC) mapping.</p> <p>The remaining statements are explained separately.</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">• Configuring Hybrid Mode and ESMC Quality Level Mapping on page 385• Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 388• Understanding Hybrid Mode on page 191• Precision Time Protocol Overview on page 163• Synchronous Ethernet Overview on page 149


clock-source (slave)

Syntax	<code>clock-source <i>ip-address</i> { <i>local-ip-address</i> <i>local-ip-address</i>; }</code>
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	<i>ip-address</i> —IP address for the master. The remaining statements are explained separately.
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">• Configuring Precision Time Protocol on page 375• Example: Configuring Precision Time Protocol on page 379• Precision Time Protocol Overview on page 163

clock-source (hybrid)

Syntax	<code>clock-source <i>ip-address</i> { interface <i>interface1-name</i>; interface <i>interface2-name</i>; }</code>
Hierarchy Level	[edit protocols ptp slave hybrid synchronous-ethernet-mapping]
Release Information	Statement introduced in Junos OS Release 12.2R2.
Description	Configure the IP address of the PTP master and its possible Synchronous Ethernet source interfaces.
Options	<p>interface <i>interface1-name</i>—Synchronous Ethernet interface traceable to the same PTP master clock.</p> <p>interface <i>interface2-name</i>—Synchronous Ethernet interface traceable to the same PTP master clock.</p>
<div> NOTE: You must first configure these interfaces at the [edit chassis synchronization] hierarchy level as Synchronous Ethernet sources. For information about configuring the interfaces, see synchronization (MX Series).</div>	
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">• Configuring Hybrid Mode and ESMC Quality Level Mapping on page 385• Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 388• Understanding Hybrid Mode on page 191• Precision Time Protocol Overview on page 163• Synchronous Ethernet Overview on page 149

clock-mode

Syntax	clock-mode (boundary | ordinary);
Hierarchy Level	[edit protocols ptp]
Release Information	Statement introduced in Junos OS Release 12.2. Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers.
Description	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.
Options	boundary —The clock mode of the node is a boundary clock where the clock acts as both master and slave.
<div>  NOTE: A boundary clock is not supported on the ACX Series routers for 12.2. </div>	
	ordinary —The clock mode of the node is a system clock where the clock acts either as a master or as a 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"> • Configuring Precision Time Protocol on page 375 • Example: Configuring Precision Time Protocol on page 379 • Precision Time Protocol Overview on page 163 • <i>IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers</i>

clock-mode (Clock Synchronization)

Syntax	<code>clock-mode (auto-select | free-run);</code>
Hierarchy Level	[edit chassis synchronization]
Release Information	Statement introduced in Junos OS Release 11.2R4 for MX Series routers.
Description	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.
Default	auto-select
Options	auto-select —Select the best external clock source as a clock source. free-run —Select the free-run local oscillator as a clock source.
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">• synchronization on page 672

clock-client

Syntax	<code>clock-client <i>ip-address</i>;</code>
Hierarchy Level	[edit protocols ptp master interface <i>interface-name</i> unicast-mode transport ipv4]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	Configure the IP address of the slave.
Options	<i>ip-address</i> —The IP 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">• Configuring Precision Time Protocol on page 375• Example: Configuring Precision Time Protocol on page 379• Precision Time Protocol Overview on page 163

clock-step

Syntax	clock-step (one-step | two-step);
Hierarchy Level	[edit protocols ptp master]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	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.
Options	<p>one-step—One clock step to send timing information along with the synchronous message.</p> <p>two-step—Two clock steps to send timing information and receive a subsequent follow-up message.</p> <p>Default: one-step</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">• Configuring Precision Time Protocol on page 375• Example: Configuring Precision Time Protocol on page 379• Precision Time Protocol Overview on page 163

convert-clock-class-to-quality-level

Syntax	convert-clock-class-to-quality-level;
Hierarchy Level	[edit protocols ptp slave]
Release Information	Statement introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers. Statement introduced in Junos OS Release 12.2R2 for MX Series 3D Universal Edge Routers.
Description	<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>
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">• Configuring Hybrid Mode and ESMC Quality Level Mapping on page 385• Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 388• Precision Time Protocol Overview on page 163• Synchronous Ethernet Overview on page 149• Understanding ESMC Quality Level Mapping on page 183• Understanding Hybrid Mode on page 191

craft-lockout

Syntax	craft-lockout;
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 8.1.
Description	Disable the physical operation of the craft interface front panel.
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">• Configuring the Junos OS to Disable the Physical Operation of the Craft Interface on page 425

ct3

Syntax	<pre> ct3 { port <i>port-number</i> { t1 <i>link-number</i> { channel-group <i>channel-number</i> timeslots <i>slot-number</i>; } } } </pre>
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure channelized T3 port and channel specifications.
Options	<p>port <i>port-number</i>—Any valid T3 port number on the host system.</p> <p>t1 <i>link-number</i>—T1 link.</p> <p>Range: 0 through 27</p> <p>The remaining statements are explained separately.</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"> • Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 343

degraded

Syntax	<pre>degraded { action-fpc-restart-disable; degraded-fabric-detection-enable; degraded-fpc-bad-plane-threshold <i>number-bad-planes</i>; }</pre>
Hierarchy Level	[edit chassis fabric degraded]
Release Information	Statement introduced in Junos OS Release 11.4. Statement introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Routers.
Description	Configure options that apply to degraded chassis fabric conditions.
Options	The 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	<ul style="list-style-type: none">• Traffic Black Hole Caused by Fabric Degradation on page 401• Disabling FPC Restart on page 412

degraded-fabric-detection-enable

Syntax	<pre>degraded-fabric-detection-enable;</pre>
Hierarchy Level	[edit chassis fabric degraded]
Release Information	Statement introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Routers.
Description	Enable detection of an FPC with degraded fabric.
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">• Traffic Black Hole Caused by Fabric Degradation on page 401• Disabling FPC Restart on page 412


degraded-fpc-bad-plane-threshold

Syntax	<code>degraded-fpc-bad-plane-threshold <i>number-bad-planes</i>;</code>
Hierarchy Level	[edit chassis fabric degraded]
Release Information	Statement introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Routers.
Description	Configure the number of bad planes that indicate an FPC is degraded.
Options	number-bad-planes —Number of bad planes. Range: 4 through 18 Default: 4
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"> • Traffic Black Hole Caused by Fabric Degradation on page 401 • Disabling FPC Restart on page 412

delay-request

Syntax	<code>delay-request <i>delay-request-value</i>;</code>
Hierarchy Level	[edit protocols ptp slave] [edit protocols ptp slave (ACX Series)]
Release Information	Statement introduced in Junos OS Release 12.2. Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers.
Description	Configure the logarithmic mean interval in seconds between the delay request messages sent by the slave to the master.
Options	<i>delay-request-value</i> —The delay request value for the delay request messages. Range: -6 through +6 Default: 0
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"> • Configuring Precision Time Protocol on page 375 • Example: Configuring Precision Time Protocol on page 379 • Precision Time Protocol Overview on page 163

device-count

Syntax	<code>device-count <i>number</i>;</code>
Hierarchy Level	[edit chassis aggregated-devices ethernet] [edit chassis aggregated-devices sonet]
Release Information	Statement introduced before Junos OS Release 7.4. Statement functionality updated in Junos OS Release 14.2, as described below.
Description	<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>
Options	<i>number</i> —Set the number of aggregated logical devices that will be available for configuration.
<div> NOTE: 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.</div>	
Range: 1 - 496. The upper limit for this value is system specific.	
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">• Configuring Junos OS for Supporting Aggregated Devices on page 335• Configuring Aggregated SONET/SDH Interfaces

disk-failure-action

Syntax	disk-failure-action (halt | reboot);
Hierarchy Level	[edit chassis routing-engine on-disk-failure]
Release Information	Statement introduced in Junos OS Release 9.0.
Description	Configure the Routing Engine to halt or reboot when the Routing Engine hard disk fails.
Options	halt —Specify the Routing Engine to halt. reboot —Specify the Routing Engine to reboot.
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"> • Configuring the Junos OS to Enable a Routing Engine to Reboot on Hard Disk Errors on page 416

domain

Syntax	domain <i>domain-value</i> ;
Hierarchy Level	[edit protocols ptp]
Release Information	Statement introduced in Junos OS Release 12.2. Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers.
Description	Configure multiple independent Precision Time Protocol (PTP) domains.



NOTE: Only one PTP domain is supported at any given point in time.

Options	domain-value —The PTP domain value. Range: 0 through 127 Default: 0
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"> • Configuring Precision Time Protocol on page 375 • Example: Configuring Precision Time Protocol on page 379 • Precision Time Protocol Overview on page 163

dynamic-profile-options

Syntax	<code>dynamic-profile-options { versioning; }</code>
Hierarchy Level	<code>[edit system]</code>
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure global dynamic profile options. The remaining statement is explained separately.
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">• Enabling Dynamic Profiles to Use Multiple Versions


e1

Syntax	<code>e1 <i>port-number</i> { channel-group <i>channel-number</i> timeslots <i>slot-number</i>; }</code>
Hierarchy Level	<code>[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> ce1]</code>
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure the channelized E1 port number on the PIC. The range is from 0 through 9.
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">• Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 322

e1-options (Clock Synchronization)

Syntax	<pre>e1-options { framing (g704 | g704-no-crc4); line-encoding (ami | hdb3); sabit <i>bit</i>; }</pre>
Hierarchy Level	[edit chassis synchronization interfaces external] [edit chassis synchronization interfaces (external-0/0 | external-1/0)]
Release Information	Statement introduced in Junos OS Release 12.3 for MX Series routers.
Description	Configure the E1 interface options.
Options	The 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	<ul style="list-style-type: none">• synchronization on page 672

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>NOTE: This statement is not supported on Modular Interface Cards (MICs) or Modular Port Concentrators (MPCs) in MX Series routers.</p> </div>
Options	<p>bytes—Number of bytes added to a packet exiting an interface.</p> <p>Range: 0–255 bytes</p> <p>Default: 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"> • egress-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 328 • CoS on Enhanced IQ2 PICs Overview

enhanced-mode (Network Services)

Syntax	enhanced-mode;
Hierarchy Level	[edit chassis network-services]
Release Information	Statement introduced in Junos OS Release 12.3 for T4000 Core Routers with Type 5 FPCs. Statement introduced in Junos OS Release 15.1F3 for PTX Series Routers with third-generation FPCs.
Description	T4000 Routers—When you configure enhanced-mode, 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.

PTX Series Routers—When you configure **enhanced-mode**, the following features are enabled on the router:

- Filter-based generic routing encapsulation (GRE) for IPv4 and IPv6 tunneling.
- **promote gre-key** statement for configuring gre-key as one of the matches in a filter.
- **gtp-tunnel-endpoint-identifier** statement for including hash calculation for IPv4 or IPv6 packets in the GPRS tunneling protocol—Tunnel end point ID (GTP-TEID) field hash calculations.
- Wider configuration range for Bidirectional Forwarding Detection (BFD) protocol intervals.
- Support for up to two million routes per chassis.
- Support for Layer 3 VPN. The **vrf-table-label** statement is supported. (Added in Junos OS 15.1F5.)
- Support for destination class usage (DCU) and source class usage (SCU) accounting. (Added in Junos OS 15.1F5.)



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.
-

Default T4000 Routers—By default, the improved VPLS MAC address learning feature is disabled.
PTX Series Routers—By default, the **enhanced-mode** 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

- [Network Services Mode Overview on page 195](#)
- [show chassis fpc on page 1322](#)
- *mac-table-size*
- [show chassis network-services on page 1567](#)

error

Syntax `error {
 (fatal | major | minor) {
 threshold threshold number;
 action (alarm | disable-pfe | offline-pic | 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.

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.

- **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.

**Required Privilege
Level**

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

**Related
Documentation**

- [Traffic Black Hole Caused by Fabric Degradation on page 401](#)
- [Configuring FPC Error Levels and Actions on page 308](#)
- [fpc error on page 574](#)
- [show chassis fabric errors on page 1120](#)
- [show chassis fpc errors on page 1362](#)

esmc-transmit

Syntax	esmc-transmit { interfaces (all | <i>interface-name</i>); }
Hierarchy Level	[edit chassis synchronization]
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	<i>interface-name</i> —Enable ESMC packet transmission on this interface. all—Enable ESMC packet transmission on all interfaces.
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"> • synchronization on page 672

ethernet (Chassis)

Syntax	ethernet { device-count <i>number</i> ; lacp { link-protection { non-revertive; } system-priority ; }
Hierarchy Level	[edit chassis aggregated-devices]
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"> • Configuring Junos OS for Supporting Aggregated Devices on page 335 • Configuring LACP Link Protection of Aggregated Ethernet Interfaces (CLI Procedure)

fabric upgrade-mode

Syntax	<pre>fabric { upgrade-mode; }</pre>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 7.5.
Description	Configure upgrade mode for SIBs and forces them to operate in the same mode until the upgrade is complete.
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">• TX Matrix Router and T640 Router Configuration Overview on page 205


fabric upgrade-mode 3d-fabric

Syntax (TX Matrix Plus Router)	<pre>fabric upgrade-mode 3d-fabric;</pre>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 13.2.
Description	<ul style="list-style-type: none">• Enable the TX Matrix Plus router to upgrade to a TX Matrix Plus router with 3D SIBs. On the SFC, enable setting proper support for mixed SIBs (TXP-F13 SIB and TXP-F13-3D SIB).• Enable the T640 or T1600 or T4000 routers in a routing matrix to support 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).
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">• Configuring Junos OS to Upgrade a T4000 Router to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 250• Configuring Junos OS to Upgrade the T1600 Router Chassis to LCC 0 of a TX Matrix Plus Router with 3D SIBs on page 244• Upgrading an Operational Standalone Router and Integrating It into a TX Matrix Plus Routing Matrix with 3D SIBs

family

Syntax	<pre> family { inet { layer-3; layer-4; symmetric-hash { complement; } } multiservice { source-mac; destination-mac; payload { ip { layer-3; layer-4; } } symmetric-hash { complement; } } } </pre>
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> hash-key]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	(MX Series 3D Universal Edge Routers 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	<p>inet—Configure data used in a hash key for the inet protocol family.</p> <p>multiservice—Configure data used in a hash key for the multiservice protocol family.</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"> Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 269

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 feeds 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 feeds statement at the <code>[edit chassis pem]</code> hierarchy level. When providing four or five input feeds to an LCC router in a routing matrix, you must configure the feeds statement at the <code>[edit chassis lcc lcc-number pem]</code> hierarchy level.</p> <div> NOTE:<ul style="list-style-type: none">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.All power supplies in the router must use the same number of inputs feeds.</div>
Options	Range: 4 through 6 Default: 6
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">Configuring the Six-Input DC Power Supply on page 427

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.



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.

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"> • Example: Configuring Packet Forwarding Engine FIB Localization on page 226

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"> • Example: Configuring Packet Forwarding Engine FIB Localization on page 226

filter

Syntax	filter;
Hierarchy Level	[edit chassis memory-enhanced]
Release Information	Statement added in Junos OS Release 11.1.
Description	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.
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">• Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels on page 414

flexible-queuing-mode

Syntax	<code>flexible-queuing-mode;</code>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 14.1R1 for MPC5E. Statement introduced in Junos OS Release 15.1R1 for MPC2E-3D-NG and MPC3E-3D-NG.
Description	<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>



NOTE: This feature is supported only on non-HQoS variants of MPC2E-3D-NG, MPC3E-3D-NG, and MPC5E.

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"> • Upgrading non-HQoS MPCs to Support Flexible Queuing on page 301 • Flexible Queuing Mode Overview on page 36 • MPC3E on MX Series Routers Overview on page 274 • MPC5E on MX Series Routers Overview on page 279 • Protocols and Applications Supported by the MX240, MX480, MX960, MX2010, and MX2020 MPC5Es • Upgrading non-HQoS MPCs to Support Flexible Queuing on page 301

force-switch

Syntax	force-switch;
Hierarchy Level	[edit chassis synchronization source (external | <i>interface-name</i>)]
Release Information	Statement introduced in Junos OS Release 11.2R4 for MX Series routers.
Description	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.
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">• synchronization (MX Series) on page 672

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 {
            e1 port-number {
                channel-group group-number timeslots slot-number;
            }
        }
        ct3 {
            port port-number {
                t1 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 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 Enable SONET/SDH Framing for SONET/SDH PICs on page 315](#)
 - [Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized \(Multiplexed\) Mode on page 321](#)
 - [Configuring FPC Error Levels and Actions on page 308](#)

fpc (MX Series 3D Universal Edge Routers)

```
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.

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">• Configuring Port-Mirroring Instances on MX Series 3D Universal Edge Routers on page 268• <i>Enabling Inline Service Interfaces</i>• <i>Virtual Chassis Components Overview</i>
------------------------------	--

fpc (TX Matrix and TX Matrix Plus Routers)

Syntax	<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>
Hierarchy Level	[edit chassis <i>lcc number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	On a TX Matrix or TX Matrix Plus router, configure properties for the PICs in individual FPCs.
Options	<p><i>slot-number</i>—Slot number in which the FPC is installed.</p> <p>Range: 0 through 7</p> <p>The remaining statements are explained separately.</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"> • TX Matrix Router and T640 Router Configuration Overview on page 205 • TX Matrix Plus Router Configuration Overview on page 210 • Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 315 • TX Matrix Router Chassis and Interface Names on page 208 • TX Matrix Plus Router Chassis and Interface Names on page 214

fpc error

Syntax `fpc slot number {
 error {
 (fatal | major | minor) {
 threshold threshold-value;
 action (alarm | disable-pfe | offline-pic | 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.

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:



NOTE: You cannot configure the severity level of an error.

- **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.



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.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- [Traffic Black Hole Caused by Fabric Degradation on page 401](#)
- [Configuring FPC Error Levels and Actions on page 308](#)
- [show chassis fabric errors on page 1120](#)
- [show chassis fpc errors on page 1362](#)
- [error on page 559](#)

fpc-feb-connectivity

Syntax	<pre>fpc-feb-connectivity { fpc number feb (slot-number | none); }</pre>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 8.0.
Description	On the M120 router only, configure a connection between any Flexible PIC Concentrator (FPC) and any Forwarding Engine Board (FEB).
Options	<p>fpc number—Specify the FPC slot number. Range: 0 through 5</p> <p>feb slot-number—Specify the FEB slot number. Range: : 0 through 5</p> <p>none—Disconnect the FPC from the FEB.</p>
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">• Configuring the Junos OS to Support FPC to FEB Connectivity on M120 Routers on page 263

fpc-offline-on-blackholing

Syntax	<pre>fpc-offline-on-blackholing;</pre>
Hierarchy Level	[edit chassis fabric degraded]
Release Information	Statement introduced in Junos OS Release 14.2 for TX Matrix Plus routers with 3D SIBs.
Description	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.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• show chassis alarms on page 780


fpc-nmi-volt-fail-knob

Syntax	fpc-nmi-volt-fail-knob (enable | disable)
Hierarchy Level	[edit chassis]
Release Information	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
Description	Enable or disable the non maskable interrupt (NMI) for the voltage failure errors on the flexible pic concentrator (FPC).
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"> • show chassis fpc on page 1322 • Configuring Voltage Level Monitoring of FPCs on page 305

fpc-restart

Syntax	fpc-restart;
Hierarchy Level	[edit chassis fabric degraded]
Release Information	Statement added in Junos OS Release 13.2R6.
Description	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 fpc-restart statement at the edit chassis fabric degraded hierarchy level.
Default	FPCs are not restarted when a traffic black-hole condition is detected.
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"> • Traffic Black Hole Caused by Fabric Degradation on page 401 • Disabling FPC Restart on page 412

fpc-resync

Syntax	fpc-resync;
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	(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.
	<div> NOTE: 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.</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">• Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 333• <i>TX Matrix Router Hardware Guide</i>

framing

Syntax	framing (sdh | sonet);
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	On SONET/SDH PICs only, configure the framing type.
Default	sonet
Options	sdh —SDH framing. sonet —SONET framing.
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">• Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 315

framing (E1 Options)

Syntax	framing (g704 | g704-no-crc4);
Hierarchy Level	[edit chassis synchronization interfaces external e1-options] [edit chassis synchronization interfaces (external-0/0 | external-1/0) e1-options]
Release Information	Statement introduced in Junos OS Release 12.3 for MX Series routers.
Description	Configure the framing format for the E1 interface.
Options	g704 —Set the G.704 framing format for E1 interfaces. g704-no-crc4 —Set the G.704 framing without CRC4 for E1 interfaces.
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"> • synchronization on page 672

framing (T1 Options)

Syntax	framing (esf | sf);
Hierarchy Level	[edit chassis synchronization interfaces external t1-options] [edit chassis synchronization interfaces (external-0/0 | external-1/0) t1-options]
Release Information	Statement introduced in Junos OS Release 12.3 for MX Series routers.
Description	Configure the framing format for the T1 interface.
Options	esf —Set the framing format as extended super frame. sf —Set the framing format as super frame.
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"> • synchronization on page 672

fru-poweron-sequence

Syntax	<code>fru-poweron-sequence fru-poweron-sequence;</code>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 10.0. Statement introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers. Statement introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers. Statement introduced in Junos OS Release 12.3 for T640, T1600, and T4000 routers.
Description	(MX Series 3D Universal Edge Routers only) Configure the power-on sequence for the DPCs in the chassis for routers with the enhanced AC Power Entry Module (PEM). (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.
Options	(MX Series 3D Universal Edge Routers only) fru-poweron-sequence —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**
- [Configuring the Power-On Sequence for DPCs on MX Series Routers with the Enhanced AC PEM on page 291](#)
 - [Configuring the Power-On Sequence for MPCs and FPCs on MX Series, T Series and PTX Series Packet Transport Routers on page 307](#)
 - [Configuring the Power-On Sequence for FPCs on T640, T1600, and T4000 Routers on page 303](#)

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 375](#)
 - [Example: Configuring Precision Time Protocol on page 379](#)
 - [Precision Time Protocol Overview on page 163](#)

global-wait-to-restore

Syntax	<code>global-wait-to-restore <i>minutes</i>;</code>
Hierarchy Level	[edit chassis synchronization]
Release Information	Statement introduced in Junos OS Release 14.2.
Description	<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 wait-to-restore statement at the [edit chassis source interfaces (external-a | external-b | interface <i>interface-name</i>)] hierarchy level.</p>
Options	<p>minutes—Set the time for the port signal to be up before the port is opened to receive and transmit ESMC messages.</p> <p>Range: 0 through 12 minutes</p> <p>Default: 5 minutes</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">• synchronization (MX Series) on page 672• synchronization (PTX Series) on page 680• wait-to-restore on page 697

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 3D Universal Edge Routers 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 269](#)

hold-interval (Clock Synchronization)

Syntax	<pre>hold-interval { configuration-change <i>seconds</i>; restart <i>seconds</i>; switchover <i>seconds</i>; }</pre>
Hierarchy Level	[edit chassis synchronization]
Release Information	Statement introduced in Junos OS Release 11.2R4 for MX Series routers.
Description	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.
Options	<p>configuration-change—Set the wait time for clock selection after a change in configuration. Range: 15 seconds through 60 seconds</p> <p>restart—Set the wait time for clock selection after reboot of the router. Range: 60 seconds through 180 seconds Default: 120 seconds</p> <p>switchover—Set the switchover wait time after clock recovery. Range: 30 seconds through 60 seconds. Default: 30 seconds</p>
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">• synchronization on page 672

holdover-mode-disable

Syntax	<pre>holdover-mode-disable;</pre>
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	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.
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">• synchronization on page 672

hold off time

Syntax	hold-off-time <i>time</i> ;
Hierarchy Level	[set chassis synchronization source interfaces]
Release Information	Statement introduced in Junos OS Release 14.2 for MX Series routers.
Description	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.
Options	<p>time—Amount of time in milliseconds that a signal is held before being passed to the clock selection process.</p> <p>Range: 300–1800 milliseconds</p> <p>Default: 1000 milliseconds</p>
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">• Configuring Clock Synchronization Interface on MX Series Routers on page 353• Ethernet Synchronization Message Channel Overview on page 145

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.

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 385](#)
- [Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 388](#)
- [Understanding Hybrid Mode on page 191](#)
- [Precision Time Protocol Overview on page 163](#)
- [Synchronous Ethernet Overview on page 149](#)

idle-cell-format

Syntax	idle-cell-format { itu-t; payload-pattern <i>payload-pattern-byte</i> ; }
Hierarchy Level	[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)
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For ATM2 PICs only, configure the format of the idle cell header and payload bytes.
Options	<p>itu-t—Configure the idle cell header to use the International Telecommunications Union (ITU-T) standard of 0x00000001.</p> <p>Default: (4 bytes): 0x00000000</p> <p>payload-pattern-byte—Configure the idle cell payload pattern. The payload pattern byte can range from 0x00 through 0xff.</p> <p>Default: cell payload (48 bytes)</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"> • Configuring the Junos OS to Enable Idle Cell Format and Payload Patterns for ATM Devices on page 396

inet (chassis)

Syntax	<pre>inet { layer-3; layer-4; symmetric-hash { complement; } }</pre>
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> hash-key family]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	(MX Series 3D Universal Edge Routers only) Configure data used in a hash key for the inet protocol family when configuring PIC-level symmetrical load balancing on an 802.3ad Link Aggregation Group.
Options	<p>layer-3—Include Layer 3 IP data in the hash key.</p> <p>layer-4—Include Layer 4 IP data in the hash key.</p> <p>symmetric-hash—Configure symmetric hash key with source and destination ports.</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">• Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 269

ingress-policer-overhead

Syntax	<code>ingress-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. Statement introduced in Junos OS Release 15.1X49-D30 for vSRX.
Description	<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

- [set firewall policer](#)


input-current (T4000 Routers)

Syntax	<code>input-current <i>amps-in-each-feed</i>;</code>
Hierarchy Level	[edit chassis pem]
Release Information	Statement introduced in Junos OS Release 12.3.
Description	Configure the amount of input current received in each feed. The value assigned to the input-current statement must be equal to the input current capability of each feed.
<div>  <p>NOTE: Before configuring input current for your router, see the <i>T4000 Core Router Hardware Guide</i> for special considerations.</p> </div>	
Options	<p>Values:</p> <ul style="list-style-type: none"> 40—Indicates 40 A of input current is received in each feed. 60—Indicates 60 A of input current is received in each feed. <p>Default: 60 A</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"> Configuring the Six-Input DC Power Supply on page 427


interfaces external

Syntax	<pre>interfaces { external/external-0-0/external-1/0 { e1-options { framing (g704 | g704-no-crc4); line-encoding (ami | hdb3); sabit <i>bit</i>; } signal-type (1mhz | 5mhz | 10mhz | 2048khz | t1 | e1); t1-options { framing (esf | sf); line-encoding (ami | b8zs); } pulse-per-second-enable; } }</pre>
Hierarchy Level	[edit chassis synchronization]
Release Information	Statement introduced in Junos OS Release 12.3 for MX Series routers.
Description	<p>Starting from Junos OS Release 12.3, configure options for the external clock source interface—external—for SCBE.</p> <p>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.</p>
Options	The 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	<ul style="list-style-type: none">• synchronization on page 672

ipv6-extended-attrib

Syntax	ipv6-extended-attrib;
Hierarchy Level	[edit chassis fpc slot-number inline-services ipv6 flow-table-size]
Description	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>  NOTE: Collection of IPv4 fragmentation IDs occurs automatically without having to configure this setting explicitly. </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"> • Configuring Inline Active flow Monitoring

ir-mode

Syntax	ir-mode (IR | R);
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 14.2.
Description	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>  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 mode. </div>	
Options	<p>IR—Configure the license mode IR for an MPC installed in a specified MPC slot.</p> <p>R—Configure the license mode R for an MPC installed in a specified MPC slot.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • License Modes for Enhanced MPCs Overview on page 24 • Configuring the License Mode for Specific Enhanced MPCs on MX Series Routers on page 289

lacp

Syntax	<pre>lacp { link-protection { non-revertive; } system-priority <i>priority</i>; }</pre>
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	<ul style="list-style-type: none">• Configuring Junos OS for Supporting Aggregated Devices on page 335

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 interface—To view this statement in the configuration.
Level interface-control—To add this statement to the configuration.

**Related
Documentation**

- [TX Matrix Router and T640 Router Configuration Overview on page 205](#)
- [Using the Junos OS to Configure a T640 Router Within a Routing Matrix on page 221](#)
- [TX Matrix Plus Router Configuration Overview on page 210](#)
- [Using the Junos OS to Configure a T1600 or T4000 Router Within a Routing Matrix on page 237](#)
- *TX Matrix Router Hardware Guide*
- *TX Matrix Plus Router Hardware Guide*

lcc-mode

Syntax	<pre>lcc-mode { lcc <i>lcc_number</i>{ mode <i>mode</i>; } }</pre>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 13.1 for TX Matrix Plus routers with 3D SIBs.
Description	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 <i>mode</i> variable as empty , then the line-card chassis goes offline. If the <i>mode</i> statement is not configured, then by default the LCC functions as a T1600 router.
Default	If you do not include the lcc-mode statement, the LCC functions as a T1600 router.
Options	<p>lcc <i>number</i>—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 <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> • 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. <p>mode <i>mode</i>—Configure the LCC to function as a T1600 or a T4000 router. The value of the <i>mode</i> variable can be set as t1600, t4000, or empty.</p>
Required Privilege Level	interface-control
Related Documentation	<ul style="list-style-type: none"> • <i>Overview of a Routing Matrix with a TX Matrix Plus Router</i> • <i>Example: Configuring a Routing Matrix with a TX Matrix Plus Router in Mixed Mode</i>

led-beacon

Syntax	led-beacon
Hierarchy Level	[edit interfaces <i>interface-name (with port number)</i>]
Release Information	Command introduced in Junos OS Release 15.1F3 on the PTX Series.
Description	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)*.

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">• <i>show interfaces detail</i>

license-mode

Syntax	license-mode ip | lsr
Hierarchy Level	[edit chassis fpc <i>slot-number</i>]
Release Information	Statement introduced in Junos OS Release 15.1F3 for PTX Series routers with third-generation FPCs.
Description	Configures the FPC's license mode. This can be used to track the number of PICs configured for a specific mode.
Options	ip —Sets the PIC to full IP mode. lsr —Sets the PIC to LSR mode.
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">• fpc on page 569

line-encoding (E1 Options)

Syntax	line-encoding (ami | hdb3);
Hierarchy Level	[edit chassis synchronization interfaces external e1-options] [edit chassis synchronization interfaces (external-0/0 | external-1/0) e1-options]
Release Information	Statement introduced in Junos OS Release 12.3 for MX Series routers.
Description	Configure the line encoding format on the E1 interface.
Options	ami —Set the line encoding format as automatic mark inversion. hdb3 —Set the line encoding format as high-density bipolar 3 code.
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"> • synchronization on page 672

line-encoding (T1 Options)

Syntax	line-encoding (ami | b8zs);
Hierarchy Level	[edit chassis synchronization interfaces external t1-options] [edit chassis synchronization interfaces (external-0/0 | external-1/0) t1-options]
Release Information	Statement introduced in Junos OS Release 12.3 for MX Series routers.
Description	Configure the line encoding format on the T1 interface.
Options	ami —Set the line encoding format as automatic mark inversion. b8zs —Set the line encoding format as 8-bit zero suppression.
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"> • synchronization on page 672

linerate-mode

Syntax	linerate-mode;
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> linerate-mode], [edit chassis lcc <i>number</i> fpc <i>slot-number</i> pic <i>pic-number</i> linerate-mode] (Routing Matrix)
Release Information	Statement introduced in Junos OS Release 10.1.
Description	For 10-port 10-Gigabit Oversubscribed Ethernet (OSE) PICs only, configure the line rate operation.
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">• <i>Junos OS Network Interfaces Library for Routing Devices</i>

link-protection (Protocols LACP)

Syntax	link-protection { non-revertive; }
Hierarchy Level	[edit chassis aggregated-devices ethernet lacp]
Release Information	Statement introduced in Junos OS Release 9.3.
Description	Enable LACP link protection at the global (chassis) level.
Options	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	<ul style="list-style-type: none">• Configuring Junos OS for Supporting Aggregated Devices on page 335

local-ip-address (master)

Syntax	<code>local-ip-address <i>local-ip-address</i>;</code>
Hierarchy Level	[edit protocols ptp master interface <i>interface-name</i> unicast-mode clock-client <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	<i>local-ip-address</i> —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"> • Configuring Precision Time Protocol on page 375 • Example: Configuring Precision Time Protocol on page 379 • Precision Time Protocol Overview on page 163

local-ip-address (slave)

Syntax	<code>local-ip-address <i>local-ip-address</i>;</code>
Hierarchy Level	[edit protocols ptp slave interface <i>interface-name</i> unicast-mode clock-source <i>ip-address</i>]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	Configure the IP address of the interface acting as the slave.



NOTE: You must configure the same IP address at the [edit interfaces *interface-name*] hierarchy level.

Options	<i>local-ip-address</i> —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"> • Configuring Precision Time Protocol on page 375 • Example: Configuring Precision Time Protocol on page 379 • Precision Time Protocol Overview on page 163

master

Syntax

```
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 {  
    transport 802.3 link-local;  
  }  
}
```

Hierarchy Level [edit protocols ptp]

Release Information Statement introduced in Junos OS Release 12.2.

Description Configure the master with parameters.


The remaining statements are explained separately.

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 375](#)
- [Example: Configuring Precision Time Protocol on page 379](#)
- [Precision Time Protocol Overview on page 163](#)

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	(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 <code>set protocols mpls static-label-switched-path</code> .
	<div>  <p>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 <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>Error: Number of members in Unilist NH exceeds the maximum supported 16 on Trio.</p> </div>
Default	16
Options	<code>next-hops</code> —Specify the number of next hops (16, 32, or 64) for RSVP or LDP LSPs, or MPLS static LSPs
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"> • Configuring ECMP Next Hops for RSVP and LDP LSPs for Load Balancing on page 339

maximum-links

Syntax	<code>maximum-links <i>maximum-links-limit</i>;</code>
Hierarchy Level	[edit chassis aggregated-devices]
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, "Network Services Mode Overview" on page 195.</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>
<div> NOTE: This statement is not supported on the MX80 router and the PTX1000 packet transport router.</div>	
Options	<p><i>maximum-links-limit</i>—Maximum links limit for aggregated devices.</p> <p>Range: 16, 32, 64</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">• Network Services Mode Overview on page 195• Configuring Junos OS for Supporting Aggregated Devices on page 335• Configuring an Aggregated Ethernet Interface• network-services on page 616

max-queues-per-interface

Syntax	max-queues-per-interface (8 | 4);
Hierarchy Level	[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)
Release Information	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.
Description	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.
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"> • Configuring the Junos OS to Support Eight Queues on IQ Interfaces for T Series and M320 Routers on page 265 • <i>Configuring Up to 16 Forwarding Classes</i> • <i>Enabling Eight Queues on ATM Interfaces</i> • <i>Configuring the Maximum Number of Queues for Trio MPC/MIC Interfaces</i>

max-transmit-quality-level

Syntax	max-transmit-quality-level;
Hierarchy Level	[edit chassis synchronization]
Release Information	Statement introduced in Junos OS Release 12.3 for MX Series routers.
Description	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 Table 20 on page 174 .



NOTE: 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.

Options *quality-level*—The available quality levels are as given in [Table 20 on page 174](#).

Table 44: 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	interface—To view this statement in the configuration.
Level	interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• synchronization on page 672

member

Syntax	<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>
Hierarchy Level	[edit virtual-chassis]
Release Information	Statement introduced in Junos OS Release 9.0 for EX Series switches. Statement introduced in Junos OS Release 13.2X50-D15 for the QFX Series. Statement introduced in Junos OS Release 13.2X51-D20 for Virtual Chassis Fabric (VCF).
Description	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.
Default	<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>
Options	<p><i>member-id</i>—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>
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Autoprovisioning a Virtual Chassis Fabric</i>• <i>Preprovisioning a Virtual Chassis Fabric</i>• <i>Adding a Device to a Virtual Chassis Fabric</i>• <i>Configuring a QFX Series Virtual Chassis (CLI Procedure)</i>

- *Example: Configuring an EX4200 Virtual Chassis Using a Preprovisioned Configuration File*
- *Example: Setting Up a Full Mesh EX8200 Virtual Chassis with Two EX8200 Switches and Redundant XRE200 External Routing Engines*
- *Configuring an EX3300 Virtual Chassis (CLI Procedure)*
- *Configuring an EX4200, EX4500, or EX4550 Virtual Chassis (CLI Procedure)*
- *Configuring an EX8200 Virtual Chassis (CLI Procedure)*
- *Configuring an EX9200 Virtual Chassis*
- *Configuring a QFX Series Virtual Chassis (CLI Procedure)*

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. 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	<ul style="list-style-type: none"> • Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels on page 414

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 20 on page 174). 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 45: 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	<ul style="list-style-type: none"> synchronization on page 672

mic-aware-power-management

Syntax	<code>mic-aware-power-management;</code>
Hierarchy Level	<code>[edit chassis]</code>
Release Information	Statement introduced in Junos OS Release 15.1.
Description	<p>Configure the dynamic power management feature, which helps optimize power utilization for MPCs, MICs, and other components. When this feature is disabled, the chassis manager checks for the worst-case power requirement of the MICs before allocating power for the MPCs. Whereas, when dynamic power management is enabled, the worst-case power requirement of MICs is not considered while budgeting power for the MPCs. Dynamic power management is disabled by default.</p> <p>To disable dynamic power management, use the delete chassis mic-aware-power-management configuration mode command. Every time you enable or disable dynamic power management, you must restart the chassis or the MPC for the changes to take effect.</p> <p>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 routers restart.</p>
	<p> NOTE: Dynamic power management is supported only on MPC3E-3D-NG, MPC3E-3D-NG-Q, MPC2E-3D-NG, and MPC2E-3D-NG-Q on MX240, MX480, MX960, MX2010, and MX2020 3D Universal Edge Routers that run Junos OS Release 15.1.</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"> • Configuring Dynamic Power Management to Optimize Power Utilization for MPCs on page 298 • Disabling Dynamic Power Management on page 300 • preserve-fpc-poweron-sequence on page 639 • Understanding Dynamic Power Management on page 34


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	<i>number</i> —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. Range: 1 through 255 Default: 16
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">• Configuring the Junos OS to Support the Link Services PIC on page 324

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]</code> (Routing Matrix)
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	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">• Modes of Operation of 10-Gigabit Ethernet PICs• Configuring Mixed-Rate Mode Operation on page 329

multicast-mode (PTP Master and Slave Interfaces)

Syntax	<pre>multicast-mode { asymmetry <i>number</i>; transport 802.3 link-local; }</pre>
Hierarchy Level	[edit protocols ptp <i>slave</i> interface <i>interface-name</i>], [edit protocols ptp <i>master</i> interface <i>interface-name</i>]
Release Information	Statement introduced in Junos OS Release 15.1 for MX Series routers.
Description	<p>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.</p>
<div style="display: flex; align-items: center;">  <div> <p>NOTE: You can configure only multicast mode or only unicast mode of transmission of PTP traffic on an interface at a point in time.</p> </div> </div>	
<p>The remaining statements are explained separately.</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"> • Configuring Precision Time Protocol on page 375 • Example: Configuring Precision Time Protocol on page 379 • Precision Time Protocol Overview on page 163

multiservice

Syntax	<pre>multiservice { source-mac; destination-mac; payload { ip { layer-3 (source-ip-only | destination-ip-only); layer-4; } } symmetric-hash { complement; } }</pre>
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> hash-key family]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	(MX Series 3D Universal Edge Routers only) Configure data used in a hash key for the multiservice protocol family when configuring PIC-level symmetrical hashing for load balancing on an 802.3ad Link Aggregation Group.
Options	<p>destination-mac—Include destination MAC address in the hash key.</p> <p>payload—Include payload data in the hash key. This option has the following suboptions:</p> <ul style="list-style-type: none">• layer-3—Include Layer 3 IP information in the hash key.• layer-4—Include Layer 4 IP information in the hash key. <p>source-mac—Include source MAC address in the hash key.</p> <p>symmetric-hash—Create a symmetric hash or symmetric hash complement key with any attribute.</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">• Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 269

network-option

Syntax	network-option (option-1 | option-2);
Hierarchy Level	[edit chassis synchronization]
Release Information	Statement introduced in Junos OS Release 11.2R4 for MX Series routers.
Description	Configure the Ethernet equipment clock (EEC) synchronization networking type.



NOTE: For SCB, this option is set with the `set chassis synchronization network-type (option-1 | option-2)` configuration command at the [edit] hierarchy level.




NOTE: 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.

```
user@host# deactivate chassis synchronization
user@host# activate chassis synchronization
```

Options	Depending on the configuration of the Synchronization Status Messages (SSM) quality level, the network option functions in the following ways: <ul style="list-style-type: none"> • option-1—Maps to the G.813 option 1 (EEC1). • option-2—Maps to the G.812 type IV clock (EEC1).
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"> • synchronization on page 672

network-services

Syntax	network-services (ethernet | enhanced-ethernet | ip | enhanced-ip | lan);
Hierarchy Level	[edit chassis]
Release Information	Statement introduced before Junos OS Release 8.5. Options enhanced-ethernet and enhanced-ip options introduced in Junos OS Release 11.4. limited-ifl-scaling option introduced in Junos OS Release 15.1R3 for MX Series routers.
Description	Set the router's network services to a specific mode of operation.
Options	<p>ethernet—Set the router's network services to Ethernet and use standard, compiled firewall filter format.</p> <p>enhanced-ethernet—Set the router's network services to enhanced Ethernet and use enhanced mode capabilities. Only Trio MPCs and MS-DPCs are powered on in the chassis.</p> <p>ip—Set the router's network services to Internet Protocol and use standard, compiled firewall filter format.</p> <p>enhanced-ip—Set the router's network services to enhanced Internet Protocol and use enhanced mode capabilities. Only Trio MPCs and MS-DPCs are powered on in the chassis. Non-service DPCs do not work with enhanced network services mode options.</p> <p>lan—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>
<div>  <p>NOTE: Only Multiservices DPCs (MS-DPCs) are powered on with the enhanced network services mode options. No other DPCs function with the enhanced network services mode options.</p> </div>	
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"> • Network Services Mode Overview on page 195 • <i>Firewall Filters and Enhanced Network Services Mode Overview</i> in the <i>Junos OS Broadband Subscriber Management and Services Library</i> • Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 292 • <i>Configuring Enhanced IP Network Services for a Virtual Chassis</i>

no-concatenate

Syntax	no-concatenate;
Hierarchy Level	[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)
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 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. They work in the transmit direction only on channels 1, 2, and 3.</p>
Default	Output is concatenated (multiplexed).
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"> • Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized (Multiplexed) Mode on page 321

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.

**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].
-

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">• Configuring a Port Speed on page 330

no-route-localize

Syntax	no-route-localize;
Hierarchy Level	[edit policy-options policy-statement <i>policy-name</i> term <i>term-name</i> then]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Enforce installation of routes on all FIB-remote Packet Forwarding Engines.
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">• Example: Configuring Packet Forwarding Engine FIB Localization on page 226

non-revertive (Chassis)

Syntax	non-revertive;
Hierarchy Level	[edit chassis aggregated-devices ethernet lacp link-protection]
Release Information	Statement introduced in Junos OS Release 9.3. Statement introduced in Junos OS Release 11.4 for EX Series switches.
Description	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.
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">• Configuring Junos OS for Supporting Aggregated Devices on page 335• <i>Configuring LACP Link Protection of Aggregated Ethernet Interfaces (CLI Procedure)</i>

number-of-ports

Syntax	<code>number-of-ports <i>number-of-active-physical-ports</i>;</code>
Hierarchy Level	<code>[edit chassis fpc <i>slot-number</i>]</code> <code>[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i>]</code>
Release Information	Statement introduced in Junos OS Release 10.1 for the 16x10GE MPC. Support for MPC3, MPC4, MPC5, and MPC6 introduced in Junos OS Release 13.3R2. Support for MPC7E-MRATE MPC introduced in Junos OS Release 15.1F4. Support for MPC8E and MPC9E introduced in Junos OS Release 15.1F5.
Description	<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 yellow. When you specify 12 active ports, one port per Packet Forwarding Engine is disabled and the corresponding LED appear yellow. 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 <i>Supported Active Physical Ports for Configuring Rate Selectability to Prevent Oversubscription</i>.</p>
Options	<code>number-of-active-physical-ports</code> —Specify the number of physical ports to enable on PICs or MICs on an MPC.
Required Privilege Level	<code>interface</code> —To view this statement in the configuration. <code>interface-control</code> —To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Number of Active Ports on MX Series Routers on page 271• <i>Supported Active Physical Ports for Configuring Rate Selectability to Prevent Oversubscription</i>• <i>Configuring Rate Selectability on MPC7E (Multi-Rate) to Enable Different Port Speeds</i>• <i>Configuring Rate Selectability on MIC-MRATE to Enable Different Port Speeds</i>• <i>Understanding Rate Selectability</i>

offline

Syntax	offline;
Hierarchy Level	[edit chassis <i>lcc number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	(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.
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"> • online-expected on page 624 • TX Matrix Router and T640 Router Configuration Overview on page 205 • TX Matrix Plus Router Configuration Overview on page 210 • Configuring the Junos OS to Enable the TX Matrix Router to Generate an Alarm If a T640 Router Stays Offline on page 223 • Configuring the Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 or T4000 Router Stays Offline on page 238



offline-on-fabric-bandwidth-reduction

Syntax	offline-on-fabric-bandwidth-reduction;
Hierarchy Level	[edit chassis fpc <i>slot-number</i>]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure an FPC with degraded fabric bandwidth offline, to avoid causing a traffic black hole in the chassis for an extended time.
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"> • Disabling an FPC with Degraded Fabric Bandwidth on page 412 • Traffic Black Hole Caused by Fabric Degradation on page 401

on-disk-failure (Chassis Routing Engine)

Syntax	<code>on-disk-failure { disk-failure-action (halt | reboot); }</code>
Hierarchy Level	[edit chassis routing-engine]
Release Information	Statement introduced before JUNOS Release 7.4. The disk-failure-action statement added in JUNOS Release 9.0.
Description	Instruct the router to halt or reboot if it detects hard disk errors on the Routing Engine.
Options	The remaining statement is explained separately.
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">• Configuring the Junos OS to Enable a Routing Engine to Reboot on Hard Disk Errors on page 416

on-error

Syntax	<pre>on-error { raise-alarm; power (cycle | off); write-coredump; }</pre>
Hierarchy Level	<pre>[edit chassis cfeb 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>
Release Information	<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>
Description	Instruct the FPC or FEB or CFEB to perform actions during an error condition.
Options	<p>raise-alarm—Generate and display a chassis alarm in case of an error.</p> <p>power cycle—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>power off—Halt the FPC or FEB or CFEB and keep it offline. This statement is useful in case of permanent hardware failures.</p>
	<div>  <p>CAUTION: The power off 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>NOTE: The power cycle and power off statements are mutually exclusive: You can configure either the power cycle or the power off statement for an error.</p> </div>
	write-coredump —Trigger the core file in case of an error.
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"> • Configuring Sanity Polling on page 418 • sanity-poll on page 656 • retry-count on page 653

online-expected

Syntax	online-expected;
Hierarchy Level	[edit chassis <i>lcc number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	(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.
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">• TX Matrix Router and T640 Router Configuration Overview on page 205• TX Matrix Plus Router Configuration Overview on page 210• Configuring the Junos OS to Enable the TX Matrix Router to Generate an Alarm If a T640 Router Stays Offline on page 223• Configuring the Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 or T4000 Router Stays Offline on page 238• offline on page 621

oss-map

Syntax	oss-map { model-name t640|t1600; }
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>model-name t640—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 show chassis hardware, the show snmp mib walk system, and the show snmp mib walk jnxBoxAnatomy operational commands.</p> <p>model-name t1600—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 show chassis hardware, the show snmp mib walk system, and the show snmp mib walk jnxBoxAnatomy 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"> • Configuring OSS Mapping to Represent a T4000 Chassis as a T1600 or a T640 Chassis on page 304 • Example: Configuring a T4000 Chassis to Represent a T640 Chassis on page 502 • show chassis oss-map on page 1569 • Understanding Operations Support Systems Mapping on page 36

output interfaces external

Syntax

```
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;  
    }  
  }  
}
```

Hierarchy Level [edit chassis [synchronization](#)]

Release Information Statement introduced in Junos OS Release 12.3 for MX Series routers.

Description Configure the options for the external clock output interface—external—on SCBE.

Configure the options for the external clock output interfaces—external-0/0 and external-1/0—on SCBE2.


Options The statements are explained separately.

Required Privilege interface—To view this statement in the configuration.
Level interface-control—To add this statement to the configuration.

Related Documentation

- [synchronization on page 672](#)

packet-scheduling

Syntax	(packet-scheduling | no-packet-scheduling);
Hierarchy Level	[edit chassis]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	(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.
Default	no-packet-scheduling
<div>  NOTE: The packet-scheduling feature is available on M160 routers only. </div>	
Options	<p>no-packet-scheduling—Do not schedule packets.</p> <p>packet-scheduling—Schedule packets to preserve interpacket gaps.</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"> • Configuring the Junos OS to Enable an M160 Router to Operate in Packet Scheduling Mode on page 262

payload

Syntax	<pre>payload { ip { layer-3; layer-4; } }</pre>
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> hash-key family multiservice]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	(MX Series 3D Universal Edge Routers only) Include payload data in a hash key for the multiservice protocol family when configuring PIC-level symmetrical load balancing on an 802.3ad Link Aggregation Group.
Options	<p>ip—Include IPv4 payload data in the hash key. This option has the following suboptions:</p> <ul style="list-style-type: none">• layer-3—Include Layer 3 IP information in the hash key.• layer-4—Include Layer 4 IP information in the hash key.
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">• Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 269

pem (M320 Routers)

Syntax	<pre>pem { minimum <i>number</i>; }</pre>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 7.4.
Description	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.
Options	minimum <i>number</i> —Minimum number of PEMs on the router. Range: 0 through 3
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">• Configuring the Junos OS to Support Entry-Level Configuration on an M320 Router with a Minimum Number of SIBs and PIMs on page 266• sib on page 659

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 feeds introduced in Junos OS Release 12.1. Option input-current 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	feeds <i>number-of-input-feeds</i> —Number of input feeds connected to the six-input DC power supply. (For T4000 routers only) input-current <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">• Configuring the Six-Input DC Power Supply on page 427

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 {
                t1 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.

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 315](#)
- [Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized \(Multiplexed\) Mode on page 321](#)
- [Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 343](#)
- [Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 322](#)

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 {
            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.

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.

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 Enable SONET/SDH Framing for SONET/SDH PICs on page 315](#)
- [Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized \(Multiplexed\) Mode on page 321](#)
- [Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 343](#)
- [Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 322](#)
- [Enabling Inline Service Interfaces](#)

pic (TX Matrix and TX Matrix Plus Routers)

Syntax	<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>
Hierarchy Level	[edit chassis lcc <i>number</i> fpc <i>slot-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	On a TX Matrix or TX Matrix Plus router, configure properties for an individual PIC.
Options	<p><i>pic-number</i>—Slot number in which the PIC is installed.</p> <p>Range: 0 through 3</p> <p>The remaining statements are explained separately.</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">• TX Matrix Router and T640 Router Configuration Overview on page 205• TX Matrix Plus Router Configuration Overview on page 210• Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 315

policer-drop-probability-low

Syntax	policer-drop-probability-low;
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 11.4R1.
Description	<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 policer-drop-probability-low statement causes the policers to operate as strict rate limiters and to ignore the standard TCP behavior.</p> <p>The policer-drop-probability-low statement is applicable to the following routing platforms:</p> <ul style="list-style-type: none"> • M7i • M10i • M120 • M320 • MX Series
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"> • show pfe cfeb on page 1716 • show pfe feb on page 1720 • show pfe fpc on page 1726

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">• Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 343


port auxiliary time-of-day-format

Syntax	<code>port auxiliary time-of-day-format <i>ascii 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">• synchronization (MX Series) on page 672

port-speed

Syntax	<code>port-speed [10G | 40G | 100G];</code>
Hierarchy Level	<code>[edit chassis fpc slot-number pic pic-number port port-number]</code>
Release Information	Statement introduced in Junos OS Release 15.1F3 for the PTX Series.
Description	Configure the port speed on interface modules that support multiple port speeds. To check the port speed, use the show interfaces 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	<p>10G—10 Gbps</p> <p>40G—40 Gbps</p> <p>100G—100 Gbps</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"> • <i>Modes of Operation of 10-Gigabit Ethernet PICs</i> • Configuring Mixed-Rate Mode Operation on page 329 • mixed-rate-mode on page 612

power

Syntax	<code>power (off | on);</code>
Hierarchy Level	<code>[edit chassis fpc slot-number]</code> <code>[edit chassis fpc name pic],</code> <code>[edit chassis lcc name fpc name pic name],</code> <code>[edit chassis member name fpc name pic]</code>
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>
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>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>
<div>  <p>NOTE: <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>	
Default	<code>on</code>
Options	<p><code>off</code>—Take the FPC offline, and configure it to stay offline, as, for example, after a system reboot.</p> <p><code>on</code>—Bring the FPC online, and configure it to come online automatically, as, for example, after a system reboot.</p> <p><code>off</code>—Take the PIC in the specified FPC offline, and configure it to stay offline, as, for example, after a system reboot.</p> <p><code>on</code>—Bring the PIC in the specified FPC online, and configure it to come online automatically, as, for example, after a system reboot.</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"> Configuring the Junos OS to Make a Flexible PIC Concentrator Stay Offline on page 313

preserve-fpc-poweron-sequence

Syntax	<code>preserve-fpc-poweron-sequence;</code>
Hierarchy Level	<code>[edit chassis]</code>
Release Information	Statement introduced in Junos OS Release 15.1
Description	Preserve the sequence in which the FPCs in the chassis are powered on when the router is restarted. During a system reboot, the FPCs are brought online in the sequence specified in the system log file <code>/var/log/ fpc_poweron_seq.log</code> . When an FPC goes offline, the entry for the FPC is removed from the log file. You can use the show chassis power sequence command to view the configured power-on sequence.



NOTE:

- If both `preserve-fpc-poweron-sequence` and [fru-poweron-sequence](#) statements are configured, then the power-on sequence specified in the [fru-poweron-sequence](#) takes precedence.
- If `preserve-fpc-poweron-sequence` is configured and [fru-poweron-sequence](#) not configured, then the FPCs are powered on in the sequence preserved in the system log file `/var/log/ fpc_poweron_seq.log`.
- If neither of these statements is configured, then the FPCs are powered on in the ascending order of slot numbers of the FPCs. FPCs whose slot numbers are not specified in the log file are powered on in the ascending order of slot numbers of the FPCs.

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"> • fru-poweron-sequence on page 580 • show chassis power sequence on page 1606 • Understanding Dynamic Power Management on page 34

priority1

Syntax	<code>priority1 priority1-value;</code>
Hierarchy Level	<code>[edit protocols ptp]</code>
Release Information	Statement introduced in Junos OS Release 12.2. Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers.
Description	<p>Configure the priority as one of the following:</p> <ul style="list-style-type: none">• 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>.• In the master, the priority value is set to represent itself in the announce message to other slaves.• 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. <p>Note that the lower value takes precedence.</p>
Options	<p><i>priority1-value</i>—The priority value of the clock.</p> <p>Range: 0 through 255</p> <p>Default: 128</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">• Configuring Precision Time Protocol on page 375• Precision Time Protocol Overview on page 163• <i>IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers</i>

priority2

Syntax	<code>priority2 <i>priority2-value</i>;</code>
Hierarchy Level	[edit protocols ptp]
Release Information	Statement introduced in Junos OS Release 12.2. Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers.
Description	Configure the priority2 value. This value is used to differentiate and prioritize the master clocks to avoid confusion when the priority1-value is the same for different master clocks in a network. Note that the lower value takes precedence.
Options	priority2-value —The priority value of the clock. Range: 0 through 255 Default: 128
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"> • Configuring Precision Time Protocol on page 375 • Example: Configuring Precision Time Protocol on page 379 • Precision Time Protocol Overview on page 163 • <i>IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers</i>

priority (Clock Synchronization)

Syntax	<code>priority <i>number</i>;</code>
Hierarchy Level	[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>)]
Release Information	Statement introduced in Junos OS Release 11.2R4 for MX Series routers.
Description	<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>
Options	<i>number</i> —Set the priority level of the clock source. Range: 1 through 5
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">• synchronization (MX Series) on page 672

pulse-per-second-enable

Syntax	<code>pulse-per-second-enable;</code>
Hierarchy Level	[edit chassis synchronization interfaces external] [edit chassis synchronization interfaces (external-0/0 | external-1/0)]
Release Information	Statement introduced in Junos OS Release 12.3 for MX Series routers.
Description	Configure the external interface to receive the pulse per second (PPS) signal on the GPS interface of 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">• synchronization on page 672

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	Statement introduced in Junos OS Release 7.4. Support for TX Matrix and TX Matrix Plus hierarchy added in Junos OS Release 9.6.
Description	Configure delay buffers.



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.

Default `small-scale`

Options `large-scale`—(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).

`small-scale`—(Optional) Set the average packet size used to calculate the number of notification queue entries in the IQ PIC to 40 bytes.



NOTE: You cannot configure the `large-scale` and the `small-scale` options on MX Series routers. Include only the `q-pic-large-buffer` statement to enable the large delay buffer size on Enhanced Queuing DPCs on MX Series routers.

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 Larger Delay Buffers for T1, E1, and DS0 Interfaces Configured on Channelized IQ PICs on page 326](#)
- [Configuring Schedulers](#)

quality-level (Clock Synchronization)

Syntax	quality-level (prc | prs | sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc);
Hierarchy Level	[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>)]
Release Information	Statement introduced in Junos OS Release 11.2R4 for MX Series routers.
Description	<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>
Options	<p>prs—Primary reference source—Stratum 1</p> <p>st2—Stratum 2</p> <p>tnc—Transit node clock</p> <p>st3e—Stratum 3E</p> <p>st3—Stratum 3</p> <p>smc—SONET minimum clock</p> <p>st4—Stratum 4</p> <p>prc—Primary reference clock</p> <p>ssu-a—Synchronization supply unit A</p> <p>ssu-b—Synchronization supply unit B</p> <p>sec—SDH equipment clock</p>
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">• synchronization (MX Series) on page 672

quality-level (hybrid)

Syntax	quality-level (prs | st2 | tnc | st3e | st3 | smc | st4) | (prc | ssu-a | ssu-b | sec);
Hierarchy Level	[edit protocols ptp slave clock-class-to-quality-level-mapping]
Release Information	Statement introduced in Junos OS Release 12.2R2.
Description	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.
Options	<p>prs—Primary reference source—Stratum 1</p> <p>st2—Stratum 2</p> <p>tnc—Transit node clock</p> <p>st3e—Stratum 3E</p> <p>st3—Stratum 3</p> <p>smc—SONET minimum clock</p> <p>st4—Stratum 4</p> <p>prc—Primary reference clock</p> <p>ssu-a—Synchronization supply unit A</p> <p>ssu-b—Synchronization supply unit B</p> <p>sec—SDH equipment clock</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"> • Configuring Hybrid Mode and ESMC Quality Level Mapping on page 385 • Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 388 • Understanding Hybrid Mode on page 191 • Precision Time Protocol Overview on page 163 • Synchronous Ethernet Overview on page 149

quality-mode-enable (MX)

Syntax `quality-mode-enable;`

Hierarchy Level `[edit chassis synchronization]`

Release Information Statement introduced in Junos OS Release 11.2R4 for MX Series routers.

Description Enable Synchronous Ethernet ESMC quality mode. The quality level parameter for a Synchronous Ethernet interface is optional when quality mode is enabled and the selection mode is set to the **received-quality** value.

The default quality level for a Synchronous Ethernet interface is based on the value of network option: The **option-1** statement, when set, selects the **sec** quality level; and the **option-2** statement, when set, selects the **st3** quality level.

[Table 46 on page 646](#) shows whether SSM quality level is supported for a given external interface signal type and framing. The default setting is disabled.

Table 46: 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

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 • [synchronization on page 672](#)


quality-mode-enable (PTX)

Syntax	quality-mode-enable;
Hierarchy Level	[edit chassis synchronization (PTX Series)]
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 quality-mode-enable and the selection-mode received-quality statements are included at the [edit chassis synchronization] hierarchy level.</p> <p>The default quality level for a Synchronous Ethernet interface is based on the value of the network option: The option-1 statement, when included, selects the sec quality level; and the option-2 statement, when included, selects the st3 quality level.</p>
Default	By default, this statement is not included.
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"> • synchronization (PTX Series) on page 680 • Synchronizing Internal Stratum 3 Clock to External Clock Sources on PTX Series Routers on page 365 • show chassis synchronization on page 1673

recovered-clock

Syntax	<code>recovered-clock { port <i>port-number</i>; }</code>
Hierarchy Level	<code>[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i>]</code>
Release Information	Statement introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport Routers.
Description	Select the port where the synchronous clock may be recovered.
Options	<i>port-number</i> —Port number where the synchronous clock may be recovered.
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">• Clock Sources for PTX Series Packet Transport Routers on page 363• Synchronizing Internal Stratum 3 Clock to External Clock Sources on PTX Series Routers on page 365• synchronization (PTX Series) on page 680

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>weighted-averaged—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>instant-usage-weight-exponent <i>exponent-value</i>—(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 2^{-1} through 2^{-31}). If you do not specify this option, the default exponent value is 0, which results in a weight value of $2^0 = 1$. With a weight value of 1, the calculation of weighted average buffer occupancy yields the same value as the simple average buffer occupancy.</p>
<div style="display: flex; align-items: center;">  <div> <p>NOTE: You can specify an exponent value greater than 31, and the value displays in the output of show 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 $2^{-31} = 1 / 2^{31} = 0.0000000004656612873077392578125$.</p> </div> </div>	
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"> Managing Transient Traffic Bursts by Configuring Weighted RED Buffer Occupancy Example: Configuring Weighted RED Buffer Occupancy

redundancy-mode

Syntax	<code>redundancy-mode (increased-bandwidth | redundant)</code>
Hierarchy Level	[edit chassis fabric]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	(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.
Options	<p>increased-bandwidth—Enable increased fabric bandwidth mode for the control boards, which causes all the available fabric planes to be used.</p> <p>redundant—Enable redundancy mode for the control boards, which causes all the FPCs to use 4 fabric planes as active planes.</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">• Detection and Corrective Actions of FPCs with Degraded Fabric on MX Series Routers on page 409• Detection and Recovery of Fabric-Related Failures Caused by Traffic Black Holes on MX Series Routers on page 404• Corrective Actions for Fabric Failures on MX Series Routers on page 406• Router Chassis Configuration Statements on page 516• show chassis fabric redundancy-mode on page 1230• Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 413

request chassis power-manager reset ambient-config

Syntax	request chassis power-manager reset ambient-config
Hierarchy Level	edit
Release Information	Statement introduced in Junos OS Release 15.1
Description	Clear the overshooting condition and reset the power of the overshooting FPC according to the configured ambient temperature. The overshooting condition occurs when an FPC consumes more than the allocated power for more than three minutes. When this condition occurs, the power allocation does not automatically reverse even if the FPC power consumption has reduced to its earlier, lower level.
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"> • Managing Power Allocated to PTX5000 FPCs on the Basis of Chassis Ambient Temperature Configuration on page 33 • Monitoring the Power Consumption of PTX5000 FPCs by Configuring the Ambient Temperature on page 309 • chassis ambient-temperature on page 540

request chassis power-manager reset ambient-config

Syntax	request chassis power-manager reset ambient-config
Hierarchy Level	edit
Release Information	Statement introduced in Junos OS Release 15.1
Description	Clear the overshooting condition and reset the power of the overshooting FPC according to the configured ambient temperature. The overshooting condition occurs when an FPC consumes more than the allocated power for more than three minutes. When this condition occurs, the power allocation does not automatically reverse even if the FPC power consumption has reduced to its earlier, lower level.
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"> • Managing Power Allocated to PTX5000 FPCs on the Basis of Chassis Ambient Temperature Configuration on page 33 • Monitoring the Power Consumption of PTX5000 FPCs by Configuring the Ambient Temperature on page 309 • chassis ambient-temperature on page 540

request (Clock Synchronization)

Syntax	request (force-switch lockout);
Hierarchy Level	[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>)]
Release Information	Statement introduced in Junos OS Release 11.2 R4 for MX Series routers.
Description	Specify the clock selection request criterion.
Options	force-switch —Force switching to a clock source, provided the clock source is enabled and not locked out. Only one configured source may be force-switched. lockout —Clock source is not considered by the selection process. Lockout may be configured for any source.
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">• synchronization (MX Series) on page 672

retry-count

Syntax	<code>retry-count <i>number</i>;</code>
Hierarchy Level	<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)
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	Number of times sanity polling periodically checks for an error condition in the FPC.
Options	<i>number</i> —Number of times sanity polling is allowed to check for an error condition. Range: 1 through 30 Default: 10
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"> • Configuring Sanity Polling on page 418 • sanity-poll on page 656 • on-error on page 623

route (chassis)

Syntax	<code>route;</code>
Hierarchy Level	<code>[edit chassis memory-enhanced]</code>
Release Information	Statement added in Junos OS Release 10.4.
Description	Allocate more jtree memory for routing tables over firewall filters.
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"> • Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels on page 414

routing-engine (Chassis)

Syntax	<pre>routing-engine { on-disk-failure { disk-failure-action (halt | reboot); } }</pre>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced before Junos OS Release 7.4. The disk-failure-action statement added in Junos OS Release 9.0.
Description	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.
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">• Configuring the Junos OS to Enable a Routing Engine to Reboot on Hard Disk Errors on page 416

route-localization

Syntax	<pre>route-localization { inet; inet6; }</pre>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure FIB localization for IPv4 and IPv6 routes.
Options	inet —Configure FIB localization for IPv4 routes. inet6 —Configure FIB localization for IPv6 routes.
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">• Example: Configuring Packet Forwarding Engine FIB Localization on page 226


sabit

Syntax	<code>sabit <i>bit</i>;</code>
Hierarchy Level	[edit chassis synchronization interfaces external e1-options] [edit chassis synchronization interfaces (external-0/0 | external-1/0) e1-options]
Release Information	Statement introduced in Junos OS Release 12.3 for MX Series routers.
Description	Configure the SA bit for exchanging the SSM quality on the E1 interface.
Options	<i>bit</i> —SA bit value. Range: 4 through 8.
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"> • synchronization on page 672


sampling-instance

Syntax	<code>sampling-instance <i>instance-name</i>;</code>
Hierarchy Level	[edit chassis fpc <i>slot-number</i>], [edit chassis lcc <i>number</i> fpc <i>slot-number</i>] (Routing Matrix), [edit chassis member <i>member-number</i> fpc slot <i>slot-number</i>]
Release Information	Statement introduced in Junos OS Release 9.6. Support at the [edit chassis member <i>member-number</i> fpc slot <i>slot-number</i>] hierarchy level introduced in Junos OS Release 14.1. Statement introduced in Junos OS Release 14.1R3 for EX Series switches.
Description	Associate a defined sampling instance with a specific FPC, MPC, or DPC for active sampling instances configured at the [edit forwarding-options sampling] hierarchy level. For M120 routers with FEB, this statement must also be configured under [edit chassis feb <i>slot-number</i>], in addition to the [edit forwarding-options sampling] 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.
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"> • Associating Sampling Instances for Active Flow Monitoring with a Specific FPC, MPC, or DPC on page 417 • Inline Flow Monitoring for Virtual Chassis Overview

sanity-poll

Syntax	<pre>sanity-poll { retry-count <i>number</i>; on-error { raise-alarm; power (cycle | off); write-coredump; } }</pre>
Hierarchy Level	<pre>[edit chassis cfeb <i>slot-number</i>] [edit chassis feb <i>slot-number</i>] [edit chassis fpc <i>slot-number</i>] [edit chassis lcc <i>number</i> fpc <i>number</i>] (Routing Matrix)</pre>
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.
<div> NOTE: Currently, periodic sanity check is performed only on the routing chip register.</div>	
Options	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	<ul style="list-style-type: none">• Configuring Sanity Polling on page 418• retry-count on page 653• on-error on page 623

selection-mode

Syntax	selection-mode (configured-quality | received-quality);
Hierarchy Level	[edit chassis synchronization]
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>configured-quality—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>received-quality—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>  <p>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.</p> </div>	
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"> • synchronization on page 672

service-package

Syntax	service-package (layer-2 | layer-3);
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> adaptive-services]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced on MX Series 3D Universal Edge Routers with MS-DPCs in Junos OS Release 9.6.
Description	For adaptive services interfaces, enable a service package on the specified Physical Interface Card (PIC).
Default	layer-3
Options	layer-2 —Enable a Layer 2 service package on the specified PIC. layer-3 —Enable a Layer 3 service package on the specified PIC.
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">• Configuring the Junos OS to Enable Service Packages on Adaptive Services Interfaces on page 349• Configuring the Junos OS to Support Layer 2 Services on MX Series 3D Universal Edge Routers with MS-DPCs on page 291• Junos Services Interfaces Configuration Guide

session-offload

Syntax	session-offload;
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>number</i> adaptive-services service-package extension-provider]
Release Information	Statement introduced on MX Series 3D Universal Edge Routers with MS-DPCs in Junos OS Release 9.6.
Description	Enable session offloading on a per-PIC basis for a Multiservices PIC.
Default	Session offloading 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">• Configuring the Junos OS to Enable Session Offloading on MX Series 3D Universal Edge Routers with MS-DPCs on page 292

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 request chassis sfm CLI command to take an SFM offline, the SFM will attempt to restart when you enter a commit 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>slot-number—Slot number in which the SFM is installed.</p> <p>power off—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"> • Configuring the Junos OS to Make an SFM Stay Offline on page 262 • <i>High Availability Feature Guide for Routing Devices</i>

sib

Syntax	<pre>sib { minimum <i>number</i>; }</pre>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 7.4.
Description	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.
Options	<p>number—Minimum number of SIBs on the router.</p> <p>Range: 0 through 3</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"> • Configuring the Junos OS to Support Entry-Level Configuration on an M320 Router with a Minimum Number of SIBs and PIMs on page 266 • pem on page 629

signal-type

Syntax	signal-type (1hz | 5mhz | 10mhz | 2048mhz | e1 | t1);
Hierarchy Level	[edit chassis synchronization interfaces external] [edit chassis synchronization interfaces (external-0/0 | external-1/0)]
Release Information	Statement introduced in Junos OS Release 12.3 for MX Series routers.
Description	Configure the frequency for the provided reference clock.
Options	<p>1mhz—Set the signal with a clock frequency of 1 MHz.</p> <p>5mhz—Set the signal with a clock frequency of 5 MHz.</p> <p>10mhz—Set the signal with a clock frequency of 10 MHz.</p> <p>2048khz—Set the signal with a clock frequency of 2048 kHz.</p> <p>e1—Set the signal as an E1-coded 2048-kHz signal on a 120-ohm balanced line.</p> <p>t1—Set the signal as a T1-coded 1.544-MHz signal on a 100-ohm balanced line.</p>
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">• synchronization on page 672

switchover-mode

Syntax	switchover-mode (non-revertive | revertive);
Hierarchy Level	[edit chassis synchronization]
Release Information	Statement introduced in Junos OS Release 11.2R4 for MX Series routers.
Description	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.
Default	revertive
Options	<p>non-revertive—Set this option so that the router continues to use the current clock source as long as it is valid.</p> <p>revertive—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>
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"> • synchronization (MX Series) on page 672 • synchronization (PTX Series) on page 680

slow-pfe-alarm

Syntax	slow-pfe-alarm;
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 12.1R6, 12.2R5, 12.3R3, 13.1R2, and 13.2R1.
Description	Enable the slow Packet Forwarding Engine alarm on a M Series, MX Series, or a T Series router.
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"> • Configuring Slow Packet Forwarding Engine Alarm on page 421

sonet

Syntax	<pre>sonet { device-count <i>number</i>; }</pre>
Hierarchy Level	[edit chassis aggregated-devices]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure properties for SONET/SDH aggregated devices on the router.
Options	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	<ul style="list-style-type: none">• Configuring Junos OS for Supporting Aggregated Devices on page 335

slave

Syntax

```
slave {
  announce-interval announce-interval-value
  announce-timeout announce-timeout-value;
  delay-request delay-request-value;
  frequency-only;
  interface interface-name {
    unicast-mode {
      transport ipv4;
      clock-source ip-address {
        local-ip-address local-ip-address {
        }
      }
    }
    multicast-mode {
      transport 802.3 link-local;
    }
  }
  sync-interval interval;
}
```

Hierarchy Level [edit protocols ptp]

Release Information Statement introduced in Junos OS Release 12.2.

Description Configure the slave with parameters.

The remaining statements are explained separately.

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 375](#)
- [Example: Configuring Precision Time Protocol on page 379](#)
- [Precision Time Protocol Overview on page 163](#)

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	<ul style="list-style-type: none">• synchronization on page 672

source interfaces

Syntax	<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>
Hierarchy Level	[edit chassis synchronization]
Release Information	Statement introduced in Junos OS Release 11.2R4 for MX Series routers.
Description	<p>Configure the clock source that is used by the clock selection process on an interface.</p> <ul style="list-style-type: none"> • (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. • (SCBE only) Specify the external interface to select the external clock source. • (SCBE2 only) Specify the external-0/0 interface or the external-1/0 interface to select the external clock source.
Options	The statements are explained separately.
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"> • synchronization (MX Series) on page 672

sparse-dlcis

Syntax	sparse-dlcis;
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i>];
Release Information	Statement introduced before Junos OS Release 7.4.
Description	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.
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"> • Configuring the Junos OS to Support the Sparse DLCI Mode on Channelized STM1 or Channelized DS3 PICs on page 320

speed

Syntax	<code>speed (oc3-stm1 | oc12-stm4 | oc48-stm16 | 100G | 10G | 40G);</code>
Hierarchy Level	<code>[edit chassis fpc slot-number pic pic-number port port-number]</code>
Release Information	Statement introduced in Junos OS Release 11.2. Support for MPC7E (Multi-Rate) introduced in Junos OS Release 15.1F4. Statement introduced in Junos OS Release 15.1F5 for MX Series routers with the MIC-MRATE MIC.
Description	Configure the port speed on MX Series routers. This statement is supported only on MPC7E (Multi-Rate) MPC, MIC-MRATE MICs, SONET/SDH (Multi-Rate) MICs with SFP, Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP, and ATM MICs.
Default	<code>oc3-stm1</code>
Options	<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.

(MX2010 and MX2020 routers with MIC-MRATE on MPC8E and MPC9E) To configure the port speed at the port level on the MIC-MRATE MIC, specify **100G**, **10G**, or **40G**, respectively, as the speed for specific ports on the MIC-MRATE MIC on MPC8E and MPC9E. All the twelve ports of MIC-MRATE MIC support 10 Gbps and 40 Gbps speeds. However, you can configure only 4 ports out of the 12 MIC-MRATE ports on MPC8E with 100 Gbps port speed. Also, you can configure only 8 ports of the 12 MIC-MRATE ports on MPC9E with 100 Gbps port speed.

Required Privilege Level interface—To view this statement in the configuration.
 interface-control—To add this statement to the configuration.

Related Documentation

- [Configuring a Port Speed on page 330](#)
- *Configuring Rate Selectability on MPC7E (Multi-Rate) to Enable Different Port Speeds*
- *Configuring Rate Selectability on MIC-MRATE to Enable Different Port Speeds*
- *Understanding Rate Selectability*

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: <ul style="list-style-type: none"> 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	1G—1 Gbps 10G—10 Gbps
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"> <i>Modes of Operation of 10-Gigabit Ethernet PICs</i> Configuring Mixed-Rate Mode Operation on page 329 mixed-rate-mode on page 612

symmetric-hash

Syntax	<code>symmetric-hash { complement; }</code>
Hierarchy Level	[edit chassis fpc slot-number pic slot-number hash-key family inet], [edit chassis fpc slot-number pic slot-number hash-key family multiservice]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	(MX Series 3D Universal Edge Routers 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.
Options	complement —Include the complement of the symmetric hash in the hash key.
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"> • Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 269

sync-interval

Syntax	<code>sync-interval <i>sync-interval-value</i>;</code>
Hierarchy Level	[edit protocols ptp master]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	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.
Options	<p><i>sync-interval-value</i>—The sync interval value for sync interval messages to be sent by the master.</p> <p>Range: –6 through +6</p> <p>Default: 0</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"> • Configuring Precision Time Protocol on page 375 • Example: Configuring Precision Time Protocol on page 379 • Precision Time Protocol Overview on page 163

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> <p>Statement introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport 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>primary—First external timing source specified in the configuration hierarchy. This statement has the following suboptions:</p> <ul style="list-style-type: none">• external-a—Use external-a as the primary clock synchronization source.• external-b—Use external-b as the primary clock synchronization source.• fpc-slot-number—Use fpc-slot-number as the primary clock synchronization source. For the PTX5000 Packet Transport Router, replace <i>slot-number</i> with a value from 0 through 7.• gps-0-10mhz—Use gps-0-10mhz as the primary clock synchronization source.• gps-0-5mhz—Use gps-0-5mhz as the primary clock synchronization source.• gps-1-10mhz—Use gps-1-10mhz as the primary clock synchronization source.• gps-1-5mhz—Use gps-1-5mhz as the primary clock synchronization source.• bits-a—Use bits-a as the primary clock synchronization source.• bits-b—Use bits-b as the primary clock synchronization source. <p>secondary—Second external timing source specified in the configuration hierarchy.</p> <ul style="list-style-type: none">• 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 the Junos OS to Support an External Clock Synchronization Interface for M Series and T Series Routers on page 351](#)

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);
            }
        }
    }
    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 | (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. Options interfaces , output , and source interfaces external introduced in Junos OS Release 12.3.
Description	<p>(MX5-T, MX10-T, MX40-T, MX80-T, MX240, MX480, and MX960 routers) Configure Synchronous Ethernet parameters. For configuration details, see “Configuring Clock Synchronization Interface on MX Series Routers” on page 353.</p> <p>(MX240, MX480, MX960, and MX2020 routers with SCBE or SCBE2) Configure centralized clocking parameters.</p> <ul style="list-style-type: none"> 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. <p>For configuration details, see “Example: Configuring Centralized Clocking on the Enhanced MX Switch Control Board” on page 484.</p>



NOTE: Unified ISSU is not supported when clock synchronization is configured for Synchronous Ethernet.

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. The default is ???
- **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 20 on page 174](#)). If the quality level of the output clock source drops below the configured minimum quality level threshold, the external output clock is squelched.

Table 47: 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).

- **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 46 on page 646](#) shows whether SSM quality level is supported for a given external interface signal type and framing. The default setting is disabled.

Table 48: 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 20 on page 174](#).



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 | <ul style="list-style-type: none">• Synchronous Ethernet Overview on page 149• show chassis synchronization (MX Series Routers) on page 1678• Configuring Clock Synchronization Interface on MX Series Routers on page 353• Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 372• Example: Configuring Centralized Clocking on the Enhanced MX Switch Control Board on page 484• Example: Configuring Centralized Clocking on an MX2020 on page 493• request chassis synchronization mode on page 766• Clock Sources for PTX Series Packet Transport Routers on page 363 |
|------------------------------|---|

synchronization (PTX Series)

Syntax	<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>
Hierarchy Level	[edit chassis]
Release Information	Statement introduced in Junos OS Release 14.2.
Description	Configure Synchronous Ethernet parameters.
Options	The 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	<ul style="list-style-type: none"> • Synchronous Ethernet Overview on page 149 • Synchronizing Internal Stratum 3 Clock to External Clock Sources on PTX Series Routers on page 365 • request chassis synchronization switch on page 768 • Clock Sources for PTX Series Packet Transport Routers on page 363 • Understanding Clock Synchronization on page 167

synchronous-ethernet-mapping

Syntax	<pre>synchronous-ethernet-mapping { clock-source ip-address { interface <i>interface1-name</i>; interface <i>interface2-name</i>; } }</pre>
Hierarchy Level	[edit protocols ptp slave hybrid]
Release Information	Statement introduced in Junos OS Release 12.2R2.
Description	<p>Configure the Synchronous Ethernet mapping for hybrid mode.</p> <p>The remaining statements are explained separately.</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"> • Configuring Hybrid Mode and ESMC Quality Level Mapping on page 385 • Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 388 • Understanding Hybrid Mode on page 191 • Precision Time Protocol Overview on page 163 • Synchronous Ethernet Overview on page 149

system-priority

Syntax	<code>system-priority <i>priority</i>;</code>
Hierarchy Level	[edit chassis aggregated-devices ethernet lacp]
Release Information	Statement introduced in Junos OS Release 9.3. Statement introduced in Junos OS Release 11.4 for EX Series switches.
Description	<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>
Options	<p><i>priority</i>—Priority for the aggregated Ethernet system. A smaller value indicates a higher priority.</p> <p>Range: 0 through 65535</p> <p>Default: 127</p>
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">• Configuring Junos OS for Supporting Aggregated Devices on page 335• Configuring LACP Link Protection of Aggregated Ethernet Interfaces (CLI Procedure)

t1

Syntax	<code>t1 <i>link-number</i> { <code>channel-group</code> <i>channel-number</i> timeslots <i>slot-number</i>; }</code>
Hierarchy Level	<code>[edit chassis fpc <i>slot-number</i> pic <i>pic-number</i> ct3 port <i>port-number</i>];</code>
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure channelized T1 port and channel specifications.
Options	<p><i>link-number</i>—T1 link.</p> <p>Range: 0 through 27 for DS0 naming</p> <p>The remaining statements are explained separately.</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"> • Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 343

t1-options

Syntax	<code>t1-options { framing (esf | sf); line-encoding (ami | b8zs); }</code>
Hierarchy Level	<p><code>[edit chassis <code>synchronization</code> interfaces external]</code></p> <p><code>[edit chassis <code>synchronization</code> interfaces (external-0/0 | external-1/0) e1-options]</code></p>
Release Information	Statement introduced in Junos OS Release 12.3 for MX Series routers.
Description	Configure the T1 interface options.
Options	The statements are explained separately.
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"> • synchronization on page 672

traffic-manager

List of Syntax	Syntax (MX Series) Configure Queue Monitoring on page 684 Syntax (MX Series, T Series) on page 684 Syntax (M Series) on page 684
Syntax (MX Series) Configure Queue Monitoring	<pre> traffic-manager { queue-threshold { fabric-queue { priority <i>high/low</i>{ threshold <i>threshold-percentage</i>; } } wan-queue { priority <i>high/medium-high/medium-low/low</i> { threshold <i>threshold-percentage</i>; } } } } </pre>
Syntax (MX Series, T Series)	<pre> traffic-manager { egress-shaping-overhead <i>number</i>; ingress-shaping-overhead <i>number</i>; mode { egress-only; ingress-and-egress; } } </pre>
Syntax (M Series)	<pre> traffic-manager { egress-shaping-overhead <i>number</i>; ingress-shaping-overhead <i>number</i>; mode { egress-only; ingress-and-egress; session-shaping; } } </pre>
Hierarchy Level	<pre> [edit chassis fpc <i>slot-number</i>], [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) </pre>
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.



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.

Required Privilege Level interface—To view this statement in the configuration.
 interface-control—To add this statement to the configuration.

Related Documentation

- *Configuring CoS for L2TP Tunnels on ATM Interfaces*
- *egress-shaping-overhead*
- *ingress-shaping-overhead*
- *mode (Layer 2 Tunneling Protocol Shaping)*

transport 802.3 (PTP Multicast Master and Slave)

Syntax	transport 802.3 link-local;
Hierarchy Level	[edit protocols ptp slave interface <i>interface-name</i> multicast-mode], [edit protocols ptp master interface <i>interface-name</i> multicast-mode]
Release Information	Statement introduced in Junos OS Release 15.1 for MX Series routers.
Description	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	<p>802.3—Enable encapsulation for PTP packet transport in multicast mode.</p> <p>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.</p> <p>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.</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"> • Configuring Precision Time Protocol on page 375 • Example: Configuring Precision Time Protocol on page 379 • Precision Time Protocol Overview on page 163

transport (slave)

Syntax	transport ipv4;
Hierarchy Level	[edit protocols ptp slave interface <i>interface-name</i> unicast-mode]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	<p>Configure the encapsulation type for Precision Time Protocol (PTP) packet transport . Currently, IPv4 is the only supported encapsulation type for PTP.</p> <p>The remaining statements are explained separately.</p>
Options	IPv4 —The encapsulation type for Precision Time Protocol packet transport as IPv4.
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">• Configuring Precision Time Protocol on page 375• Example: Configuring Precision Time Protocol on page 379• Precision Time Protocol Overview on page 163


transport (master)

Syntax	transport ipv4;
Hierarchy Level	[edit protocols ptp master interface <i>interface-name</i> unicast-mode]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	<p>Configure the encapsulation type for Precision Time Protocol packet transport. Currently, IPv4 is the only supported encapsulation type for PTP.</p> <p>The remaining statements are explained separately.</p>
Options	IPv4 —The encapsulation type for Precision Time Protocol packet transport as IPv4.
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">• Configuring Precision Time Protocol on page 375• Example: Configuring Precision Time Protocol on page 379• Precision Time Protocol Overview on page 163

transport-type

Syntax	<code>transport-type type;</code>
Hierarchy Level	<code>[edit services hosted-services server-profile <i>server-profile-name</i>]</code>
Release Information	Statement introduced in Junos OS Release 13.2.
Description	Configure the transport type.
Options	<code>type</code> —Transport type. Range: GRE, TCP, or UDP
Required Privilege Level	<code>interface</code> —To view this statement in the configuration. <code>interface-control</code> —To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring Active Flow Monitoring on PTX Series Packet Transport Routers</i>


tunnel-services

Syntax	<pre>tunnel-services { bandwidth (1g | 10g | 20g | 40g); tunnel-only; }</pre>
Hierarchy Level	[edit chassis fpc <i>slot-number</i> pic <i>number</i>]
Release Information	Statement introduced in Junos OS Release 8.2.
Description	<p>For MX Series 3D Universal Edge Routers, configure the amount of bandwidth for tunnel services.</p> <p>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. Use the tunnel-services statement to specify that the IQ2 or IQ2E PIC will work both as a regular PIC and as a tunnel PIC. 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.</p>
	<div>  <p>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.</p> </div>
Options	<p>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.</p> <p>The remaining statements are explained separately.</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"> • Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC on page 475 • Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 476 • Example: Configuring Tunnel Interfaces on the MPC3E on page 476 • bandwidth (Tunnel Services) on page 533 • [edit chassis] Hierarchy Level

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	<ul style="list-style-type: none"> • synchronization on page 672

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 ucode-imem-remap statement at the [edit chassis feb slot <i>number</i>] hierarchy level. The default microcode map will continue to be available if the ucode-imem-remap statement is not configured.</p>
<div style="display: flex; align-items: center;">  <div> <p>NOTE: On M120 routers, the FEB is automatically restarted once the ucode-imem-remap statement is configured and committed.</p> </div> </div>	
Required Privilege Level	interfaces—To view this statement in the configuration. interfaces-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Router Chassis Configuration Statements on page 516


unicast-mode (master)

Syntax	<pre>unicast-mode { transport ipv4; clock-client ip-address { local-ip-address local-ip-address; } }</pre>
Hierarchy Level	[edit protocols ptp master 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.</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">• Configuring Precision Time Protocol on page 375• Example: Configuring Precision Time Protocol on page 379• Precision Time Protocol Overview on page 163

unicast-mode (slave)

Syntax	<pre>unicast-mode { clock-source ip-address { local-ip-address local-ip-address; asymmetry number; } } transport ipv4;</pre>
Hierarchy Level	[edit protocols ptp slave interface <i>interface-name</i>]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	<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.</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"> • Configuring Precision Time Protocol on page 375 • Example: Configuring Precision Time Protocol on page 379 • Precision Time Protocol Overview on page 163 • <i>IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers</i>

unicast-negotiation

Syntax	unicast-negotiation;
Hierarchy Level	[edit protocols ptp]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	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.
<hr/>	
<div> NOTE: When unicast negotiation is enabled, you cannot commit any packet rate–related configuration.</div> <hr/>	
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">• Configuring Precision Time Protocol on page 375• Example: Configuring Precision Time Protocol on page 379• Precision Time Protocol Overview on page 163• IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers

vpn-label

Syntax	vpn-label;
Hierarchy Level	[edit chassis memory-enhanced]
Release Information	Statement added in Junos OS Release 10.4.
Description	Allocate more jtree memory for Layer 3 VPN labels.
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">• Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels on page 414


vrf-mtu-check

Syntax	vrf-mtu-check;
Hierarchy Level	[edit chassis]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 11.1 for EX Series switches.
Description	On M Series routers (except the M120 and M320 router), T Series routers, 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.
Default	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">• <i>Configuring Path MTU Checks for VPN Routing Instances</i>• Configuring the Junos OS to Enable MTU Path Check for a Routing Instance on M Series Routers on page 260

vtmapping

Syntax	vtmapping (itu-t | klm);
Hierarchy Level	[edit interfaces <i>interface-name</i> sonet-options]; [edit chassis <i>fpc number</i> <i>pic number</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<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 [edit chassis <i>fpc number</i> <i>pic number</i>] hierarchy level.</p>
Options	<p>itu-t—International Telephony Union standard.</p> <p>klm—KLM standard.</p> <p>Default: klm</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">• <i>Configuring Virtual Tributary Mapping of Channelized STM1 Interfaces</i>• Configuring the Junos OS to Support Channelized STM1 Interface Virtual Tributary Mapping on page 345

wait-to-restore

Syntax	<code>wait-to-restore <i>minutes</i>;</code>
Hierarchy Level	<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>
Release Information	Statement introduced in Junos OS Release 14.2 for MX Series routers.
Description	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.
<div>  <p>NOTE: When you perform GRES on MX Series routers, you must execute the <code>clear synchronous-ethernet wait-to-restore operational mode</code> 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 operational mode</code> command clears the wait-to-restore timer only on the local Routing Engine.</p> </div>	
Options	<p><i>minutes</i>—Set the time for the port signal to be up before the port is opened to receive and transmit ESMC messages.</p> <p>Range: 0 through 12 minutes</p> <p>Default: 5 minutes</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"> • synchronization (MX Series) on page 672

wander-filter-disable

Syntax	wander-filter-disable;
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	Disable the wander filter on the output interface.
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">• synchronization on page 672

PART 3

Administration

- [Administrative Commands on page 701](#)
- [Monitoring Commands on page 773](#)

CHAPTER 27

Administrative Commands

- clear chassis alarms fabric degraded
- clear chassis display message
- clear synchronous-ethernet esmc statistics
- clear synchronous-ethernet wait-to-restore
- request chassis afeb
- request chassis cb
- request chassis ccg
- request chassis cfeb
- request chassis cip
- request chassis clock master switch
- request chassis fabric guided-cabling disable
- request chassis fabric guided-cabling enable
- request chassis fabric plane
- request chassis feb
- request chassis fpc
- request chassis fpm resync
- request chassis lcc
- request chassis mcs
- request chassis mic
- request chassis optics
- request chassis pcg
- request chassis pic
- 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

Syntax (TX Matrix Plus Router with 3D SIBs)	clear chassis alarms fabric degraded lcc <i>number</i> fpc <i>number</i>
Release Information	Command introduced in Junos OS Release 13.2 for a routing matrix with a TX Matrix Plus routers and 3D SIBs.
Description	Clear the fabric degraded alarm for an FPC.
Options	<p>lcc <i>number</i>—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"> • 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. <p>fpc <i>number</i>—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 lcc <i>number</i> option and replace fpc <i>number</i> with a value from 0 through 7.</p>
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none"> • <i>show system alarms</i>

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

List of Syntax	Syntax on page 705 Syntax (TX Matrix Router) on page 705 Syntax (TX Matrix Plus Router) on page 705 Syntax (QFabric Systems) on page 705
Syntax	clear chassis display message
Syntax (TX Matrix Router)	clear chassis display message <lcc <i>number</i> | scc>
Syntax (TX Matrix Plus Router)	clear chassis display message <lcc <i>number</i> | sfc <i>number</i> >
Syntax (QFabric Systems)	clear chassis display message <node-device <i>name</i> | interconnect-device <i>name</i> >
Release Information	<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>sfc 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>
Description	<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>
Options	<p>none—Clear or stop a text message on the craft interface display.</p> <p>interconnect-device <i>name</i>—(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>lcc <i>number</i>—(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"> 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 770](#)
- [show chassis craft-interface on page 799](#)

List of Sample Output [clear chassis display message on page 706](#)

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 synchronous-ethernet esmc statistics

Syntax	clear synchronous-ethernet esmc statistics < <i>interface-name</i> >
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">• Example: Configuring Synchronous Ethernet on MX Series Routers on page 368• Synchronous Ethernet Overview on page 149• show synchronous-ethernet esmc statistics on page 1759
List of Sample Output	clear synchronous-ethernet esmc statistics on page 708


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 <i>interface-name</i> >
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.
<div>  <p>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.</p> </div>	
Options	interface <i>interface-name</i> —(Optional) Clear wait to restore timer for the specified interface.
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none"> • Example: Configuring Synchronous Ethernet on MX Series Routers on page 368 • Synchronous Ethernet Overview on page 149
List of Sample Output	clear synchronous-ethernet wait-to-restore interface <interface-name> on page 709

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

Syntax	request chassis afeb (offline | online | restart)
Release Information	Command introduced in Junos OS Release 13.2.
Description	Control the operation of the compact Forwarding Engine Board (FEB).
Options	offline —Take the FEB offline. online —Bring the FEB online. restart —Restart the FEB.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• show chassis afeb on page 778
List of Sample Output	request chassis afeb online (MX104 Router) on page 710
Output Fields	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

List of Syntax	Syntax on page 711 Syntax (TX Matrix Router) on page 711 Syntax (TX Matrix Plus Router) on page 711 Syntax (QFabric System) on page 711
Syntax	<code>request chassis cb (offline | online) slot <i>slot-number</i></code>
Syntax (TX Matrix Router)	<code>request chassis cb (offline | online) <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>></code>
Syntax (TX Matrix Plus Router)	<code>request chassis cb (offline | online) <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>></code>
Syntax (QFabric System)	<code>request chassis cb (offline | online) interconnect-device <i>name</i> slot <i>slot-number</i></code> <code><interconnect-device <i>name</i> slot <i>slot-number</i> (offline | online)></code>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS 9.4 for EX Series switches. sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6. Command introduced in Junos OS 11.3 for QFX Series. Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Description	(M120, M320, and MX Series routers and T Series routers, QFabric systems, and EX8200 switches only) Control the operation of the Control Board (CB). For information about the meaning of “CBs” on the switches, see <i>EX Series Switches Hardware and CLI Terminology Mapping</i> .
Options	offline —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 and MX2010 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 890](#)
- *Understanding Switching Control Board Redundancy*

List of Sample Output

[request chassis cb on page 713](#)
[request chassis cb interconnect-device \(QFabric System\) on page 713](#)
[request chassis cb \(MX2020 Router\) on page 713](#)
[request chassis cb \(MX2010 Router\) on page 713](#)

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 ccg

Syntax	<code>request chassis ccg (offline | online) slot <i>slot-number</i></code>
Release Information	Command introduced in Junos OS 12.1x48 for the PTX5000 Packet Transport Routers.
Description	(PTX5000 Packet Transport Routers) Control the operation of the Centralized Clock Generator (CCG).
Options	<p>offline—Take the CCG offline.</p> <p>online—Bring the CCG online.</p> <p>slot <i>slot-number</i>—CCG slot number. Replace <i>slot-number</i> with a value from 0 through 1.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• Clock Sources for PTX Series Packet Transport Routers on page 363• show chassis environment ccg on page 908
List of Sample Output	request chassis ccg on page 714
Output Fields	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 cfeb

Syntax	request chassis cfeb (offline | online | restart)
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M7i and M10i routers only) Control the operation of the Compact Forwarding Engine Board (CFEB).
Options	<p>offline—Take the CFEB offline.</p> <p>online—Bring the CFEB online.</p> <p>restart—Restart the CFEB.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • show chassis cfeb on page 795 • <i>Configuring CFEB Redundancy on the M10i Router</i> • <i>CFEB Overview</i>
List of Sample Output	request chassis cfeb on page 715
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

request chassis cfeb

```
user@host> request chassis cfeb 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	<p>offline—Take the CIP offline.</p> <p>online—Bring the CIP online.</p> <p>slot <i>slot-number</i>—CIP slot number. Replace <i>slot-number</i> with a value ranging from 0 through 1.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• show chassis cip on page 797• <i>Installing a T1600 CIP</i>• <i>Installing a T640 CIP</i>• <i>Installing a TX-CIP</i>• <i>Installing an M320 CIP</i>• <i>Installing the M40e CIP</i>• <i>Installing the T320 CIP</i>• <i>CIP Overview</i>
List of Sample Output	request chassis cip offline slot (TX Matrix Plus Router) on page 716 request chassis cip offline slot (TX Matrix Plus Router) on page 716
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

Syntax	request chassis clock master switch
Release Information	Command introduced in Junos OS Release 12.1.
Description	(PTX Series Packet Transport Routers only) Control which Centralized Clock Generator (CCG) is the master.
Options	This command has no options.
Additional Information	<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 ccg statement at the [edit chassis redundancy] hierarchy level in the configuration. For more information, see the <i>Junos OS Administration Library for Routing Devices</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>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • show chassis environment on page 815
List of Sample Output	request chassis clock master switch on page 717
Output Fields	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

Syntax	request chassis fabric guided-cabling disable (all-lcc | lcc <i>lcc-number</i>)
Release Information	Command introduced in Junos OS Release 14.1 for TX Matrix Plus routers with 3D SIBs.
Description	Disable the guided cabling operation.
Options	<p>all-lcc—Disable the guided cabling operation for all the LCCs.</p> <p>lcc <i>lcc-number</i>—Disable the guided cabling operation for the specified LCC.</p>
Required Privilege Level	admin
Related Documentation	<ul style="list-style-type: none">• request chassis fabric guided-cabling enable on page 719
List of Sample Output	request chassis fabric guided-cabling disable all-lcc on page 718 request chassis fabric guided-cabling disable lcc 7 on page 718
Output Fields	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

Syntax	<code>request chassis fabric guided-cabling enable (plane-by-plane | port-by-port) (all-lcc | lcc <i>lcc-number</i>)</code>
Release Information	Command introduced in Junos OS Release 14.1 for TX Matrix Plus routers with 3D SIBs.
Description	Enable the guided cabling operation by using blinking LEDs on the ports to be connected on the LCC and the SFC.
Options	<p>plane-by-plane—Enable blinking of CBL 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 CBL 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>port-by-port—Enable blinking of the CBL 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 CBL LED blinks on the next unconnected port on a TXP-F13-3D SIB and a TXP-LCC-3D SIB.</p> <p>all-lcc—Enable the guided cabling operation for all the LCCs.</p> <p>lcc <i>lcc-number</i>—Enable the guided cabling operation for the specified LCC.</p>
Required Privilege Level	admin
Related Documentation	<ul style="list-style-type: none"> request chassis fabric guided-cabling disable on page 718
List of Sample Output	request chassis fabric guided-cabling enable plane-by-plane all-lcc on page 719 request chassis fabric guided-cabling enable port-by-port all-lcc on page 719 request chassis fabric guided-cabling enable plane-by-plane lcc 7 on page 719 request chassis fabric guided-cabling enable port-by-port lcc 7 on page 720
Output Fields	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

Syntax	<code>request chassis fabric plane <i>plane-number</i> (offline | online)</code>
Release Information	<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 12.3 for MX2020 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.</p>
Description	<p>(M120 and MX Series routers and EX8200 switches only) Control the operation of the specified fabric plane.</p> <p>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.</p> <p>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.</p>
Options	<p>offline—Take the fabric plane offline. Use the <code>request chassis fabric plane <i>plane-number</i> offline</code> command to clear a FAULT state on a fabric plane. To bring the fabric plane back online, use the <code>request chassis fabric plane <i>plane-number</i> online</code> command.</p> <p>online—Bring the fabric plane online.</p> <p>plane <i>plane-number</i>—Fabric plane number.</p> <ul style="list-style-type: none"> For the M120 router, replace <i>plane-number</i> with a value from 0 through 3. For the MX480 and MX240 routers, replace <i>plane-number</i> with a value from 0 through 7. For the MX2020 and MX2010 routers, replace <i>plane-number</i> with a value from 0 through 7. For the MX960 router, replace <i>plane-number</i> with a value from 0 through 5. For the EX8208 switch, replace <i>plane-number</i> with a value from 0 through 11. For the EX8216 switch, replace <i>plane-number</i> with a value from 0 through 7.
Required Privilege Level	maintenance

Related Documentation	<ul style="list-style-type: none">• show chassis fabric plane on page 1183• show chassis fabric plane-location on page 1225• show chassis fabric summary on page 1250
List of Sample Output	request chassis fabric plane 0 online on page 722 request chassis fabric plane 0 offline on page 722 request chassis fabric plane 0 online (EX8200 switch) on page 722 request chassis fabric plane (MX2020 Router) on page 722 request chassis fabric plane (MX2010 Router) on page 722
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 feb

List of Syntax	Syntax on page 723 Syntax (ACX Series Routers) on page 723
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 Access Routers.
Description	(M120 router only) Control the operation of the specified Forwarding Engine Board (FEB). (ACX Series routers) Restart the specified FEB.
Options	offline —Take the specified FEB offline. online —Bring the specified FEB online. restart —Restart the specified FEB. slot <i>slot-number</i> —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"> • show chassis feb on page 1306 • show chassis fabric feb on page 1119 • show chassis fpc-feb-connectivity on page 1365 • <i>feb</i> • <i>Understanding Switching Control Board Redundancy</i>
List of Sample Output	request chassis feb offline slot 0 on page 723 request chassis feb online slot 0 on page 723 request chassis feb restart slot 0 on page 724
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

List of Syntax	Syntax on page 725 Syntax (TX Matrix and TX Matrix Plus Routers) on page 725 Syntax (MX Series Routers) on page 725 Syntax (MX2020 3D Universal Edge Routers) on page 725 Syntax (MX2010 3D Universal Edge Routers) on page 725 Syntax (QFabric System) on page 725 Syntax (PTX Series Packet Transport Routers) on page 725
Syntax	<code>request chassis fpc (offline | online | restart) slot <i>slot-number</i></code>
Syntax (TX Matrix and TX Matrix Plus Routers)	<code>request chassis fpc (offline | online | restart) slot <i>slot-number</i> <lcc <i>number</i>></code>
Syntax (MX Series Routers)	<code>request chassis fpc (offline | online | restart) slot <i>slot-number</i> <all-members></code> <code><local></code> <code><member <i>member-id</i>></code>
Syntax (MX2020 3D Universal Edge Routers)	<code>request chassis fpc (offline | online | restart) slot <i>slot-number</i></code>
Syntax (MX2010 3D Universal Edge Routers)	<code>request chassis fpc (offline | online | restart) slot <i>slot-number</i></code>
Syntax (QFabric System)	<code>request chassis fpc</code> <code><interconnect-device <i>name</i> slot <i>slot-number</i> (offline | online)></code> <code><(offline | online) interconnect-device <i>name</i> slot <i>slot-number</i>></code> <code><slot <i>slot-number</i> interconnect-device <i>name</i> (offline | online)></code>
Syntax (PTX Series Packet Transport Routers)	<code>request chassis fpc (offline | online | restart) 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 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 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
Description	<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). For information about the meaning of “FPCs” on the switches, see <i>EX Series Switches Hardware and CLI Terminology Mapping</i>.</p>



NOTE: Beginning in Junos OS Release 12.3, it is possible that FPCs brought offline 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 before Junos OS Release 15.1F3, 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.

Beginning in Junos OS Release 15.1F3 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, it prevents the specified FPC from restarting. Starting in Junos OS Release 15.1, the following message is displayed:

```
user@host> request chassis fpc slot 0 restart
FPC 0 Firmware update in progress. Wait!!!
```



NOTE: The command request chassis fpc (offline | online | restart) slot *slot-number* is not supported on PTX1000 router.

Options **offline**—Take the FPC offline.

online—Bring the FPC online.

interconnect-device *name*—(QFabric systems only) Bring the Flexible Port Concentrator (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 Flexible Port Concentrator (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 Dense Port Concentrator (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 Dense Port Concentrator (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 Dense Port Concentrator (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.
- 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.
- 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 1322](#)
- [show chassis fpc-feb-connectivity on page 1365](#)
- [show chassis fabric fpcs on page 1125](#)
- [Configuring the Junos OS to Make a Flexible PIC Concentrator Stay Offline on page 313](#)
- [Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 333](#)

- *MX960 Flexible PIC Concentrator Description*

List of Sample Output [request chassis fpc on page 729](#)
[request chassis fpc \(MX Series Routers with Media Services Blade \[MSB\]\) on page 729](#)
[request chassis fpc \(MX2020 Router\) on page 729](#)
[request chassis fpc \(MX2010 Router\) on page 729](#)

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 fpm resync

List of Syntax	Syntax on page 730 Syntax (TX Matrix Routers) on page 730 Syntax (TX Matrix Plus Routers) on page 730 Syntax (MX Series Routers) on page 730 Syntax (MX2010 3D Universal Edge Routers) on page 730 Syntax (MX2020 3D Universal Edge Routers) on page 730
Syntax	request chassis fpm resync
Syntax (TX Matrix Routers)	request chassis fpm resync (<i>lcc number</i> | <i>scc</i>)
Syntax (TX Matrix Plus Routers)	request chassis fpm resync (<i>lcc number</i> | <i>sfc number</i>)
Syntax (MX Series Routers)	request chassis fpm resync <all-members> <local> <member <i>member-id</i> >
Syntax (MX2010 3D Universal Edge Routers)	request chassis fpm resync
Syntax (MX2020 3D Universal Edge Routers)	request chassis fpm resync
Release Information	Command introduced before Junos OS Release 7.4. sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6. Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Description	(M40e, M120, M160, M320, MX Series, and T Series routers only) Resynchronize the craft interface status.
Options	all-members —(MX Series routers only) (Optional) Resynchronize the craft interface status on all members of the Virtual Chassis configuration. lcc <i>number</i> —(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number. Replace <i>number</i> with the following values depending on the LCC configuration: <ul style="list-style-type: none">• 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 937](#)
- [Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 333](#)

List of Sample Output [request chassis fpm resync on page 731](#)
[request chassis fpm resync \(MX2010 Router\) on page 731](#)

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

Syntax (TX Matrix and TX Matrix Plus Routers)	request chassis lcc (offline | online) slot <i>slot-number</i>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(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.
Options	<p>offline—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>online—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>slot<i>slot-number</i>—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">• 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	<ul style="list-style-type: none">• show chassis lccs on page 1554• <i>Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade (CLI Procedure)</i>• <i>fpc</i>
List of Sample Output	request chassis lcc on page 733
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	<p>offline—Take the MCS offline.</p> <p>online—Bring the MCS online.</p> <p>restart—Restart the MCS.</p> <p>slot <i>slot-number</i>—MCS slot number. Replace <i>slot-number</i> with 0 or 1.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• show chassis environment mcs on page 959
List of Sample Output	request chassis mcs on page 734
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 3D Universal Edge Routers.
 Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
 Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.

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.

`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 1368](#)

List of Sample Output [request chassis mic online on page 736](#)
[request chassis mic \(MX Routers with Media Services Blade \[MSB\]\) on page 736](#)

[request chassis mic offline \(MX104 Router\) on page 736](#)
[request chassis mic online \(MX2010 Router\) on page 736](#)

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 optics

Syntax	<code>request chassis optics fpc-slot <i>fpc-slot-number</i> reactivate</code>
Release Information	Command introduced in Junos OS Release 12.3 for MX240, MX480, and MX960 3D Universal Edge Routers.
Description	(MX240, MX480, and MX960 routers) Control the status of the optical transceiver.
Options	<p>fpc-slot <i>fpc-slot-number</i>—Slot number of the line card that houses the optical transceiver.</p> <ul style="list-style-type: none"> MX240 router—Replace <i>fpc-slot-number</i> with a value from 0 through 2. MX480 router—Replace <i>fpc-slot-number</i> with a value from 0 through 5. MX960 router—Replace <i>fpc-slot-number</i> with a value from 0 through 11. <p>reactivate—Reactivate the optical transceiver.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> <i>Supported Network Interface Standards by Transceiver for ACX Series, M Series, MX Series, and T Series Routers</i> CHASSISD System Log Messages on page ?
List of Sample Output	request chassis optics (MX480 router) on page 737
Output Fields	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 pcg

Syntax	<code>request chassis pcg (offline | online) slot <i>slot-number</i></code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M40e and M160 routers) Control the operation of the Packet Forwarding Engine (PFE) clock generator (PCG).
Options	offline —Take the PCG offline. online —Bring the PCG online. slot <i>slot-number</i> —PCG slot number. Replace <i>slot-number</i> with 0 or 1.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• show chassis environment pcg on page 976
List of Sample Output	request chassis pcg on page 738
Output Fields	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

List of Syntax	Syntax on page 739 Syntax (ACX4000 Series Routers) on page 739 Syntax (MX Series Routers) on page 739 Syntax (TX Matrix and TX Matrix Plus Routers) on page 739
Syntax	<code>request chassis pic (offline | online) fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i></code>
Syntax (ACX4000 Series Routers)	<code>request chassis pic (offline | online) fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i></code>
Syntax (MX Series Routers)	<code>request chassis pic (offline | online) fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i> <member <i>member-id</i>></code>
Syntax (TX Matrix and TX Matrix Plus Routers)	<code>request chassis pic (offline | online) fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i> <lcc <i>number</i>></code>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. Command introduced in Junos OS Release 12.3 for ACX4000 Routers. Command introduced in Junos OS Release 13.2 for the QFX Series. Option member introduced in Junos OS Release 14.2 for MX Series routers.
Description	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.
- 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.
- 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 1368](#)
- [show chassis pic on page 1570](#)

List of Sample Output [request chassis pic on page 742](#)
[request chassis pic online member \(MX Series Routers\) on page 742](#)
[request chassis pic offline member \(MX Series Routers\) on page 743](#)

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 redundancy feb slot

Syntax	<code>request chassis redundancy feb slot <i>slot-number</i> (switch-to-backup | revert-from-backup)</code>
Release Information	Command introduced in Junos OS Release 8.2.
Description	(M120 routers only) Control the operation of the specified Forwarding Engine Board (FEB) in a redundancy group.
Options	<p><i>slot-number</i>—FEB slot number. Replace <i>slot-number</i> with a value from 0 through 5.</p> <p><i>switch-to-backup</i>—Initiate a switchover from the specified active FEB to the backup FEB for the redundancy group.</p> <p><i>revert-from-backup</i>—Initiate a revert to the specified FEB following a switchover to the backup FEB for a redundancy group.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• show chassis redundancy feb on page 1610• <i>Configuring FEB Redundancy on the M120 Router</i>• <i>Understanding Switching Control Board Redundancy</i>
List of Sample Output	request chassis redundancy feb slot 2 switch-to-backup on page 744 request chassis redundancy feb slot 3 revert-to-backup on page 744
Output Fields	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

List of Syntax	Syntax on page 745 Syntax (M Series, MX Series, T Series Routers) on page 745 Syntax (TX Matrix Routers) on page 745 Syntax (TX Matrix Plus Routers) on page 745 Syntax (MX Series Virtual Chassis) on page 745 Syntax (QFX Series) on page 745
Syntax	request chassis routing-engine master (acquire | release | switch) <no-confirm>
Syntax (M Series, MX Series, T Series Routers)	request chassis routing-engine master (acquire | release | switch) <no-confirm> <check>
Syntax (TX Matrix Routers)	request chassis routing-engine master (acquire | release | switch) (lcc <i>number</i> | scc | all-chassis) <no-confirm>
Syntax (TX Matrix Plus Routers)	request chassis routing-engine master (acquire | release | switch) (lcc <i>number</i> | sfc | all-chassis | all-lcc) <no-confirm>
Syntax (MX Series Virtual Chassis)	request chassis routing-engine master (acquire | release | switch) <all-members> <check> <local> <member <i>member-id</i> > <no-confirm>
Syntax (QFX Series)	request chassis routing-engine master (release | switch) <check> <interconnect-device <i>name</i> > <node-group <i>name</i> > <no-confirm>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>all-chassis option added in Junos OS Release 8.0.</p> <p>Command introduced in Junos OS Release 9.0 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 Release 11.3 for QFX Series.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
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 *Junos OS High Availability Library for Routing Devices*.



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, and MX2020 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 for Routing Devices*

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 1613](#)
- *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 748](#)
[request chassis routing-engine master switch on page 748](#)
[request chassis routing-engine master switch check on page 749](#)

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

List of Syntax	Syntax on page 750 Syntax (TX Matrix and TX Matrix Plus Routers) on page 750
Syntax	request chassis scg (offline | online) slot <i>slot-number</i>
Syntax (TX Matrix and TX Matrix Plus Routers)	request chassis scg lcc <i>number</i> (offline | online) slot <i>slot-number</i>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(T Series routers only) Control the operation of the specified SONET Clock Generator (SCG).
Options	<p>lcc <i>number</i>—(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">• 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. <p>offline—Take the SCG offline. When you change the SCG status to offline, the unit is not powered down.</p> <p>online—Bring the SCG online.</p> <p>slot <i>slot-number</i>—SCG slot number. Replace <i>slot-number</i> with 0 or 1.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• show chassis environment scg on page 1003• <i>Configuring the Clock Source</i>• <i>T320 SONET Clock Generator (SCG) Description</i>
List of Sample Output	request chassis scg on page 751
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

Syntax	<code>request chassis sfb (offline | online) slot <i>slot-number</i></code> <code><all-members></code> <code><local></code> <code><member <i>member-id</i>></code>
Release Information	Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers. all-members , local , and member <i>member-id</i> options introduced in Junos OS Release 15.1 for MX2020 and MX2010 routers.
Description	Control the operation of the Switch Fabric Board (SFB).
Options	all-members —(Optional) Control the operation of the SFB in all members of the Virtual Chassis configuration. local —(Optional) Control the operation of the SFB in the local Virtual Chassis member. member <i>member-id</i> —(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. offline —Take the Switch Fabric Board offline. online —Bring the Switch Fabric Board online. slot <i>slot-number</i> —Switch Fabric Board slot number. Replace <i>slot-number</i> with a value of 0 through 7.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• show chassis sfb on page 1641
List of Sample Output	request chassis sfb on page 752 request chassis sfb (MX2010 Routers) on page 752
Output Fields	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 sfm master switch

Syntax	request chassis sfm master switch <no-confirm>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M40e and M160 routers only) Control which Switching and Forwarding Module (SFM) is master.
Options	no-confirm —(Optional) Do not display a switch warning or query.
Additional Information	<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 sfm statement at the [edit chassis redundancy] hierarchy level in the configuration. For more information, see the <i>Junos OS Administration Library for Routing Devices</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>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • show chassis sfm on page 1643 • <i>Switching the Global Master and Backup Roles in a Virtual Chassis Configuration</i>
List of Sample Output	request chassis sfm master switch on page 753 request chassis sfm master switch no-confirm on page 753
Output Fields	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

Syntax	<code>request chassis sfm (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 specified Switching and Forwarding Module (SFM).
Options	<p>offline—Take the SFM offline.</p> <p>online—Bring the SFM online.</p> <p>restart—Restart the SFM.</p> <p>slot <i>slot-number</i>—SFM slot number. Replace <i>slot-number</i> with a value from 0 through 3.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• show chassis sfm on page 1643• <i>Configuring SFM Redundancy on M40e and M160 Routers</i>• <i>M40e Switching and Forwarding Module (SFM) Description</i>
List of Sample Output	request chassis sfm (M40e) on page 754 request chassis sfm (M160) on page 754
Output Fields	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

List of Syntax	Syntax on page 755 Syntax (TX Matrix Router) on page 755 Syntax (TX Matrix Plus Router) on page 755
Syntax	<code>request chassis sib (offline | online) slot <i>slot-number</i></code>
Syntax (TX Matrix Router)	<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>
Syntax (TX Matrix Plus Router)	<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>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>f13 and f2s options for the TX Matrix Plus router introduced in Junos OS Release 9.6.</p>
Description	(M320 routers and T Series routers only) Control the operation of the specified Switch Interface Board (SIB).
Options	<p>all-chassis—(TX Matrix routers only) Control the status of the specified SIB.</p> <p>all-lcc—(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>f13 <i>slot-number</i>—Control the operation of F13 SIBs. Replace <i>slot-number</i> with a value 0, 1, 3, 4, 6, 7, 8, 9, 11, or 12.</p> <p>f2s <i>sib-slot/sib-f2s-slot-number</i>—(TX Matrix Plus routers only) (Optional) Control the operation of the SIB F2s. Replace <i>sib-slot</i> with a value from 0 through 4, followed by a <i>sib-f2s-slot-number</i> value 0, 2, 4 or 6.</p> <p>lcc <i>number</i>—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number. Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> • 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. <p>scc—(TX Matrix router only) TX Matrix router (switch-card chassis) on a routing matrix.</p> <p>offline—Take the SIB offline.</p>



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 [“Traffic Black Hole Caused by Fabric Degradation” on page 401](#).

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 1646](#)
- [show chassis environment sib on page 1022](#)
- [Configuring the Junos OS to Upgrade and Downgrade Switch Interface Boards on a TX Matrix Router on page 222](#)
- [M320 SIB Description](#)

List of Sample Output [request chassis sib on page 756](#)
[request chassis sib on page 757](#)

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

List of Syntax	Syntax on page 758 Syntax (TX Matrix Plus Router) on page 758
Syntax	request chassis sib f13 train-link-receive slot <i>SFC-SIB-F13-slot-num</i>
Syntax (TX Matrix Plus Router)	request chassis sib f13 train-link-receive slot <i>SFC-SIB-F13-slot-num</i>
Release Information	Command introduced in Junos OS Release 10.1.
Description	(TX Matrix Plus router only) Control the receiving link of the specified Switch Interface Board (SIB) of the SFC.
Options	slot <i>SFC-SIB-F13-slot-num</i> — SFC SIB slot number. Replace it with 0, 3, 6, 8 or 11.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• request chassis sib f13 train-link-transmit slot on page 759• Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 239
List of Sample Output	request chassis sib f13 train-link-receive slot on page 758
Output Fields	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

Syntax	<code>request chassis sib f13 train-link-transmit slot <i>SFC-SIB-F13-slot-num</i></code>
Release Information	Command introduced in Junos OS Release 10.1.
Description	(TX Matrix Plus router only) Control the transmission link of the specified Switch Interface Board (SIB) of the SFC.
Options	<code>slot <i>SFC-SIB-F13-slot-num</i></code> —SFC SIB slot number. Replace it with 0, 3, 6, 8 or 11.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • request chassis sib f13 train-link-receive slot on page 758 • Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 239
List of Sample Output	request chassis sib f13 train-link-transmit slot on page 759
Output Fields	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

Syntax	<code>request chassis sib optics lcc <i>number</i> sib-slot <i>number</i> optics-slot <i>number</i> (enable | disable)</code>
Release Information	Command introduced in Junos OS Release 13.1 for TX Matrix Routers with 3D SIBs.
Description	(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.
Options	<p>lcc <i>number</i>—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">• 0 through 7, 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. <p>sib-slot <i>number</i>—SIB slot number. Replace the <i>number</i> with a value from 0 to 15.</p> <p>optics-slot <i>number</i>—Optics slot number for high-speed link cable. Replace the <i>number</i> with a value from 0 to 15.</p> <p>enable—Start the high-speed linkss on the cables and enable the FPCs.</p> <p>disable—Disable the FPCs and stop the high-speed links on the cables.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• show chassis fabric optical-links
List of Sample Output	request chassis sib optics lcc on page 760 request chassis sib optics lcc on page 760
Output Fields	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

Syntax	<code>request chassis sib optics sfc <i>slot-number</i> sib-slot <i>number</i> optics-slot <i>number</i> (enable | disable)</code>
Release Information	Command introduced in Junos OS Release 13.1 for TX Matrix Routers with 3D SIBs.
Description	(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.
Options	<p>sfc <i>slot-number</i>—SFC slot number. Replace the <i>slot-number</i> with 0.</p> <p>sib-slot <i>number</i>—SIBslot number. Replace the <i>number</i> with a value from 0 to 15.</p> <p>optics-slot <i>number</i>—Optics slot number for high-speed link cable. Replace the <i>number</i> with a value from 0 to 15.</p> <p>enable—Start the high-speed links on the cables and enable the FPCs.</p> <p>disable—Disable the FPCs and stop the HSLs on the cables.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • show chassis fabric optical-links
List of Sample Output	request chassis sib optics sfc on page 761 request chassis sib optics sfc on page 761
Output Fields	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

Syntax	<code>request chassis sib train-link-receive slot <i>LCC-SIB-ST-SIB-L-slot-num</i></code>
Release Information	Command introduced in Junos OS Release 10.1.
Description	(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.
Options	<code>slot <i>LCC-SIB-ST-SIB-L-slot-num</i></code> — LCC SIB slot number. Replace it with a value from 0 through 4.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• request chassis sib train-link-transmit slot on page 763• Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 239
List of Sample Output	request chassis sib train-link-receive slot on page 762
Output Fields	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

List of Syntax	Syntax on page 763 Syntax (TX Matrix Plus Routing Platform) on page 763
Syntax	request chassis sib train-link-transmit slot <i>LCC-SIB-ST-SIB-L-slot-num</i>
Syntax (TX Matrix Plus Routing Platform)	request chassis sib train-link-receive slot <i>LCC-SIB-ST-SIB-L-slot-num</i>
Release Information	Command introduced in Junos OS Release 10.1.
Description	(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.
Options	slot <i>LCC-SIB-ST-SIB-L-slot-num</i> — LCC SIB slot number. Replace it with a value from 0 through 4.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • request chassis sib train-link-receive slot on page 762 • Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 239
List of Sample Output	request chassis sib train-link-transmit slot on page 763
Output Fields	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

List of Syntax	Syntax on page 764 Syntax (MX2020 and MX2010 Routers) on page 764 Syntax (TX Matrix Router) on page 764 Syntax (TX Matrix Plus Router) on page 764
Syntax	<code>request chassis spmb restart slot <i>slot-number</i></code>
Syntax (MX2020 and MX2010 Routers)	<code>request chassis spmb restart slot <i>slot-number</i></code> <code><all-members></code> <code><local></code> <code><member <i>member-id</i>></code>
Syntax (TX Matrix Router)	<code>request chassis spmb restart (lcc <i>number</i> | scc) slot <i>slot-number</i></code>
Syntax (TX Matrix Plus Router)	<code>request chassis spmb restart (lcc <i>number</i> | sfc <i>number</i>) slot <i>slot-number</i></code>
Release Information	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 12.3 for MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers. all-members , local , and member <i>member-id</i> options introduced in Junos OS Release 15.1 for MX2020 and MX2010 routers.
Description	Restart the specified Switch Processor Mezzanine Board (SPMB) on the Control Board (CB).
Options	<p>all-members—(MX2010 and MX2020 routers only) (Optional) Restart the SPMB on the CB in all members of the Virtual Chassis configuration.</p> <p>lcc <i>number</i>—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number. Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none">• 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. <p>local—(MX2010 and MX2020 routers only) (Optional) Restart the SPMB on the CB in the local Virtual Chassis member.</p>

member *member-id*—(MX2010 and MX2020 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 1657](#)
- [show chassis spmb sibs on page 1667](#)

List of Sample Output [request chassis spmb restart on page 765](#)
[request chassis spmb restart \(MX2010 Router\) on page 765](#)

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 synchronization mode

Syntax	request chassis synchronization mode (free-run | holdover | auto-select)
Release Information	Command introduced in Junos OS Release 11.2R4 for MX Series 3D Universal Edge Routers.
Description	(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.
Options	freerun —Change chassis synchronization to free-run mode. holdover —Change chassis synchronization to holdover mode. auto-select —Change chassis synchronization to auto-select mode.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• Synchronous Ethernet Overview on page 149• Configuring an External Clock Synchronization Interface for MX Series Routers on page 353
List of Sample Output	request chassis synchronization mode freerun on page 766 request chassis synchronization mode holdover on page 766 request chassis synchronization mode auto-select on page 766
Output Fields	When you enter this command, the current status of your request is displayed. <ul style="list-style-type: none">• 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 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 768 Syntax (M Series, T Series) on page 768 Syntax (PTX Series) on page 768
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.
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	<p>external-a—(Routing matrix only) Change the synchronization source to external source A.</p> <p>external-b—(Routing matrix only) Change the synchronization source to external source B.</p> <p>bits-a—(PTX Series only) Change the synchronization source to the BITS external source A.</p> <p>bits-b—(PTX Series only) Change the synchronization source to the BITS external source B.</p> <p>fpc-slot-number—(PTX Series only) Change the synchronization source to an FPC in the slot specified. For the PTX5000 Packet Transport Router, replace <i>slot-number</i> with a value from 0 through 7.</p> <p>gps-0-10mhz—(PTX Series only) Change the synchronization source to the 10 MHz GPS source on CCG port 0.</p> <p>gps-0-5mhz—(PTX Series only) Change the synchronization source to the 5 MHz GPS source on CCG port 0.</p> <p>gps-1-10mhz—(PTX Series only) Change the synchronization source to the 10 MHz GPS source on CCG port 1.</p> <p>gps-1-5mhz—(PTX Series only) Change the synchronization source to the 5 MHz GPS source on CCG port 1.</p>

Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• show chassis synchronization on page 1673• Configuring Clock Synchronization Interface on MX Series Routers on page 353• <i>Supported Time Synchronization Standard</i>
List of Sample Output	request chassis synchronization switch (M Series, T Series) on page 769 request chassis synchronization switch (PTX Series) on page 769
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

List of Syntax	Syntax on page 770 Syntax (TX Matrix Router) on page 770 Syntax (TX Matrix Plus Router) on page 770
Syntax	set chassis display message " <i>message</i> " <permanent>
Syntax (TX Matrix Router)	set chassis display message " <i>message</i> " (<i>lcc number</i> | <i>scc</i>) <permanent>
Syntax (TX Matrix Plus Router)	set chassis display message " <i>message</i> " (<i>fpc-slot slot-number</i> | <i>lcc number</i> | <i>sfc number</i>) <permanent>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. <i>sfc</i> option for TX Matrix Plus router introduced in Junos OS Release 9.6.
Description	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.



NOTE: On T Series routers, when this command is executed with the **permanent** option, the display of the text message alternates with that of the standard craft interface message continuously every 60 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.

Options **"message"**—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.

fpc-slot slot-number—(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 **slot-number** with a value from 0 through 31. On the switch, display the text message for a specific member of a Virtual Chassis, where **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 705](#)
- [show chassis craft-interface on page 799](#)

List of Sample Output [set chassis display message \(Creating\) on page 771](#)
[set chassis display message \(Deleting\) on page 772](#)

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 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 legend](#)
- [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](#)
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- [show chassis fabric degraded-fabric-reachability](#)
- [show chassis fabric unreachable-destinations](#)
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- [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 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 clock`
- `show ptp hybrid`
- `show ptp lock-status`
- `show ptp master`
- `show ptp path-trace detail`
- `show ptp port`
- `show ptp slave`
- `show synchronous-ethernet esmc statistics`
- `show synchronous-ethernet esmc transmit`
- `show synchronous-ethernet global-information`

show chassis adc

Syntax	show chassis adc <all-members> <local> <member <i>member-id</i> >
Release Information	Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers. all-members , local , and member <i>member-id</i> options introduced in Junos OS Release 15.1 for MX2020 and MX2010 routers.
Description	Display chassis information about the adapter cards (ADCs).
Options	<p>none—Display information about all adapter cards.</p> <p>all-members—(Optional) Display information about the adapter cards (ADCs) in all members of the Virtual Chassis configuration.</p> <p>local—(Optional) Display information about the ADCs in the local member of the Virtual Chassis.</p> <p>member <i>member-id</i>—(Optional) Display information about the ADCs in the specified member of the Virtual Chassis. Replace <i>member-id</i> with the value 0 or 1.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> show chassis environment adc on page 879
List of Sample Output	show chassis adc (MX2020 Router) on page 777 show chassis adc (MX2010 Router) on page 777
Output Fields	Table 49 on page 776 lists the output fields for the show chassis adc command. Output fields are listed in the approximate order in which they appear.

Table 49: show chassis adc Output Fields

Field Name	Field Description
Slot	Slot number.
State	Status of the adapter card. <ul style="list-style-type: none"> Online—The adapter card is online and running. Offline—Adapter card is powered down.
Uptime	How long the Routing Engine has been connected to the adapter card and, therefore, how long the adapter card has been up and running.

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 afeb

Syntax	show chassis afeb
Release Information	Command introduced in Junos OS Release 13.2.
Description	Display compact Forwarding Engine Board status.
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> request chassis afeb on page 710
List of Sample Output	show chassis afeb (MX104 Router) on page 779
Output Fields	Table 50 on page 778 lists the output fields for the show chassis afeb command. Output fields are listed in the approximate order in which they appear.

Table 50: show chassis afeb

Field Name	Field Description
State	<p>State of the compact Forwarding Engine Board:</p> <ul style="list-style-type: none"> • Offline—FEB is powered down. • Online—FEB is operational and running. • Check—FEB is in alarmed state because of the following reasons: <ul style="list-style-type: none"> • Hardware error. • PFE is unable to boot.
Temperature	Temperature of the air passing by the FEB, in degrees Celsius or in both degrees Celsius and degrees Fahrenheit.
CPU Utilization	Total percentage of CPU being used.
Interrupt Utilization	Of the total CPU being used by the FEB processor, the percentage being used for interrupts.
Heap Utilization	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).
Buffer Utilization	Percentage of buffer space being used by the FEB processor for buffering internal messages.
Total CPU DRAM	Total DRAM, in megabytes, available to the FEB processor.
Start time	Time when the Routing Engine detected that the FEB was running.
Uptime	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 780 Syntax (TX Matrix Routers) on page 780 Syntax (TX Matrix Plus Routers) on page 780 Syntax (MX Series Routers) on page 780 Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers) on page 780 Syntax (QFX Series) on page 780 Syntax (OCX Series) on page 780 Syntax (PTX Series Packet Transport Routers) on page 780 Syntax (ACX Series Universal Access Routers) on page 780
Syntax	show chassis alarms
Syntax (TX Matrix Routers)	show chassis alarms <lcc <i>number</i> | scc>
Syntax (TX Matrix Plus Routers)	show chassis alarms <lcc <i>number</i> | sfc <i>number</i> >
Syntax (MX Series Routers)	show chassis alarms <all-members> <local> <member <i>member-id</i> >
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)	show chassis alarms <satellite [slot-id <i>slot-id</i>]>
Syntax (QFX Series)	show chassis alarms <interconnect-device <i>name</i> > <node-device <i>name</i> >
Syntax (OCX Series)	show chassis alarms
Syntax (PTX Series Packet Transport Routers)	show chassis alarms
Syntax (ACX Series Universal Access Routers)	show chassis alarms
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. sfc option for the TX Matrix Plus router introduced in Junos OS Release 9.6. Command introduced in Junos OS Release 11.1 for the QFX Series. Command introduced in Junos OS Release 12.1 for the PTX Series Packet Transport Routers.

Command introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers.

Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.

Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.

Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

satellite option introduced in Junos OS Release 14.2R3 for Junos Fusion.

Description Display information about the conditions that have been configured to trigger alarms.

Options **none**—Display information about the conditions that have been configured to trigger alarms.

all-members—(MX Series routers only) (Optional) Display information about alarm conditions for all the member routers of the Virtual Chassis configuration.

interconnect-device *name*—(QFabric systems only) (Optional) Display information about alarm conditions 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 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 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.

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 sonic 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_ILLEGALSIZERR	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
<hr/>	
Chip Type: R Chip	Code
CMALARM_RCHIP_SRAM_PARITY_ERR	512
<hr/>	
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 = $(\text{Error Code})/2$

Required Privilege Level view

- Related Documentation**
- [Configuring an Alarm Entry and Its Attributes](#)
 - [Chassis Conditions That Trigger Alarms](#) on page 433

- List of Sample Output**
- [show chassis alarms \(Alarms Active\)](#) on page 787
 - [show chassis alarms \(No Alarms Active\)](#) on page 787
 - [show chassis alarms \(Fan Tray\)](#) on page 787
 - [show chassis alarms \(MX104 Router\)](#) on page 787
 - [show chassis alarms \(MX2010 Router\)](#) on page 787
 - [show chassis alarms \(MX2020 Router\)](#) on page 787
 - [show chassis alarms \(MX960, MX480, and MX240 Routers showing Major CB Failure\)](#) on page 788
 - [show chassis alarms \(T4000 Router\)](#) on page 788
 - [show chassis alarms \(Unreachable Destinations Present on a T Series Router\)](#) on page 788
 - [show chassis alarms \(FPC Offline Due to Unreachable Destinations on a T Series Router\)](#) on page 788
 - [show chassis alarms \(SCG Absent on a T Series Router\)](#) on page 789
 - [show chassis alarms \(Alarms Active on a TX Matrix Router\)](#) on page 789
 - [show chassis alarms \(TX Matrix Plus router with 3D SIBs\)](#) on page 789
 - [show chassis alarms \(Alarms on a T4000 Router After the enhanced-mode Statement is Enabled\)](#) on page 791
 - [show chassis alarms \(Backup Routing Engine\)](#) on page 791
 - [show chassis alarms \(EX Series Switch\)](#) on page 792
 - [show chassis alarms \(Alarms Active on the QFX Series and OCX Series Switches\)](#) on page 792
 - [show chassis alarms node-device \(Alarms Active on the QFabric System\)](#) on page 792
 - [show chassis alarms \(Alarms Active on the QFabric System\)](#) on page 792
 - [show chassis alarms \(Alarms Active on an EX8200 Switch\)](#) on page 792
 - [show chassis alarms \(Alarms Active on a PTX5000 Packet Transport Router\)](#) on page 793
 - [show chassis alarms \(Mix of PDUs Alarm on a PTX5000 Packet Transport Router with FPC2-PTX-PIA\)](#) on page 793
 - [show chassis alarms \(PDU Converter Failed Alarm on a PTX5000 Packet Transport Router with FPC2-PTX-PIA\)](#) on page 793
 - [show chassis alarms \(No Power for System Alarm on a PTX5000 Packet Transport Router with FPC2-PTX-PIA\)](#) on page 794
 - [show chassis alarms \(Alarms Active on an ACX2000 Universal Access Router\)](#) on page 794
 - [show chassis alarms \(Active Alarm to Indicate Status of the Bad SCB Clock on MX Series\)](#) on page 794
 - [show chassis alarms \(Active Alarms on PTX5000, MX240, MX480, MX960, MX2010, and MX2020 Routers with Smart Disk Error\)](#) on page 794
- Output Fields**
- Table 51 on page 787 lists the output fields for the **show chassis alarms** command. Output fields are listed in the approximate order in which they appear.

Table 51: 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: Minor or Major .
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 (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 (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 (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 ED3691
node-device ED3694
3 alarms currently active
Alarm time          Class  Description
2011-08-24 16:04:15 UTC Major  ED3694:fte-0/1/2: Link down
2011-08-24 16:04:14 UTC Major  ED3694:fte-0/1/0: Link down
2011-08-24 14:21:14 UTC Major  ED3694 PEM 0 is not supported/powered
```

show chassis alarms (Alarms Active on the QFabric System)

```
user@switch> show chassis alarms
IC-A0001:
-----
1 alarms currently active
Alarm time          Class  Description
2011-08-24 16:04:15 UTC Minor  Backup RE Active

ED3694:
-----
3 alarms currently active
Alarm time          Class  Description
2011-08-24 16:04:15 UTC Major  ED3694:fte-0/1/2: Link down
2011-08-24 16:04:14 UTC Major  ED3694:fte-0/1/0: Link down
2011-08-24 14:21:14 UTC Major  ED3694 PEM 0 is not supported/powered

SNG-0:
-----

NW-NG-0:
-----
1 alarms currently active
Alarm time          Class  Description
2011-08-24 15:49:27 UTC Major  ED3691 PEM 0 is not supported/powered
```

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 (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-P1A)

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
2013-03-19 23:03:48 PDT  Minor  Mix of PDUs
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-P1A)

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-P1A)

```
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 Access 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 (Active Alarms on PTX5000, MX240, MX480, MX960, MX2010, and MX2020 Routers with Smart Disk Error)

```
user@host> show chassis alarms
4 alarms currently active
Alarm time          Class Description
2016-01-11 16:02:10 UTC MINOR Host 0 disk drive 2 smart error
2016-01-11 16:02:10 UTC MINOR Host 0 disk drive 1 smart error
2016-01-11 16:02:05 UTC MINOR Host 1 disk drive 2 smart error
2016-01-11 16:02:05 UTC MINOR Host 1 disk drive 1 smart error
```

show chassis cfeb

Syntax	show chassis cfeb
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M7i and M10i routers only) Display status information about the Compact Forwarding Engine Board (CFEB).
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • request chassis cfeb on page 715 • <i>Configuring CFEB Redundancy on the M10i Router</i> • <i>CFEB Overview</i>
List of Sample Output	show chassis cfeb (M7i) on page 796 show chassis cfeb (M10i) on page 796
Output Fields	Table 52 on page 795 lists the output fields for the show chassis cfeb command. Output fields are listed in the approximate order in which they appear.

Table 52: show chassis cfeb Output Fields

Field Name	Field Description
State	Status of the CFEB: <ul style="list-style-type: none"> • Online—CFEB is online and running. • Offline—CFEB is powered down.
Intake Temperature	Temperature of the air before flowing past the CFEB.
Exhaust Temperature	Temperature of the air after flowing past the CFEB.
CPU utilization	Percentage of CPU being used by the CFEB processor.
Interrupt utilization	Of the total CPU being used by the CFEB processor, the percentage being used for interrupts
Heap Utilization	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).
Buffer Utilization	Percentage of buffer space being used by the CFEB processor for buffering internal messages
Total CPU DRAM	Amount of DRAM available to the CFEB CPU.

Table 52: show chassis cfep Output Fields (*continued*)

Field Name	Field Description
Internet Processor II	Information about the CFEB processor.
Start time	Time when the Routing Engine detected that the CFEB was running.
Uptime	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

Syntax (TX Matrix Plus Router)	show chassis cip
Release Information	Command introduced in Junos OS Release 9.6.
Description	(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.
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • request chassis cip on page 716 • <i>Installing a T1600 CIP</i> • <i>Installing a T640 CIP</i> • <i>Installing a TX-CIP</i> • <i>Installing an M320 CIP</i> • <i>Installing an M320 CIP</i> • <i>Installing the T320 CIP</i> • <i>CIP Overview</i>
Output Fields	Table 53 on page 797 lists the output fields for the show chassis cip command. Output fields are listed in the approximate order in which they appear.

Table 53: 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 .
Port	<p>Physical port number of the Ethernet switch:</p> <ul style="list-style-type: none"> • 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. <p>NOTE: The current configuration of the routing matrix based on a TX Matrix Plus router supports only one SFC.</p> <ul style="list-style-type: none"> • Port numbers 0 to 15 on Ethernet switch 1 can be used to connect up to 16 LCCs. <p>NOTE: 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.</p>

Table 53: show chassis cip Output Fields (*continued*)

Field Name	Field Description
Type	Type of CIP: <ul style="list-style-type: none"> XE—Ethernet switch 0 ports used for connections to the SFC control plane or other devices such as JCS1200. GE—Ethernet switch 1 ports used for connections to the LCC control plane.
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: Up or Down .
Speed	Ethernet link speed.
Duplex	Type of Ethernet link: Full or Half Duplex .
Auto-neg	Status of autonegotiation for the CIP connection to the LCC, SFC, or other devices: On or Off .

show chassis cip (TX Matrix Plus Router)

```

user@host> 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

List of Syntax	Syntax on page 799 Syntax (MX Series Routers) on page 799 Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers) on page 799 Syntax (TX Matrix Routers) on page 799 Syntax (TX Matrix Plus Routers) on page 799 Syntax (ACX Series Universal Access Routers) on page 799
Syntax	show chassis craft-interface
Syntax (MX Series Routers)	show chassis craft-interface <all-members> <local> <member <i>member-id</i> >
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)	show chassis craft-interface
Syntax (TX Matrix Routers)	show chassis craft-interface <lcc <i>number</i> | scc>
Syntax (TX Matrix Plus Routers)	show chassis craft-interface <lcc <i>number</i> | sfc <i>number</i> >
Syntax (ACX Series Universal Access Routers)	show chassis craft-interface
Release Information	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 Access Routers. Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers. Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.
Description	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	<p>none—(TX Matrix, TX Matrix Plus routers, MX104, MX2010, and MX2020 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.</p> <p>all-members—(MX Series routers only) (Optional) Display information currently on the craft interface for all members of the Virtual Chassis configuration.</p>

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 705](#)
- [set chassis display message on page 770](#)

List of Sample Output

[show chassis craft-interface \(M20 Router\) on page 802](#)
[show chassis craft-interface \(M40 Router\) on page 802](#)
[show chassis craft-interface \(M120 Router\) on page 803](#)
[show chassis craft-interface \(M160 Router\) on page 803](#)
[show chassis craft-interface \(MX104 Router\) on page 804](#)
[show chassis craft-interface \(MX2010 Router\) on page 805](#)
[show chassis craft-interface \(MX2020 Router\) on page 805](#)
[show chassis craft-interface \(T4000 Router\) on page 806](#)
[show chassis craft-interface \(TX Matrix Routing Matrix\) on page 807](#)
[show chassis craft-interface \(TX Matrix Plus Routing Matrix\) on page 809](#)

[show chassis craft-interface \(TX Matrix Plus router with 3D SIBs\) on page 812](#)

[show chassis craft-interface \(ACX2000 Universal Access Router\) on page 814](#)

Output Fields [Table 54 on page 801](#) lists the output fields for the **show chassis craft-interface** command. Output fields are listed in the approximate order in which they appear.

Table 54: 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"> • router-name—Name of the router. • Up—How long the router has been operational, in days, hours, minutes, and seconds. • message—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 set chassis display 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.
SFC Front Panel Switch Settings	<p>(TX Matrix Plus Routers)—Display the SFC front panel switch settings:</p> <p>SFC Chassis Number and Config Size 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"> • SFC Chassis Number—This field always displays the value 00. • Config Size—The value of this field is 0 for the TX Matrix Plus router. The value of this field is 3 for TX Matrix Plus router with 3D SIBs.
Front Panel System LEDs	(MX104, MX2010, and MX2020 Routers) Status of the Front Panel System LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.
Front Panel Alarm Indicators	(MX104, MX2010, and MX2020 Routers) Status of the Front Panel Alarm indicators. A dot (.) indicates the relay is off. An asterisk (*) indicates the relay is active.
Input Relay	Status of the configured input relay ports—0 through 3. The mode is normally open or closed. The status is clear or raised.
Output Relay	Status of the configured output ports—0 or 1. The mode is normally open or closed. The status is clear or raised.
Front Panel FPC LEDs	(MX2010 and MX2020 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 routers, there are 10 (0-9) FPCs LEDs. On MX2020 routers, there are 20 (0-9 and 10-19) FPCs LEDs.
CB LEDs	Status of the Control Board (CB) LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.
PS LEDs	(MX2010 and MX2020 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 routers, there are 9 (0-8) PS LEDs. On MX2020 routers, there are 18 (0-8 and 9-17) PS LEDs.
PS Status	(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.

Table 54: show chassis craft-interface Output Fields (*continued*)

Field Name	Field Description
FAN Tray LEDs	(MX2010 and MX2020 Routers) Status of the Fan Tray LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.
Front Panel SFB LEDs	(MX2010 and MX2020 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.
Front Panel Chassis Info	(MX2010 and MX2020 Routers) Information about the chassis such as the chassis number and role. User can set the chassis number in multi-chassis configurations.
MCS and SFM LEDs	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.
SIB LEDs	Status of the Switch Interface Board (SIB) LEDs. A dot (.) indicates the LED is not lit. An asterisk (*) indicates the LED is lit.
SCG LEDs	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 (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 (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	.	*

Fan Tray LEDs:

FT	0	1	2	3	4	5
Red	*
Green	*	*	*	*	*	.

CB LEDs:

CB	0	1
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	*	.

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 (ACX2000 Universal Access 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

List of Syntax	Syntax on page 815 Syntax (T320, T640, T1600, and T4000 Routers) on page 815 Syntax (TX Matrix Routers) on page 815 Syntax (TX Matrix Plus Routers) on page 815 Syntax (MX Series Routers) on page 815 Syntax (MX104 3D Universal Edge Routers) on page 815 Syntax (MX2010 and MX2020 3D Universal Edge Routers) on page 816 Syntax (EX8200 Switches) on page 816 Syntax (EX Series Switches except EX8200) on page 816 Syntax (QFX Series) on page 816 Syntax (OCX Series) on page 816 Syntax (PTX Series Packet Transport Routers) on page 816 Syntax (ACX Series Universal Access Routers) on page 817
Syntax	show chassis environment
Syntax (T320, T640, T1600, and T4000 Routers)	show chassis environment <code><cb <i>cb-slot-number</i>></code> <code><fpc <i>fpc-slot-number</i>></code> <code><fpm></code> <code><pem <i>pem-slot-number</i>></code> <code><routing-engine <i>re-slot-number</i>></code> <code><scg <i>scg-slot-number</i>></code> <code><sib <i>sib-slot-number</i>></code>
Syntax (TX Matrix Routers)	show chassis environment <code><lcc <i>number</i> | scc></code>
Syntax (TX Matrix Plus Routers)	show chassis environment <code><cb <i>cb-slot-number</i>></code> <code><cip <i>cip-slot-number</i>></code> <code><fpc <i>fpc-slot-number</i>></code> <code><fpm></code> <code><lcc <i>number</i>></code> <code><pem <i>pem-slot-number</i>></code> <code><routing-engine <i>re-slot-number</i>></code> <code><scg <i>scg-slot-number</i>></code> <code>< sfc <i>number</i>></code> <code><sib <i>sib-slot-number</i>></code>
Syntax (MX Series Routers)	show chassis environment <code><all-members></code> <code><local></code> <code><member <i>member-id</i>></code>
Syntax (MX104 3D Universal Edge Routers)	show chassis environment <code><cb></code> <code><pem <i>pem-slot-number</i>></code> <code><routing-engine <i>re-slot-number</i>></code>

Syntax (MX2010 and MX2020 3D Universal Edge Routers)	<pre>show chassis environment <adc <i>adc-slot-number</i>> <all-members> <cb <i>cb-slot-number</i>> <fan <i>fantray-slot-number</i>> <fpc <i>fpc-slot-number</i>> <fpm> <local> <member <i>member-id</i>> <monitored> <psm <i>psm-slot-number</i>> <routing-engine <i>re-slot-number</i>> <sfb <i>sfb-slot-number</i>> <satellite [<i>slot-id slot-id</i> |device-alias <i>alias-name</i>]></pre>
Syntax (EX8200 Switches)	<pre>show chassis environment <all-members> <cb <i>cb-slot-number</i>> <fpc <i>fpc-slot-number</i>> <local> <member <i>member-id</i>> <psu <i>psu-slot-number</i>> <routing-engine <i>re-slot-number</i>></pre>
Syntax (EX Series Switches except EX8200)	<pre>show chassis environment <all-members> <fpc <i>fpc-slot-number</i>> <local> <member <i>member-id</i>> <power-supply-unit> <routing-engine> <satellite [<i>slot-id slot-id</i> |device-alias <i>alias-name</i>]></pre>
Syntax (QFX Series)	<pre>show chassis environment <cb <i>slot-number</i> <interconnect-device <i>name</i>>> <fpc <i>slot-number</i> <interconnect-device <i>name</i>>> <interconnect-device <i>name</i> <slot-number> <node-device <i>name</i>> <pem <i>slot-number</i> (interconnect-device <i>name slot-number</i>) | (node-device <i>name</i>)> <routing-engine <i>name</i> <interconnect-device <i>name slot-number</i>>></pre>
Syntax (OCX Series)	<pre>show chassis environment</pre>
Syntax (PTX Series Packet Transport Routers)	<pre>show chassis environment <cb <i>cb-slot-number</i>> <ccg <i>ccg-slot-number</i>> <fpc <i>fpc-slot-number</i>> <fpm> <monitored> <pdu <i>pdu-slot-number</i>> <routing-engine <i>re-slot-number</i>> <sib <i>sib-slot-number</i>></pre>

Syntax (ACX Series Universal Access Routers)	<pre>show chassis environment <cb <i>cb-slot-number</i>> <pem <i>pem-slot-number</i>> <routing-engine <i>re-slot-number</i>></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>sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p> <p>Command introduced in Junos OS Release 11.1 for QFX Series.</p> <p>Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers.</p> <p>monitored option added 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 12.2 for ACX Series Universal Access Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.</p> <p>pem option introduced in Junos OS Release 12.3 for ACX4000 Universal Access Routers.</p> <p>Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.</p> <p>all-members, local, and member <i>member-id</i> options introduced in Junos OS Release 15.1 for MX2020 and MX2010 routers.</p> <p>satellite option introduced in Junos OS Release 14.2R3.</p>
Description	<p>Display environmental information about the router or switch chassis, including the temperature and information about the fans, power supplies, and Routing Engine.</p> <p>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.</p> <p>Starting with Junos OS Release 14.1, the show chassis environment <i>cb cb-slot-number</i> | <i>ccg ccg-slot-number</i> | <i>fpc fpc-slot-number</i> | <i>fpm</i> | <i>monitored</i> | <i>pdu pdu-slot-number</i> | <i>routing-engine re-slot-number</i> | <i>sib sib-slot-number</i> 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.</p>
Options	<p>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.</p> <p>all-members—(MX Series routers and EX Series switches only) (Optional) Display chassis environmental information for all the members of the Virtual Chassis configuration.</p> <p>adc <i>adc-slot-number</i>—(MX2020 and MX2010 routers only) (Optional) Display chassis environmental information for the adapter cards. For MX2020 routers, replace <i>adc-slot-number</i> with a value from 0 through 19. For MX2010 routers, replace <i>adc-slot-number</i> with a value from 0 through 9.</p>

cb *cb-slot-number*—(ACX Series Universal Access Routers, EX Series switches, M120, M320, and M40e routers, MX Series routers, MX2020 routers, MX2010 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**. For the EX Series switches, see *EX Series Switches Hardware and CLI Terminology Mapping* for information on CB slot numbering.

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*—(MX2020 and MX2010 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, 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 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 *EX Series Switches Hardware and CLI Terminology Mapping* 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, 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 Access 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*—(MX2020 and MX2010 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 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. See *EX Series Switches Hardware and CLI Terminology Mapping* for detailed information.

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 [**slot-id** *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****—**(MX2020 and MX2010 routers only) (Optional) Display chassis environmental information for the power supply module. 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

- [show chassis environment adc on page 879](#)
- [show chassis environment cb on page 890](#)
- [show chassis environment ccg on page 908](#)
- [show chassis environment cip](#)
- [show chassis environment fpc on page 910](#)
- [show chassis environment fpm on page 937](#)
- [show chassis environment lcc](#)
- [show chassis environment mcs on page 959](#)
- [show chassis environment monitored on page 944](#)
- [show chassis environment pcg on page 976](#)
- [show chassis environment pdu on page 978](#)
- [show chassis environment pem on page 982](#)
- [show chassis environment psm on page 993](#)
- [show chassis environment psu on page 991](#)
- [show chassis environment routing-engine on page 998](#)
- [show chassis environment scg on page 1003](#)

- [show chassis environment sfb](#) on page 1008
- [show chassis environment sib](#) on page 1022
- [show chassis environment sfc](#)

List of Sample Output	show chassis environment (M5 Router) on page 823 show chassis environment (M7i Router) on page 823 show chassis environment (M10 Router) on page 824 show chassis environment (M10i Router) on page 824 show chassis environment (M20 Router) on page 824 show chassis environment (M40 Router) on page 825 show chassis environment (M40e Router) on page 825 show chassis environment (M120 Router) on page 826 show chassis environment (M160 Router) on page 827 show chassis environment (M320 Router) on page 827 show chassis environment (MX104 Router) on page 828 show chassis environment (MX240 Router) on page 828 show chassis environment (MX240 Router with SCBE) on page 829 show chassis environment (MX480 Router) on page 830 show chassis environment (MX480 Router with SCBE) on page 831 show chassis environment (MX960 Router) on page 832 show chassis environment (MX960 Router with SCBE) on page 833 show chassis environment (MX960 Router with MPC5EQ) on page 835 show chassis environment (MX2020 Router) on page 840 show chassis environment (MX2020 Router with MPC5EQ and MPC6E) on page 849 show chassis environment (MX2010 Router) on page 853 show chassis environment (T320 Router) on page 858 show chassis environment (T640 Router) on page 859 show chassis environment (T4000 Router) on page 860 show chassis environment (TX Matrix Router) on page 861 show chassis environment (T1600 Router) on page 863 show chassis environment (TX Matrix Plus Router) on page 864 show chassis environment (TX Matrix Plus router with 3D SIBs) on page 866 show chassis environment (EX4200 Standalone Switch) on page 869 show chassis environment (EX8216 Switch) on page 869 show chassis environment (EX9200 Switch) on page 870 show chassis environment (QFX Series and OCX Series) on page 871 show chassis environment interconnect-device (QFabric System) on page 871 show chassis environment node-device (QFabric System) on page 873 show chassis environment pem node-device (QFabric System) on page 873 show chassis environment (PTX5000 Packet Transport Router) on page 873 show chassis environment (PTX5000 Packet Transport Router with FPC2-PTX-PIA) on page 876 show chassis environment (PTX1000 Packet Transport Router) on page 876 show chassis environment (ACX2000 Universal Access Router) on page 877 show chassis environment (ACX4000 Universal Access Router) on page 877
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Output Fields [Table 55](#) on page 822 lists the output fields for the **show chassis environment** command. Output fields are listed in the approximate order in which they appear.

Table 55: show chassis environment Output Fields

Field Name	Field Description
Class	<p>Information about the category or class of chassis component:</p> <ul style="list-style-type: none"> • Power: Power information: <ul style="list-style-type: none"> • (M5, M10, M20, and M40 routers and EX Series switches only) Power supply status: OK, Testing, (during initial power-on), Failed, or Absent. • (M7i, M10i, M40e, M120, M160, M320, and T Series routers and EX Series switches only) Power Entry Modules status: OK, Testing, (during initial power-on), Check, Failed, or Absent. • (PTX Series only) Power information is reported in PDU or PSM combinations. The status is: OK, Testing, (during initial power-on), Check, Failed, or Absent. • Temp: Temperature of air flowing through the chassis in degrees Celsius (C) and Fahrenheit (F). <ul style="list-style-type: none"> • On PTX Series Packet Transport Routers and MX2010 and MX2020 Routers, multiple cooling zones are supported. FRU temperatures in each zone are coordinated with the fan speed of fan trays in those zones. • EX2200 switches have a side-to-rear cooling system. The Local Intake temperature is measured by the sensor on the right side of the chassis, and the Remote Intake temperature is measured by the sensor on the left side of the chassis. • Pic: On ACX4000 Routers, multiple temperature channels on a MIC. The status is: OK and the Measurement is in degrees Celsius (C) and Fahrenheit (F). • Fan: Fan status: OK, Testing (during initial power-on), Failed, or Absent. On PTX Series Packet Transport Routers and MX2010 and MX2020 Routers, multiple fan trays are supported. Fan status is reported in Fan Tray or Fan combinations. Measurement indicates actual fan RPM (PTX and MX2010 and MX2020 Routers only). • Misc: Information about other components of the chassis. <ul style="list-style-type: none"> • On some routers, this field indicates the status of one or more additional components. • On the M40e, M160, and M320 router, Misc includes CIP (Connector Interface Panel). OK indicates that the CIP is present. Absent indicates that the CIP is not present. • On T Series routers, Misc includes CIP and SPMB (Switch Processor Mezzanine Board). OK indicates that the CIP or SPMB is present. Absent indicates that the CIP or SPMB is not present. • On PTX Series Packet Transport Routers, Misc includes the SPMB (Switch Processor Mezzanine Board). The SPMB is located on the control boards. OK indicates that the control board is present. Absent indicates that the control board is not present.
Item	<p>(MX2010 and MX2020 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 55: show chassis environment Output Fields (*continued*)

Field Name	Field Description
Status	<p>(MX104, MX2010, and MX2020 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"> • OK: The fans are operational. • Testing: The fans are being tested during initial power-on. • Failed: The fans have failed or the fans are not spinning. • Absent: The fan tray is not installed. <p>If the Class is Power, the power supply status can be:</p> <ul style="list-style-type: none"> • OK: The power component is operational. • Testing: The power component is being tested during initial power-on. • Check: There is insufficient power---that is, fewer than the minimum required feeds are connected. • Failed: The inputs leads have failed. • Absent: The power component is not installed.
Measurement	<p>(MX104, MX2010, and MX2020 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
Fans	Routing Engine 0	OK	26 degrees C / 78 degrees F
	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
			Absent
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> 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 (MX104 Router)

```
user@host> 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
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
	Fan 5	OK	Spinning at normal speed

show chassis environment (MX240 Router)

```
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 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
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 (MX480 Router with SCBE)

```
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 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)

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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

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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)

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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
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
Fans	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


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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
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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
	Fan Tray 0 Fan 2	OK	3480 RPM
	Fan Tray 0 Fan 3	OK	3480 RPM
	Fan Tray 0 Fan 4	OK	3360 RPM
	Fan Tray 0 Fan 5	OK	3360 RPM
	Fan Tray 0 Fan 6	OK	3480 RPM
	Fan Tray 1 Fan 1	OK	3360 RPM
	Fan Tray 1 Fan 2	OK	3360 RPM
	Fan Tray 1 Fan 3	OK	3360 RPM
	Fan Tray 1 Fan 4	OK	3480 RPM
	Fan Tray 1 Fan 5	OK	3480 RPM
	Fan Tray 1 Fan 6	OK	3480 RPM
	Fan Tray 2 Fan 1	OK	3360 RPM
	Fan Tray 2 Fan 2	OK	3360 RPM
	Fan Tray 2 Fan 3	OK	3480 RPM
	Fan Tray 2 Fan 4	OK	3480 RPM
	Fan Tray 2 Fan 5	OK	3360 RPM
	Fan Tray 2 Fan 6	OK	3480 RPM
	Fan Tray 3 Fan 1	OK	3360 RPM
	Fan Tray 3 Fan 2	OK	3360 RPM
	Fan Tray 3 Fan 3	OK	3480 RPM
	Fan Tray 3 Fan 4	OK	3480 RPM
	Fan Tray 3 Fan 5	OK	3480 RPM
	Fan Tray 3 Fan 6	OK	3360 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 Middle 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 (T640 Router)

```
user@host> show chassis environment
```

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
Misc	Rear Tray Bottom fan	OK	Spinning at high speed
	CIP	OK	
	SPMB 0	OK	
	SPMB 1	OK	

show chassis environment (TX Matrix Router)

```
user@host> show chassis environment
scc-re0:
```

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
	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
	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

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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:
```

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-----
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
      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)

```
user@host> show chassis environment
sfc0-re0:
```

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	

```
lcc0-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
sfc0-re0:
```

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	

lcc0-re0:

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
Misc	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
	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
	SIB 6 Exhaust	OK	38 degrees C / 100 degrees F
Fans	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 (QFX Series and OCX Series)

```

user@switch> show chassis environment
Class Item                Status      Measurement
Power FPC 0 Power Supply 0 OK
      FPC 0 Power Supply 1 OK
Temp  FPC 0 Sensor TopLeft I OK          26 degrees C / 78 degrees F
      FPC 0 Sensor TopRight I OK          24 degrees C / 75 degrees F
      FPC 0 Sensor TopLeft E OK          30 degrees C / 86 degrees F
      FPC 0 Sensor TopRight E OK          30 degrees C / 86 degrees F
      FPC 0 Sensor TopMiddle I OK          30 degrees C / 86 degrees F
      FPC 0 Sensor TopMiddle E OK          38 degrees C / 100 degrees F
      FPC 0 Sensor Bottom I OK          34 degrees C / 93 degrees F
      FPC 0 Sensor Bottom E OK          38 degrees C / 100 degrees F
      FPC 0 Sensor Die Temp OK          38 degrees C / 100 degrees F
      FPC 0 Sensor Mgmt Brd I OK          24 degrees C / 75 degrees F
      FPC 0 Sensor Switch I OK          28 degrees C / 82 degrees F
Fans  FPC 0 Fan 1 (left)   Failed
      FPC 0 Fan 2 (right) OK          Spinning at normal speed
      FPC 0 Fan 3 (middle) OK          Spinning at normal speed

```

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 (ACX2000 Universal Access 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 Access 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 adc

Syntax	show chassis environment adc <adc-slot-number> <all-members> <local> <member member-id>
Release Information	Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers. all-members , local , and member member-id options introduced in Junos OS Release 15.1 for MX2020 and MX2010 routers.
Description	Display chassis environmental information about the adapter cards.
Options	<p>none—Display environmental information about all adapter cards.</p> <p>adc-slot-number—(Optional) Display environmental information about the specified adapter card. For MX2020 routers, replace adc-slot-number with a value of 0 through 19. For MX2010 routers, replace adc-slot-number with a value of 0 through 9.</p> <p>all-members—(Optional) Display chassis environmental information about the adapter cards (ADCs) in all members of the Virtual Chassis configuration.</p> <p>local—(Optional) Display chassis environmental information about the ADCs in the local member of the Virtual Chassis.</p> <p>member member-id—(Optional) Display chassis environmental information about the ADCs in the specified member of the Virtual Chassis. Replace member-id with the value 0 or 1.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show chassis adc on page 776
List of Sample Output	show chassis environment adc (MX2020 Router) on page 880 show chassis environment adc (MX2010 Router) on page 886
Output Fields	Table 56 on page 879 lists the output fields for the show chassis environment adc command. Output fields are listed in the approximate order in which they appear.

Table 56: show chassis environment adc Output Fields

Field Name	Field Description
State	Status of the adapter card. <ul style="list-style-type: none"> • Online—The adapter card is online and running. • Offline—Adapter card is powered down.

Table 56: show chassis environment adc Output Fields (*continued*)

Field Name	Field Description
Temperature	<p>Temperature in Celsius (C) and Fahrenheit (F) of the air flowing past the adapter card.</p> <ul style="list-style-type: none"> • Intake Temperature—Measures the temperature of the air intake. • Exhaust Temperature—Measures the temperature of the hot air exhaust. • ADC-XF1—Measures the temperature of the ADC chipset, ADC-XF1. • ADC-XF0—Measures the temperature of the ADC chipset, ADC-XF0.
Power	<p>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.</p>

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                               Online
Intake Temperature                  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	Online
Intake Temperature	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	Online
Intake Temperature	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	Online
Intake Temperature	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
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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
  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

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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
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


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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

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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

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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

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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

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        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 cb

List of Syntax	Syntax on page 890 Syntax (TX Matrix Routers) on page 890 Syntax (TX Matrix Plus Routers) on page 890 Syntax (MX Series Routers) on page 890 Syntax (MX104 3D Universal Edge Routers) on page 890 Syntax (MX2010 and MX2020 3D Universal Edge Routers) on page 890 Syntax (QFabric System) on page 890
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 3D Universal Edge Routers)	show chassis environment cb
Syntax (MX2010 and MX2020 3D Universal Edge Routers)	show chassis environment cb <slot>
Syntax (QFabric System)	show chassis environment cb <slot interconnect-device <i>interconnect-device-name</i> > < interconnect-device <i>interconnect-device-name</i> 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. sfc 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 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers. Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.

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 711](#)
 - [Understanding Switching Control Board Redundancy](#)

- List of Sample Output**
- [show chassis environment cb \(M120 Router\) on page 893](#)
 - [show chassis environment cb \(M320 Router\) on page 893](#)
 - [show chassis environment cb \(MX80 Router\) on page 894](#)
 - [show chassis environment cb \(MX104 Router\) on page 894](#)
 - [show chassis environment cb \(MX240 Router\) on page 895](#)
 - [show chassis environment cb \(MX240 Router with Enhanced MX SCB\) on page 895](#)
 - [show chassis environment cb \(MX480 Router\) on page 895](#)
 - [show chassis environment cb \(MX480 Router with Enhanced MX SCB\) on page 896](#)
 - [show chassis environment cb \(MX960 Router\) on page 896](#)
 - [show chassis environment cb \(MX960 Router with Enhanced MX SCB\) on page 897](#)
 - [show chassis environment cb \(MX2020 Router\) on page 897](#)
 - [show chassis environment cb \(MX2010 Router\) on page 898](#)
 - [show chassis environment cb \(T4000 Core Router\) on page 899](#)
 - [show chassis environment cb \(TX Matrix Router\) on page 899](#)
 - [show chassis environment cb \(TX Matrix Plus Router\) on page 900](#)
 - [show chassis environment cb \(EX8200 Switch\) on page 904](#)
 - [show chassis environment cb \(EX8208 Switch\) on page 905](#)
 - [show chassis environment cb \(PTX5000 Packet Transport Router\) on page 906](#)
 - [show chassis environment cb \(QFabric System\) on page 907](#)

- Output Fields** [Table 57 on page 892](#) lists the output fields for the **show chassis environment cb** command. Output fields are listed in the approximate order in which they appear.

Table 57: show chassis environment cb Output Fields

Field Name	Field Description
State	<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"> • Online—CB is online and running. • Offline—CB is powered down. <p>NOTE: On the EX8208 switch, the installation can include three CBs.</p>
Temperature	<p>Temperature in Celsius (C) and Fahrenheit (F) of the air flowing past the CB.</p> <ul style="list-style-type: none"> • Temperature Intake—Measures the temperature of the air intake to cool the power supplies. • Temperature Exhaust—Measures the temperature of the hot air exhaust. <p>NOTE: On the MX2010 and MX2020 routers, the intake temperature measures the temperature of the air intake to cool the Control Board (CB). The MX2010 and MX2020 routers include intake and exhaust temperatures for multiple zones (Intake A, Intake B, Intake C, Exhaust A, Exhaust B, and TCBC).</p>
Power	<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>
BUS Revision	<p>Revision level of the generic bus device. (Not on switches.)</p>

Table 57: show chassis environment cb Output Fields (*continued*)

Field Name	Field Description
FPGA Revision	Revision level of the field-programmable gate array (FPGA). (Not on switches.)
PMBus device (on MX240, MX480, and MX960 routers with Enhanced MX SCB)	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: <ul style="list-style-type: none"> • Expected voltage • Measured voltage • Measured current • Calculated power

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 (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

1cc1-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

1cc2-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 (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 (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	<code>show chassis environment ccg</code> <code><slot></code>
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	<p>none—Display environmental information about all CCGs on the router.</p> <p>slot —(Optional) Display environmental information about the specified CCG. Replace <i>slot</i> with 0 or 1.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> Clock Sources for PTX Series Packet Transport Routers on page 363 show chassis environment on page 815
List of Sample Output	show chassis environment ccg (PTX5000) on page 908
Output Fields	Table 58 on page 908 lists the output fields for the show chassis environment ccg command. Output fields are listed in the approximate order in which they appear.

Table 58: show chassis environment cb Output Fields

Field Name	Field Description
State	Status of the CCG: Online - Master clock , Online - Standby , or Offline . If two CCGs are installed and online, one is functioning as the master clock, and the other is the standby clock.
Temperature	Temperature of the air flowing past the CCG.
Power	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.
BUS Revision	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 fpc

List of Syntax	Syntax on page 910 Syntax (TX Matrix and TX Matrix Plus Routers) on page 910 Syntax (MX Series Routers) on page 910 Syntax (MX2010 3D Universal Edge Routers) on page 910 Syntax (MX2020 3D Universal Edge Routers) on page 910 Syntax (QFX Series) on page 910 Syntax (OCX Series) on page 910 Syntax (PTX3000 Series) on page 910
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 <i>member-id</i> >
Syntax (MX2010 3D Universal Edge Routers)	show chassis environment fpc <slot>
Syntax (MX2020 3D Universal Edge Routers)	show chassis environment fpc <slot> <satellite [slot-id <i>slot-id</i> [device-alias <i>alias-name</i>]]>
Syntax (QFX Series)	show chassis environment fpc <fpc-slot> interconnect-device <i>name</i>
Syntax (OCX Series)	show chassis environment fpc <fpc-slot>
Syntax (PTX3000 Series)	show chassis environment fpc <fpc-slot>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. 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. Command introduced in Junos OS Release 12.1 for T4000 Core Routers. Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers. Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

satellite option introduced in Junos OS Release 14.2R3.

Description (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).

Options **none**—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.

all-members—(MX Series routers only) (Optional) Display environmental information for the FPCs in all the members of the Virtual Chassis configuration.

interconnect-device *name*—(QFabric systems only) (Optional) Display chassis environmental information 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 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 [*slot-id 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.
- 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 725](#)
 - [show chassis fpc on page 1322](#)
 - [show chassis fpc-feb-connectivity on page 1365](#)
 - [Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 333](#)
 - [MX960 Flexible PIC Concentrator Description](#)

List of Sample Output

- [show chassis environment fpc \(M120 Router\) on page 914](#)
- [show chassis environment fpc \(M160 Router\) on page 915](#)
- [show chassis environment fpc \(M320 Router\) on page 916](#)
- [show chassis environment fpc \(MX2020 Router\) on page 916](#)

[show chassis environment fpc \(MX2010 Router\) on page 919](#)
[show chassis environment fpc \(MX240 Router\) on page 922](#)
[show chassis environment fpc \(MX480 Router\) on page 923](#)
[show chassis environment fpc \(MX960 Router\) on page 923](#)
[show chassis environment fpc \(MX480 Router with 100-Gigabit Ethernet CFP\) on page 924](#)
[show chassis environment fpc \(MX240, MX480, MX960 with Application Services Modular Line Card\) on page 926](#)
[show chassis environment fpc \(T320, T640, and T1600 Routers\) on page 926](#)
[show chassis environment fpc \(T4000 Router\) on page 927](#)
[show chassis environment fpc lcc \(TX Matrix Router\) on page 932](#)
[show chassis environment fpc lcc \(TX Matrix Plus Router\) on page 932](#)
[show chassis environment fpc \(QFX Series and OCX Series\) on page 933](#)
[show chassis environment fpc interconnect-device \(QFabric Systems\) on page 933](#)
[show chassis environment fpc 5 \(PTX3000 Packet Transport Router\) on page 934](#)
[show chassis environment fpc 0 \(PTX5000 Packet Transport Router\) on page 934](#)
[show chassis environment fpc 07 \(PTX5000 Packet Transport Router with FPC2-PTX-P1A\) on page 935](#)
[show chassis environment FPC 1 \(MX Routers with Media Services Blade \[MSB\]\) on page 936](#)

Output Fields Table 59 on page 913 lists the output fields for the **show chassis environment fpc** command. Output fields are listed in the approximate order in which they appear.

Table 59: show chassis environment fpc Output Fields

Field Name	Field Description
State	<p>Status of the FPC:</p> <ul style="list-style-type: none"> • Unknown—FPC is not detected by the router. • Empty—No FPC is present. • Present—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. • Ready—FPC is in intermediate or transition state. • Announce online—Intermediate state during which the FPC is coming up but not yet online, and the chassis manager acknowledges the chassisd FPC online initiative. • Online—FPC is online and running. • Offline—FPC is powered down. • Diagnostics—FPC is set to operate in diagnostics mode.
Temperature	(M40e and M160 routers and QFX Series only) Temperature of the air flowing past the FPC.
PMB Temperature	<p>(PTX Series only) Temperature of the air flowing past the PMB (bottom of the FPC).</p> <p>The PTX5000 Packet Transport Router with FPC2-PTX-P1A include multiple temperatures for PMB (TEMPO and TEMP1).</p>
PMB CPU Temperature	(PTX5000 Packet Transport Router with FPC2-PTX-P1A only) Temperature of the air flowing past the PMB CPU.

Table 59: show chassis environment fpc Output Fields (*continued*)

Field Name	Field Description
Temperature Intake	(M320 routers, MX2010 routers, MX2020 routers, and PTX Series only) Temperature of the air flowing into the chassis.
Temperature Top	(T Series routers only) Temperature of the air flowing past the top of the FPC.
Temperature Exhaust	(M120 and M320 routers, MX2010 routers, MX2020 routers, and PTX Series only) Temperature of the air flowing out of the chassis. The PTX Series Packet Transport Routers, and the MX2010 and MX2020 routers include exhaust temperatures for multiple zones (Exhaust A and Exhaust B).
Temperature Bottom	(T Series routers only) Temperature of the air flowing past the bottom of the FPC.
TL <i>n</i> Temperature	(PTX Series only) Temperature of the air flowing past the specified TL area of the packet forwarding engine (PFE) on the FPC.
TQ <i>n</i> Temperature	(PTX Series only) Temperature of the air flowing past the specified TQ area of the packet forwarding engine (PFE) on the FPC.
Temperature MMBO	(T640 router only) Temperature of the air flowing past the type 3 FPC.
Temperature MMB1	(M320 and T Series routers only) Temperature of the air flowing past the type 1, type 2, and type 3 FPC.
Power	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.
CMB Revision or BUS revision	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 TSen45 degrees C / 113 degrees F
Temperature PLX Switch Chip47 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_0V9-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 (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 (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 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 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 TEMP0 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 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 fpm

List of Syntax	Syntax on page 937 Syntax (TX Matrix Routers) on page 937 Syntax (TX Matrix Plus Routers) on page 937
Syntax	show chassis environment fpm
Syntax (TX Matrix Routers)	show chassis environment fpm <lcc <i>number</i> | scc>
Syntax (TX Matrix Plus Routers)	show chassis environment fpm <lcc <i>number</i> | sfc <i>number</i> >
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>sfc 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 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.</p>
Description	(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.
Options	<p>none—(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>lcc <i>number</i>—(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"> • 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. <p>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).</p>

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 730](#)

List of Sample Output

- [show chassis environment fpm \(M40e and M160 Routers\) on page 939](#)
- [show chassis environment fpm \(M320 Router\) on page 939](#)
- [show chassis environment fpm \(MX2010 Router\) on page 939](#)
- [show chassis environment fpm \(MX2020 Router\) on page 940](#)
- [show chassis environment fpm \(MX240 Router\) on page 940](#)
- [show chassis environment fpm \(MX480 Router\) on page 940](#)
- [show chassis environment fpm \(T Series Routers\) on page 940](#)
- [show chassis environment fpm lcc \(TX Matrix Router\) on page 940](#)
- [show chassis environment fpm scc \(TX Matrix Router\) on page 940](#)
- [show chassis environment fpm sfc \(TX Matrix Plus Router\) on page 941](#)
- [show chassis environment fpm \(T4000 Core Router\) on page 941](#)
- [show chassis environment fpm \(PTX5000 Packet Transport Router\) on page 942](#)

Output Fields [Table 60 on page 938](#) lists the output fields for the **show chassis environment fpm** command. Output fields are listed in the approximate order in which they appear.

Table 60: show chassis environment fpm Output Fields

Field Name	Field Description
State	<p>FPM status:</p> <ul style="list-style-type: none"> • Online—FPM is online and running. • Offline—FPM is powered down.
FPM CMB Voltage	(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.
FPM GBUS Voltage	(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.
FPM I2CS Voltage	(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.
FPM Display Voltage	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.
FPM CMB Temperature	(M40e and M160 routers only) Temperature of the air flowing past the FPM CMB device

Table 60: show chassis environment fpm Output Fields (*continued*)

Field Name	Field Description
FPM GBUS Temperature	(M320 and T Series routers only) Temperature of the air flowing past the FPM GBUS device.
FPM I2CS Temperature	(PTX Series only) Temperature of the air flowing past the FPM I2CS device.
FPM Display Temperature	Temperature of the air flowing past the FPM display.
CMB Revision	(M40e and M160 routers only) Revision level of the CMB device.
GBUS Revision	(M320 and T Series routers only) Revision level of the GBUS device.
I2CS Revision	(MX2010 routers, MX2020 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 (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

List of Syntax	Syntax on page 944 Syntax (MX2020 and MX2010 Routers) on page 944
Syntax	show chassis environment monitored
Syntax (MX2020 and MX2010 Routers)	show chassis environment monitored <all-members> <local> <member <i>member-id</i> >
Release Information	Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Routers. Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers. all-members , local , and member <i>member-id</i> options introduced in Junos OS Release 15.1 for MX2020 and MX2010 routers.
Description	<p>(PTX Series Packet Transport Routers, and MX2010 and MX2020 routers) Display status information for monitored temperatures.</p> <p>On the PTX Series Packet Transport Routers, and on MX2010 and MX2020 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>
Options	<p>none—Display status information for monitored temperatures.</p> <p>all-members—(MX2010 and MX2020 routers only) (Optional) Display chassis information for monitored temperatures in all members of the Virtual Chassis configuration.</p> <p>local—(MX2010 and MX2020 routers only) (Optional) Display chassis information for monitored temperatures in the local member of the Virtual Chassis.</p> <p>member <i>member-id</i>—(MX2010 and MX2020 routers only) (Optional) Display chassis information for monitored temperatures in the specified member of the Virtual Chassis. Replace <i>member-id</i> with the value 0 or 1.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• show chassis environment on page 815• <i>Chassis-Level Feature Guide</i>
List of Sample Output	show chassis environment monitored (PTX3000 Packet Transport Router) on page 945 show chassis environment monitored (PTX5000 Packet Transport Router) on page 946 show chassis environment monitored (MX2010 Router) on page 946 show chassis environment monitored (MX2020 Router) on page 949

Output Fields Table 61 on page 945 lists the output fields for the **show chassis environment monitored** command. Output fields are listed in the approximate order in which they appear.

Table 61: show chassis environment monitored Output Fields

Field Name	Field Description
Item	Chassis component: <ul style="list-style-type: none"> (PTX Series Packet Transport Routers, and MX2010 and MX2020 routers)—Information about the chassis, Routing Engines, Control Boards (CBs), Switch Interface Boards (SIBs), PICs, and Flexible PIC Concentrators (FPCs).
Status	Status of the specified item: OK , Alarm , or Present .
Measurement	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)

```
user@host > show chassis environment monitored
```

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 mcs

Syntax	<code>show chassis environment mcs</code> <code><slot></code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M40e and M160 routers only) Display environmental information about the Miscellaneous Control Subsystems (MCSs).
Options	none —Display environmental information about both MCSs. slot —(Optional) Display environmental information about an individual MCS. Replace slot with 0 or 1
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • request chassis mcs on page 734
List of Sample Output	show chassis environment mcs (M40e Router) on page 960 show chassis environment mcs (M160 Router) on page 960
Output Fields	Table 62 on page 959 lists the output fields for the show chassis environment mcs command. Output fields are listed in the approximate order in which they appear.

Table 62: show chassis environment mcs Output Fields

Field Name	Field Description
State	Status of the MCS: <ul style="list-style-type: none"> • Present—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. • Online—MCS is online and running. • Offline—MCS is powered down. • Empty—No MCS is present. • Master—MCS is online, operating as master. • Standby—MCS is online, operating as standby.
Temperature	Temperature of the air flowing past the MCS.
Power	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.
BUS Revision	Revision level of the generic bus device.
FPGA Revision	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

List of Syntax	Syntax on page 961 Syntax (MX2020 and MX2010 Routers) on page 961
Syntax	show chassis environment monitored
Syntax (MX2020 and MX2010 Routers)	show chassis environment monitored <all-members> <local> <member <i>member-id</i> >
Release Information	Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Routers. Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers. all-members , local , and member <i>member-id</i> options introduced in Junos OS Release 15.1 for MX2020 and MX2010 routers.
Description	<p>(PTX Series Packet Transport Routers, and MX2010 and MX2020 routers) Display status information for monitored temperatures.</p> <p>On the PTX Series Packet Transport Routers, and on MX2010 and MX2020 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>
Options	<p>none—Display status information for monitored temperatures.</p> <p>all-members—(MX2010 and MX2020 routers only) (Optional) Display chassis information for monitored temperatures in all members of the Virtual Chassis configuration.</p> <p>local—(MX2010 and MX2020 routers only) (Optional) Display chassis information for monitored temperatures in the local member of the Virtual Chassis.</p> <p>member <i>member-id</i>—(MX2010 and MX2020 routers only) (Optional) Display chassis information for monitored temperatures in the specified member of the Virtual Chassis. Replace <i>member-id</i> with the value 0 or 1.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show chassis environment on page 815 • <i>Chassis-Level Feature Guide</i>
List of Sample Output	show chassis environment monitored (PTX3000 Packet Transport Router) on page 962 show chassis environment monitored (PTX5000 Packet Transport Router) on page 963 show chassis environment monitored (MX2010 Router) on page 963 show chassis environment monitored (MX2020 Router) on page 966

Output Fields Table 61 on page 945 lists the output fields for the **show chassis environment monitored** command. Output fields are listed in the approximate order in which they appear.

Table 63: show chassis environment monitored Output Fields

Field Name	Field Description
Item	Chassis component: <ul style="list-style-type: none"> (PTX Series Packet Transport Routers, and MX2010 and MX2020 routers)—Information about the chassis, Routing Engines, Control Boards (CBs), Switch Interface Boards (SIBs), PICs, and Flexible PIC Concentrators (FPCs).
Status	Status of the specified item: OK , Alarm , or Present .
Measurement	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)

```
user@host > show chassis environment monitored
```

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 pcg

Syntax	<code>show chassis environment pcg</code> <code><slot></code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M40e and M160 routers only) Display environmental information about the Packet Forwarding Engine clock generators (PCGs).
Options	<p>none—Display environmental information about both PCGs.</p> <p>slot—(Optional) Display environmental information about an individual PCG. Replace slot with 0 or 1.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> request chassis pcg on page 738
List of Sample Output	show chassis environment pcg (M40e Router) on page 977 show chassis environment pcg (M160 Router) on page 977
Output Fields	Table 64 on page 976 lists the output fields for the show chassis environment pcg command. Output fields are listed in the approximate order in which they appear.

Table 64: show chassis environment pcg Output Fields

Field Name	Field Description
PCG slot status	Slot number: 0 or 1.
State	Status of PCG: <ul style="list-style-type: none"> Present—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. Online—PCG is powered down. If Online, it can be the Master clock or the Standby clock. Offline—PCG is powered down. Empty—No PCG is present.
Temperature	Temperature of the air flowing past the PCG.
Frequency	Frequency setting and measurement for the PCG.
Power	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.
BUS Revision	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

Syntax	<pre>show chassis environment pdu <none> <slot></pre>
Release Information	Command introduced in Junos OS Release 12.1X48 for PTX5000 Packet Transport Routers.
Description	<p>Display the environmental status information of a power distribution unit (PDU).</p> <p>Starting from Junos OS Release 14.1, the show chassis environment pdu slot 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>
Options	<p>none—Display environmental information about all PDUs.</p> <p>slot —(Optional) Display environmental information about an individual PDU. For the PTX5000, replace slot with 0 or 1.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • <i>PTX5000 Packet Transport Router Hardware Guide</i>
List of Sample Output	<p>show chassis environment pdu (PTX5000) on page 979</p> <p>show chassis environment pdu (PTX5000 Packet Transport Router with DC PSM and PDU) on page 980</p> <p>show chassis environment pdu (PTX5000 Packet Transport Router with AC PSM and PDU) on page 981</p>
Output Fields	<p>Table 65 on page 978 lists the output fields for the show chassis environment pdu command. Output fields are listed in the approximate order in which they appear.</p>

Table 65: 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 Online, Present, or Absent.

Table 65: show chassis environment pdu Output Fields (*continued*)

Field Name	Field Description
PDU - BoostConv	Status of the booster converter.
Feed Switch	Status of the connected input line cord in the AC PDU. Status can be 60A , 100A , or 150A .
PDU - Hours Used	Number of hours the PDU has been operational.
PDU - Firmware Version	Version level of the firmware running on the PDU.
PSM <i>number</i> status	PSM number. PSMs are numbered 0 through 3 .
PSM - State	Status of the PSM. Status can be Online , Present , or Absent .
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 - 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 pem

List of Syntax	Syntax on page 982 Syntax (ACX4000 Router) on page 982 Syntax (TX Matrix Routers) on page 982 Syntax (TX Matrix Plus Routers) on page 982 Syntax (MX Series Router) on page 982 Syntax (MX104 3D Universal Edge Routers) on page 982 Syntax (QFX Series) on page 982 Syntax (OCX Series) on page 982
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 (MX104 3D Universal Edge Routers)	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>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS 11.3 for the QFX Series. Command introduced in Junos OS 12.3R2 for EX Series. Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers. Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
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 T1600 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 and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display environmental information about the PEM in a specified T640 router (or line-card chassis) that is connected to a TX Matrix router. On a TX Matrix Plus router, display environmental information about the PEM in a specified T1600 router (or line-card chassis) that is connected to a TX Matrix Plus router. Replace ***number*** with a value from **0** through **3**.
- 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.
- 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 1368](#)

List of Sample Output

[show chassis environment pem \(M40e Router\) on page 985](#)
[show chassis environment pem \(M120 Router\) on page 985](#)
[show chassis environment pem \(M160 Router\) on page 985](#)
[show chassis environment pem \(M320 Router\) on page 986](#)
[show chassis environment pem \(MX104 Router\) on page 986](#)
[show chassis environment pem \(MX240 Router\) on page 986](#)
[show chassis environment pem \(MX480 Router\) on page 986](#)
[show chassis environment pem \(MX960 Router\) on page 987](#)
[show chassis environment pem \(T320 Router\) on page 987](#)
[show chassis environment pem \(T640 Router\) on page 987](#)
[show chassis environment pem \(T4000 Router\) on page 987](#)
[show chassis environment pem \(T640/T1600/T4000 Routers With Six-Input DC Power Supply\) on page 988](#)
[show chassis environment pem lcc \(TX Matrix Routing Matrix\) on page 988](#)
[show chassis environment pem scc \(TX Matrix Routing Matrix\) on page 988](#)
[show chassis environment pem sfc \(TX Matrix Plus Routing Matrix\) on page 989](#)
[show chassis environment pem lcc \(TX Matrix Plus Routing Matrix\) on page 989](#)
[show chassis environment pem node-device \(QFabric System\) on page 990](#)
[show chassis environment pem \(QFX Series and OCX Series\) on page 990](#)
[show chassis environment pem interconnect-device \(QFabric System\) on page 990](#)

Output Fields

Table 66 on page 984 lists the output fields for the **show chassis environment pem** command. Output fields are listed in the approximate order in which they appear.

Table 66: show chassis environment pem Output Fields

Field Name	Field Description
PEM <i>slot</i> status	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.
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.

Table 66: show chassis environment pem Output Fields (*continued*)

Field Name	Field Description
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 (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 (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 psu

Syntax	show chassis environment psu <i><slot-number></i>
Release Information	Command introduced in Junos OS Release 10.3 for EX Series switches.
Description	(On EX8200 switches only) Display the state of the power supply.
Options	<p>none—Display the state of the power supply for all power supplies.</p> <p>slot-number—(Optional) Display the state of the power supply for a specific power supply slot number (0–5).</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • <i>Verifying Power Configuration and Use</i> • <i>show chassis power-budget-statistics</i>
List of Sample Output	<p>show chassis environment psu on page 991</p> <p>show chassis environment psu (for PSU 1) on page 992</p>
Output Fields	Table 67 on page 991 lists the output fields for the show chassis environment psu command. Output fields are listed in the approximate order in which they appear.

Table 67: show chassis environment psu Output Fields

Field Name	Field Description
State	State of the power supply: Online, Offline, or Empty.
Temperature	Temperature for the online power supply: OK or Out of Range.
DC Output	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

Syntax	show chassis environment psm <all-members> <local> <member <i>member-id</i> > <psm-slot-number>
Release Information	Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers. all-members , local , and member <i>member-id</i> options introduced in Junos OS Release 15.1 for MX2020 and MX2010 routers.
Description	Display chassis environmental information about the power supply module (PSM).
Options	<p>none—Display environmental information about all power supply modules (PSMs).</p> <p>all-members—(Optional) Display chassis environmental information about the PSM in all members of the Virtual Chassis configuration.</p> <p>local—(Optional) Display chassis environmental information about the PSM in the local member of the Virtual Chassis.</p> <p>member <i>member-id</i>—(Optional) Display chassis environmental information about the PSM in the specified member of the Virtual Chassis. Replace <i>member-id</i> with the value 0 or 1.</p> <p>psm-slot-number—(Optional) Display environmental information about the specified power supply module. For MX2020 routers, replace psm-slot-number with a value from 0 through 17. For MX2010 routers, replace psm-slot-number with a value from 0 through 8.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show chassis environment on page 815
List of Sample Output	show chassis environment psm (MX2020 Router) on page 994 show chassis environment psm (MX2010 Router) on page 996
Output Fields	Table 68 on page 993 lists the output fields for the show chassis environment psm command. Output fields are listed in the approximate order in which they appear.

Table 68: show chassis environment psm Output Fields

Field Name	Field Description
State	<p>Status of the PSM.</p> <ul style="list-style-type: none"> • Online—The PSM is online and running. • Offline—PSM is powered down.

Table 68: show chassis environment psm Output Fields (*continued*)

Field Name	Field Description
Temperature	Temperature in Celsius (C) and Fahrenheit (F) of the air flowing past the PSM.
DC Input	State of the DC input power feed for the specified zone at the specified amps and voltage, and load for the PSM.
DC Output	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.
Hours Used	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 (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 routing-engine

List of Syntax	Syntax on page 998 Syntax (TX Matrix Routers) on page 998 Syntax (TX Matrix Plus Routers) on page 998 Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers) on page 998 Syntax (MX Series Routers) on page 998 Syntax (QFX Series) on page 998 Syntax (OCX Series) on page 998
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, and MX2020 3D Universal Edge Routers)	show chassis environment routing-engine <slot> <satellite [slot-id slot-id | device-alias alias-name]>
Syntax (MX Series Routers)	show chassis environment routing-engine <slot> <all-members> <local> <member member-id>
Syntax (QFX Series)	show chassis environment routing-engine interconnect-device name
Syntax (OCX Series)	show chassis environment routing-engine
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. sfc 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 12.1 for the PTX Series Packet Transport Routers. Command introduced in Junos OS Release 12.1 for the T4000 Core Routers. Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers. Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers. Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series. satellite option introduced in Junos OS Release 14.2R3.
Description	Display Routing Engine environmental status information.

Options **none**—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.

all-members—(MX Series routers only) (Optional) Display environmental information about the Routing Engines in all member routers in the Virtual Chassis configuration.

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 [*slot-id 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, 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 745](#)
- [show chassis routing-engine on page 1613](#)

List of Sample Output

- [show chassis environment routing-engine \(Nonredundant\) on page 1000](#)
- [show chassis environment routing-engine \(Redundant\) on page 1001](#)
- [show chassis environment routing-engine \(MX104 Router\) on page 1001](#)
- [show chassis environment routing-engine \(MX2010 Router\) on page 1001](#)
- [show chassis environment routing-engine \(MX2020 Router\) on page 1001](#)
- [show chassis environment routing-engine \(TX Matrix Plus Router\) on page 1001](#)
- [show chassis environment routing-engine \(T4000 Core Router\) on page 1002](#)
- [show chassis environment routing-engine \(QFX Series and OCX Series\) on page 1002](#)
- [show chassis environment routing-engine interconnect-device \(QFabric System\) on page 1002](#)
- [show chassis environment routing-engine \(PTX5000 Packet Transport Router\) on page 1002](#)

Output Fields Table 69 on page 1000 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 69: 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"> • Online Master—Routing Engine is online, operating as Master. • Online Standby—Routing Engine is online, operating as Standby. • Offline—Routing Engine is offline.
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 (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 (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 scg

List of Syntax	Syntax on page 1003 Syntax (TX Matrix and TX Matrix Plus Router) on page 1003
Syntax	show chassis environment scg <slot>
Syntax (TX Matrix and TX Matrix Plus Router)	show chassis environment scg <lcc number> <slot>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 12.1 for the T4000 Core Routers.</p>
Description	Display SONET Clock Generator (SCG) environmental information.
Options	<p>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.</p> <p>lcc number—(TX Matrix router and TX Matrix Plus router only) (Optional) Line-card chassis number. Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none"> • 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. <p>slot—(Optional) Display environmental information about the SCG. Replace slot with 0 or 1.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • request chassis scg on page 750 • <i>Configuring the Clock Source</i> • <i>T320 SONET Clock Generator (SCG) Description</i>
List of Sample Output	show chassis environment scg (T Series Routers) on page 1004

[show chassis environment scg \(T4000 Core Routers\) on page 1005](#)
[show chassis environment scg lcc \(TX Matrix Router\) on page 1005](#)
[show chassis environment scg lcc \(TX Matrix Plus Router\) on page 1005](#)
[show chassis environment scg \(TX Matrix Plus Router\) on page 1006](#)

Output Fields Table 70 on page 1004 lists the output fields for the **show chassis environment scg** command. Output fields are listed in the approximate order in which they appear.

Table 70: 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"> • Online—SCG is online and running. • Offline—SCG is powered down. 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

Syntax	<pre>show chassis environment sfb <all-members> <local> <member <i>member-id</i>> <sfb-slot-number></pre>
Release Information	<p>Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers. all-members, local, and member <i>member-id</i> options introduced in Junos OS Release 15.1 for MX2020 and MX2010 routers.</p>
Description	Display chassis environmental information about the Switch Fabric Board (SFB).
Options	<p>none—Display environmental information about all Switch Fabric Boards.</p> <p>all-members—(Optional) Display chassis environmental information about the SFB in all members of the Virtual Chassis configuration.</p> <p>local—(Optional) Display chassis environmental information about the SFB in the local member of the Virtual Chassis.</p> <p>member <i>member-id</i>—(Optional) Display chassis environmental information about the SFB in the specified member of the Virtual Chassis. Replace <i>member-id</i> with the value 0 or 1.</p> <p>sfb-slot-number—(Optional) Display environmental information about the specified Switch Fabric Board. For MX2020 and MX2010 routers, replace <i>sfb-slot-number</i> with a value from 0 through 7.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • request chassis sfb on page 752 • show chassis sfb on page 1641
List of Sample Output	<p>show chassis environment sfb (MX2020 Router) on page 1009</p> <p>show chassis environment sfb (MX2010 Router) on page 1013</p>
Output Fields	<p>Table 71 on page 1008 lists the output fields for the show chassis environment sfb command. Output fields are listed in the approximate order in which they appear.</p>

Table 71: show chassis environment sfb Output Fields

Field Name	Field Description
State	<p>Status of the SFB.</p> <ul style="list-style-type: none"> • Online—The SFB is online and running. • Offline— SFB is powered down.

Table 71: show chassis environment sfb Output Fields (*continued*)

Field Name	Field Description
Temperature	<p>Temperature in Celsius (C) and Fahrenheit (F) of the air flowing past the SFB.</p> <ul style="list-style-type: none"> • Intake—Measures the temperature of the air intake. • Exhaust—Measures the temperature of the hot air exhaust. • SFB-XF2—Measures the temperature of the hot air exhaust for the XF2 fabric plane. • SFB-XF1—Measures the temperature of the hot air exhaust for the XF1 fabric plane. • SFB-XF0—Measures the temperature of the hot air exhaust for the XF0 fabric plane.
Power	<p>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.</p>

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 sfm

Syntax	<code>show chassis environment sfm</code> <code><slot></code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M40e and M160 routers only) Display Switching and Forwarding Module (SFM) environmental information.
Options	<p>none—Display environmental information about all SFMs.</p> <p>slot—(Optional) Display environmental information about an individual SFM. Replace slot with a value from 0 through 3.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • request chassis sfm on page 754 • request chassis sfm master switch on page 753 • <i>Configuring SFM Redundancy on M40e and M160 Routers</i> • <i>Switching the Global Master and Backup Roles in a Virtual Chassis Configuration</i>
List of Sample Output	<p>show chassis environment sfm (M40e Router) on page 1020</p> <p>show chassis environment sfm (M160 Router) on page 1020</p>
Output Fields	Table 72 on page 1018 lists the output fields for the <code>show chassis environment sfm</code> command. Output fields are listed in the approximate order in which they appear.

Table 72: show chassis environment sfm Output Fields

Field Name	Field Description
SFM slot status	SFM slot number: 0 or 1 on an M40e router, or 0 , 1 , 2 , or 3 on an M160 router.
State	<p>Status of the SFM:</p> <ul style="list-style-type: none"> • Online—SFM is online and running. • Offline—SFM is powered down. <p>If two SFMs are installed and online, one is functioning as the master, and the other is marked as the Standby.</p>
SPP Temperature	Temperature of the air flowing past the Switch Plane Processor card.
SPR Temperature	Temperature of the air flowing past the Switch Plane Router card.
SPP Power	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.

Table 72: show chassis environment sfm Output Fields (*continued*)

Field Name	Field Description
SPR Power	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.
CMB Revision	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

List of Syntax	Syntax on page 1022 Syntax (TX Matrix router) on page 1022 Syntax (TX Matrix Plus Router) on page 1022
Syntax	show chassis environment sib <slot>
Syntax (TX Matrix router)	show chassis environment sib <lcc number | scc | slot>
Syntax (TX Matrix Plus Router)	show chassis environment sib <sib-slot | lcc number | sfc number | f13 sib-slot | f2s sib-slot/sib-f2s-slot-number>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>sfc 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>
Description	Display Switch Interface Board (SIB) environmental information.
Options	<p>none—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>f13 sib-slot—(TX Matrix Plus routers only) (Optional) Display SIB F13 environmental information only. Replace sib-slot with one of the following values: 0, 1, 3, 4, 6, 7, 8, 9, 11, or 12. (Slots 2, 5, 10, 13, 14, and 15 are unused).</p> <p>f2s sib-slot/sib-f2s-slot-number—(TX Matrix Plus routers only) (Optional) Display SIB F2s environmental information only. Replace sib-slot with a value from 0 through 4, followed by a sib-f2s-slot-number value of 0, 2, 4 or 6.</p> <p>lcc number—(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"> • 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 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 755](#)
- [show chassis sibs on page 1646](#)
- [Configuring the Junos OS to Upgrade and Downgrade Switch Interface Boards on a TX Matrix Router on page 222](#)
- [M320 SIB Description](#)

List of Sample Output

- [show chassis environment sib \(M320 Router\) on page 1024](#)
- [show chassis environment sib 1 \(T640 Router\) on page 1025](#)
- [show chassis environment sib 1 \(T4000 Router\) on page 1025](#)
- [show chassis environment sib scc \(TX Matrix Router\) on page 1026](#)
- [show chassis environment sib \(TX Matrix Plus Router\) on page 1027](#)
- [show chassis environment sib sfc \(TX Matrix Plus Router\) on page 1036](#)
- [show chassis environment sib f13 \(TX Matrix Plus Router\) on page 1042](#)
- [show chassis environment sib f2s \(TX Matrix Plus Router\) on page 1042](#)
- [show chassis environment sib \(TX Matrix Plus router with 3D SIBs\) on page 1043](#)
- [show chassis environment sib \(PTX5000 Packet Transport Router\) on page 1045](#)

Output Fields [Table 73 on page 1024](#) lists the output fields for the **show chassis environment sib** command. Output fields are listed in the approximate order in which they appear.

Table 73: show chassis environment sib Output Fields

Field Name	Field Description
SIB slot status	<p>SIB slot number:</p> <ul style="list-style-type: none"> • 0 through 3 on an M320 router. • 0 or 2 on a T320 router. • 0 through 4 on a T640, T1600, T4000, or TX Matrix router. • 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). • 0 through 4, followed by 0, 2, 4, or 6 for F2S SIBs on a TX Matrix Plus router. For example, SIB F2S 0/4. • 0 through 8 on a PTX5000 Packet Transport Router.
State	<p>Status of the SIB:</p> <ul style="list-style-type: none"> • Online—SIB is online and running. • Offline—SIB is powered down. • Spare (T640, T1600, T4000, and TX Matrix routers only)—SIB is redundant and will move to active state if one of the working SIBs fails. <p>Only four of the SIBs are active at any time. The fifth one is marked Spare. It is activated if there is a fault on one of the active SIBs.</p> <p>Online standby (TX Matrix Plus router only).</p>
Temperature	<p>Temperature of the air flowing past the SIB.</p> <p>On PTX Series Packet Transport Routers, separate temperatures are displayed for Intake, Exhaust, and Junction.</p>
Power	<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

lcc0-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 LDO	1782 mV
XF2 1.8 V LDO	1792 mV
XF3 1.8 V LDO	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...]

1cc2-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)

```

user@host> show chassis environment sib
SIB 0 status:
  State                Online
  Exhaust Temperature   37 degrees C / 98 degrees F
  Junction Temperature   43 degrees C / 109 degrees F
  Power
    1.0 V               1000 mV
    1.5 V               1499 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          3298 mV
SIB 1 status:
  State                Online
  Exhaust Temperature   36 degrees C / 96 degrees F
  Junction Temperature   45 degrees C / 113 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               900 mV
    2.5 V               2499 mV
    3.3 V bias          3321 mV
SIB 2 status:
  State                Online
  Exhaust Temperature   37 degrees C / 98 degrees F
  Junction Temperature   41 degrees C / 105 degrees F
  Power
    1.0 V               999 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          3339 mV
SIB 3 status:
  State                Online
  Exhaust Temperature   40 degrees C / 104 degrees F

```

Junction Temperature	45 degrees C / 113 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	2500 mV
3.3 V bias	3328 mV
SIB 4 status:	
State	Online
Exhaust Temperature	45 degrees C / 113 degrees F
Junction Temperature	57 degrees C / 134 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	3333 mV
SIB 5 status:	
State	Online
Exhaust Temperature	43 degrees C / 109 degrees F
Junction Temperature	71 degrees C / 159 degrees F
Power	
1.0 V	1000 mV
1.5 V	1499 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
SIB 6 status:	
State	Online
Exhaust Temperature	42 degrees C / 107 degrees F
Junction Temperature	66 degrees C / 150 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	899 mV
2.5 V	2500 mV
3.3 V bias	3311 mV
SIB 7 status:	
State	Online
Exhaust Temperature	42 degrees C / 107 degrees F
Junction Temperature	67 degrees C / 152 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	900 mV
2.5 V	2499 mV
3.3 V bias	3307 mV
SIB 8 status:	
State	Online
Exhaust Temperature	43 degrees C / 109 degrees F
Junction Temperature	71 degrees C / 159 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	2500 mV
3.3 V bias	3332 mV

show chassis ethernet-switch

List of Syntax	Syntax on page 1048 Syntax (EX8200 Switch) on page 1048 Syntax (T4000 Router) on page 1048 Syntax (TX Matrix Router) on page 1048 Syntax (TX Matrix Plus Router) on page 1048 Syntax (MX Series Router) on page 1048 Syntax (MX2010 and MX2020 3D Universal Edge Routers) on page 1048 Syntax (PTX Series Packet Transport Routers) on page 1048
Syntax	show chassis ethernet-switch <errors <port>>
Syntax (EX8200 Switch)	show chassis ethernet-switch <statistics <port> | switch <number>
Syntax (T4000 Router)	show chassis ethernet-switch <errors <port> | statistics <port>>
Syntax (TX Matrix Router)	show chassis ethernet-switch <errors <port> | statistics <port>> <lcc <number> | scc>
Syntax (TX Matrix Plus Router)	show chassis ethernet-switch <errors <port> | switch <number> <lcc number | sfc number> <statistics <port> | switch <number>
Syntax (MX Series Router)	show chassis ethernet-switch <all-members> <errors <port>> <local> <member member-id>
Syntax (MX2010 and MX2020 3D Universal Edge Routers)	show chassis ethernet-switch <errors <port> | statistics <port>> <old-rom-packet-count>
Syntax (PTX Series Packet Transport Routers)	show chassis ethernet-switch <errors <port>> <statistics <port>> <port-state <port>>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.4 for EX Series switches. sfc option introduced in Junos OS Release 9.6 for the TX Matrix Plus router. Command introduced in Junos OS Release 12.1x48 for PTX Series Packet Transport Routers. Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

- 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** **none**—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.
- all-members**—(MX Series routers only) (Optional) Display information about the ports on the CB Ethernet switch on all the members of the Virtual Chassis configuration.
- errors**—(Optional) Display the numbers and types of errors accumulated on all ports of the Ethernet switch.
- errors *port***—(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 ***port*** with a value from 0 through 15. On the TX Matrix Plus router and 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, and MX2010 routers, replace ***port*** with a value from 0 through 27.
- errors switch *number***—(TX Matrix Plus router only) (Optional) Display the numbers and types of errors accumulated on the specified switch. Replace ***number*** with a value from 0 through 2.
- 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, and MX2010 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

[show chassis ethernet-switch on page 1055](#)
[show chassis ethernet-switch \(MX480 Router with MPC4E\) on page 1055](#)
[show chassis ethernet-switch \(MX2010 Router\) on page 1056](#)
[show chassis ethernet-switch statistics \(MX2010 Router\) on page 1058](#)
[show chassis ethernet-switch \(MX2020 Router\) on page 1065](#)
[show chassis ethernet-switch statistics \(MX2020 Router\) on page 1067](#)
[show chassis ethernet-switch \(MX2020 Router with MPC4E\) on page 1075](#)
[show chassis ethernet-switch \(TX Matrix Router\) on page 1076](#)
[show chassis ethernet-switch errors on page 1078](#)
[show chassis ethernet-switch statistics on page 1078](#)
[show chassis ethernet-switch errors \(TX Matrix Plus Router\) on page 1079](#)
[show chassis ethernet-switch sfc errors \(TX Matrix Plus Router\) on page 1080](#)
[show chassis ethernet-switch statistics \(TX Matrix Plus Router\) on page 1081](#)
[show chassis ethernet-switch \(T4000 Router\) on page 1085](#)
[show chassis ethernet-switch errors \(T4000 Router\) on page 1086](#)
[show chassis ethernet-switch \(PTX5000 Packet Transport Router\) on page 1087](#)
[show chassis ethernet-switch statistics \(PTX5000 Packet Transport Router\) on page 1088](#)

[show chassis ethernet-switch port-state \(PTX5000 Packet Transport Router\) on page 1091](#)

Output Fields [Table 74 on page 1051](#) lists the output fields for the **show chassis ethernet-switch** command. Output fields are listed in the approximate order in which they appear.

Table 74: show chassis ethernet-switch Output Fields

Field Name	Field Description
<p>Link is good on port <i>n</i> connected to device</p> <p>or</p> <p>Link is good on Fast Ethernet port <i>n</i> connected to device</p> <p>or</p> <p>Link is good on Gigabit Ethernet port <i>n</i> connected to device</p> <p>or</p> <p>Link is down on Gigabit Ethernet port connected to device</p>	<p>Information about the link between each port on the CB's Ethernet switch and one of the following devices:</p> <ul style="list-style-type: none"> • FPC0 (Flexible PIC Concentrator 0) through FPC7 • Local controller • Routing Engine • Other Routing Engine (on a system with two Routing Engines) • SPMB (Switch Processor Mezzanine Board) • (TX Matrix router only) LCC0 (line-card chassis 0) through LCC3
Speed is	<p>Speed at which the Ethernet link is running: 10 Mb or 100 Mb. When the device is RE or Other RE on the TX Matrix router, the speed is 1000 Mb.</p> <p>NOTE: Irrespective of the device, the speed is 1000 Mb on the MX2010 and MX2020 routers.</p>
Duplex is	Duplex type of the Ethernet link: full or half .
Autonegotiate is Enabled (or Disabled)	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 no-concatenate statement at the [edit chassis] hierarchy level, as described in the <i>Junos OS System Basics Configuration Guide</i>).
Flow Control TX is Enabled (or Disabled)	(MX2010 routers, MX2020 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.
Flow Control RX is Enabled (or Disabled)	(MX2010 routers, MX2020 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.
MLT3	Number of multilevel threshold-3 (MLT-3) Fast Ethernet errors detected.
Accumulated error counts for port <i>n</i> connected to device FPC<i>n</i>: (error output only)	
Lock	Number of lock errors detected.
Xmit	Number of transmission errors detected.

Table 74: show chassis ethernet-switch Output Fields (*continued*)

Field Name	Field Description
ESD	Number of electrostatic discharge (ESD) errors detected.
False Carrier	Number of false carrier errors detected. This number is increased by one if a FRU is removed.
Disconnects	Number of disconnect errors detected.
FX mode	Number of errors detected on an Ethernet link over optical fiber.
Statistics for port <i>n</i> connected to device FPC<i>n</i> (statistics output only)	
TX Packets 64 Octets	(MX2010 and MX2020 routers) Number of packets of size 64 octets transmitted.
TX Packets 65 - 127 Octets	(MX2010 and MX2020 routers) Number of packets of size 65 through 127 octets transmitted.
TX Packets 128 - 255 Octets	(MX2010 and MX2020 routers) Number of packets of size 128 through 255 octets transmitted.
TX Packets 256 - 511 Octets	(MX2010 and MX2020 routers) Number of packets of size 256 through 511 octets transmitted.
TX Packets 512 - 1023 Octets	(MX2010 and MX2020 routers) Number of packets of size 512 through 1023 octets transmitted.
TX Packets 1024 - 1518 Octets	(MX2010 and MX2020 routers) Number of packets of size 1024 through 1518 octets transmitted.
TX Packets 1519 - 2047 Octets	(MX2010 and MX2020 routers) Number of packets of size 1519 through 2047 octets transmitted.
TX Packets 2048 - 4095 Octets	(MX2010 and MX2020 routers) Number of packets of size 2048 through 4095 octets transmitted.
TX Packets 4096 - 9216 Octets	(MX2010 and MX2020 routers) Number of packets of size 4096 through 9216 octets transmitted.
TX 1519 - 1522 Good Vlan frms	(MX2010 and MX2020 routers) Number of transmitted frames of size 1519 through 1522 octets that are good VLAN frames.
TX Octets	Number of octets sent.
TX Unicast packets	Number of unicast packets sent.
TX Multicast packets	Number of multicast packets sent.
TX Broadcast packets	Number of broadcast packets sent.
TX Single Collision frames	(MX2010 and MX2020 routers) Number of packets sent after one collision.

Table 74: show chassis ethernet-switch Output Fields (*continued*)

Field Name	Field Description
TX Mult. Collision frames	(MX2010 and MX2020 routers) Number of packets sent after multiple collisions.
TX Late collisions	Number of packets aborted during sending because of collisions after 64 bytes.
TX Excessive collisions	Number of packets not sent because of too many collisions.
TX Dropped packets	Number of transmitted packets that were dropped.
TX PAUSEMAC Ctrl Frames	Number of Media Access Control (MAC) frames containing PAUSE commands that were sent.
TX Oversize Packets	Number of oversize packets that were sent.
TX FCS Error Counter	Number of packets discarded because of frame check sequence errors.
TX Fragment Counter	Number of fragmented packets sent.
TX Byte Counter	Number of bytes sent.
TX Packet OK Counter	Number of viable packets sent.
TX Pause Packet Counter	Number of PAUSE packets sent.
RX Packets 64 Octets	(MX2010 and MX2020 routers) Number of packets of size 64 octets received.
RX Packets 65 - 127 Octets	(MX2010 and MX2020 routers) Number of packets of size 65 through 127 octets received.
RX Packets 128 - 255 Octets	(MX2010 and MX2020 routers) Number of packets of size 128 through 255 octets received.
RX Packets 256 - 511 Octets	(MX2010 and MX2020 routers) Number of packets of size 256 through 511 octets received.
RX Packets 512 - 1023 Octets	(MX2010 and MX2020 routers) Number of packets of size 512 through 1023 octets received.
RX Packets 1024 - 1518 Octets	(MX2010 and MX2020 routers) Number of packets of size 1024 through 1518 octets received.
RX Packets 1519 - 2047 Octets	(MX2010 and MX2020 routers) Number of packets of size 1519 through 2047 octets received.
RX Packets 2048 - 4095 Octets	(MX2010 and MX2020 routers) Number of packets of size 2048 through 4095 octets received.

Table 74: show chassis ethernet-switch Output Fields (*continued*)

Field Name	Field Description
RX Packets 4096 - 9216 Octets	(MX2010 and MX2020 routers) Number of packets of size 4096 through 9216 octets received.
RX Octets	Number of octets received.
RX Unicast packets	Number of unicast packets received.
RX Multicast packets	Number of multicast packets received.
RX Broadcast packets	Number of broadcast packets received.
RX FCS Errors	Number of packets discarded because of frame check sequence errors.
RX Alignment Errors	Number of incomplete octets received.
RX Dropped Packets	Number of incoming packets that were dropped.
RX Fragments	Number of fragmented packets received.
RX Symbol Errors	Number of symbols received that the router did not correctly decode.
RX MAC Control	Number of Media Access Control (MAC) packets received.
RX Oversize Packets	Number of oversize packets received.
RX Undersize Packets	Number of undersize packets received.
RX Jabbers	Total number of frames received that exceed the maximum byte count and contain CRC errors .
RX Control Frame Counter	Number of control frames received.
RX Pause Frame Counter	Number of pause frames received.
RX FCS Errors	Number of packets discarded because of frame check sequence errors.
RX Fragments	Number of fragmented packets received.
RX Byte Counter	Number of bytes received.
RX Packet OK Counter	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 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 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 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            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 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	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 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	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 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	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 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            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 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             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 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 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 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	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 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              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 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	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 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	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 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              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 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 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 (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 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 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 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               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

List of Syntax	Syntax on page 1092 Syntax (ACX4000 Series Router) on page 1092 Syntax (MX Series Router) on page 1092 Syntax (T Series Routers) on page 1092 Syntax (MX104, MX2010, and MX2020 3D Universal Edge Router) on page 1092 Syntax (QFX Series) on page 1092 Syntax (OCX Series) on page 1092 Syntax (TX Matrix Router) on page 1092 Syntax (TX Matrix Plus Router) on page 1092
Syntax	show chassis fan
Syntax (ACX4000 Series Router)	show chassis fan
Syntax (MX Series Router)	show chassis fan <all-members> <local> <member <i>member-id</i> >
Syntax (T Series Routers)	show chassis fan
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Router)	show chassis fan <satellite [<i>slot-id slot-id</i> | <i>device-alias alias-name</i>]>
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> | <i>scc</i> >
Syntax (TX Matrix Plus Router)	show chassis fan <lcc <i>number</i> | <i>sfc number</i> >
Release Information	Command introduced in Junos OS Release 10.0 on MX Series 3D Universal Edge Routers, M120 routers, and M320 routers, T320 routers, T640 routers, T1600 routers, TX Matrix Routers, and TX Matrix Plus routers. Command introduced in Junos OS Release 11.1 for the QFX Series. Command introduced in Junos OS Release 11.4 for EX Series switches. Command introduced in Junos OS Release 12.3 for PTX5000 Packet Transport Routers. Command introduced in Junos OS Release 12.1 for T4000 routers. Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for ACX Series Routers.

Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.
 Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
satellite option introduced in Junos OS Release 14.2R3.

- Description** (T Series routers, TX Matrix routers, TX Matrix Plus routers, M120 routers, M320 routers, MX104 routers, MX2010 routers, MX2020 routers, MX Series 3D Universal Edge Routers, 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.
- Options**
- all-members**—(MX Series routers only) (Optional) Display information about the fan tray and fans for all members of the Virtual Chassis configuration.
 - local**—(MX Series routers only) (Optional) Display information about the fan tray and fans for the local Virtual Chassis member.
 - 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

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[show chassis fan \(QFabric Systems\) on page 1095](#)
[show chassis fan \(EX Series Switches\) on page 1097](#)
[show chassis fan \(T320 Router\) on page 1097](#)
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[show chassis fan \(QFX5100 Switch and OCX Series\) on page 1104](#)

Output Fields Table 75 on page 1094 lists the output fields for the **show chassis fan** command. Output fields are listed in the approximate order in which they appear.

Table 75: show chassis fan Output Fields

Field Name	Field Description
Item	Fan item identifier.
Status	Status of the fan: <ul style="list-style-type: none"> • OK—Fan is running properly and within the normal range. • Check—Fan is in Check state because of some fault or alarm condition.
RPM	(T Series routers, TX Matrix routers, TX Matrix Plus routers, MX Series 3D Universal Edge Routers, QFX3108 Interconnect devices, and EX Series switches only) Fan speed in revolutions per minute (RPM).
% RPM	(MX2010 routers, MX2020 routers, and PTX Series Packet Transport Routers only) Percentage of the fan speed being used.

Table 75: show chassis fan Output Fields (*continued*)

Field Name	Field Description
Measurement	<p>(T Series routers, TX Matrix routers, TX Matrix Plus routers, MX Series 3D Universal Edge Routers, QFX3108 Interconnect devices, and EX Series switches only) Fan speed status based on different chassis cooling requirements:</p> <ul style="list-style-type: none"> • Spinning at high speed • Spinning at intermediate speed • Spinning at normal speed • Spinning at low speed (except EX Series switches) <p>(MX2010 routers, MX2020 routers, and PTX Series Packet Transport Routers only) Fan speed in revolutions per minute (RPM) for each fan in the fan tray.</p>

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

```
1cc2-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> 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	

1cc0-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

1cc2-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 (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 > 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 (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 (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 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.
Description	Display the current state of reachability between the Packet Forwarding Engines in the system.
Additional Information	
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show chassis fabric errors on page 1120 • show chassis fabric reachability on page 1231 • degraded on page 550
List of Sample Output	show chassis fabric degraded-fabric-reachability on page 1106
Output Fields	Table 76 on page 1106 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 76: 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

List of Syntax	Syntax on page 1108 Syntax (MX240, MX480, MX960 , MX2010 and MX2020 3D Universal Edge Routers) on page 1108
Syntax	show chassis fabric destinations
Syntax (MX240, MX480, MX960 , MX2010 and MX2020 3D Universal Edge Routers)	show chassis fabric destinations fpc < <i>fpc-slot-number</i> >
Release Information	Command introduced in Junos OS Release 12.1 for MX240, MX480, and MX960 routers. Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Description	Display the state of fabric destinations for all FPCs.
Options	none —Display information about the fabric destinations of all FPCs. fpc-slot-number —(Optional) Display information about the specified FPC. For MX2020 routers, replace fpc-slot-number with a value from 0 through 19. For MX2010 routers, replace fpc-slot-number with a value from 0 through 9.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• show chassis fabric redundancy-mode on page 1230• Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 413• Corrective Actions for Fabric Failures on MX Series Routers on page 406• Fabric Management on MPC4E Overview on page 22
List of Sample Output	show chassis fabric destinations fpc 1 (MX240 Router) on page 1109 show chassis fabric destinations fpc 2 (MX480 Router) on page 1110 show chassis fabric destinations fpc 4 (MX480 Router with MPC4E) on page 1110 show chassis fabric destinations (MX960 Router) on page 1111 show chassis fabric destinations fpc 1 (MX2020 Router) on page 1112 show chassis fabric destinations fpc 14 (MX2020 Router with MPC4E) on page 1113 show chassis fabric destinations (MX2010 Router) on page 1114
Output Fields	Table 77 on page 1109 lists the output fields for the show chassis fabric destinations command. Output fields are listed in the approximate order in which they appear.

Table 77: 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"> • 0—Destination is non-existent. • 2—Destination is enabled. • 3—Destination is disabled. • 6—Destination is in erroneous state and is disabled.
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 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 2222
Plane 7  2222 2222 2222  2222 2222 2222  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  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 2222
Plane 6  2222 2222 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  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  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 2222
Plane 2  2222 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 2222
Plane 4  2222 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 2222
Plane 6  2222 2222 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  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  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 2222
Plane 2  2222 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 2222
Plane 4  2222 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 2222
Plane 6  2222 2222 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  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 2200 2000 0000 0000 0000
2200 0000 0000 0000 0000 2222
```

```
Plane 1  2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
2200 0000 0000 0000 0000 2222
```

```
Plane 2  2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
2200 0000 0000 0000 0000 2222
```

```
Plane 3  2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
2200 0000 0000 0000 0000 2222
```

```
Plane 4  2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
```

```

2200 0000 0000 0000 0000 2222
Plane 5 2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
2200 0000 0000 0000 0000 2222
Plane 6 2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
2200 0000 0000 0000 0000 2222
Plane 7 2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
2200 0000 0000 0000 0000 2222
PFE 1
Plane 0 2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
2200 0000 0000 0000 0000 2222
Plane 1 2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
2200 0000 0000 0000 0000 2222
Plane 2 2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
2200 0000 0000 0000 0000 2222
Plane 3 2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
2200 0000 0000 0000 0000 2222
Plane 4 2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
2200 0000 0000 0000 0000 2222
Plane 5 2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
2200 0000 0000 0000 0000 2222
Plane 6 2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
2200 0000 0000 0000 0000 2222
Plane 7 2200 0000 0000 0000 0000 0000 0000 0000 0000 0000 2200 2000 0000 0000 0000
2200 0000 0000 0000 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
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

```

```
FPC 1
```

```
PFE 0
```

```

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

```

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show chassis fabric faults recovery-actions

Syntax	show chassis fabric faults recovery-actions
Release Information	Command introduced in Junos OS Release 14.2 for TX Matrix Plus routers with 3D SIBs.
Description	Display the last 10 recovery actions related to a fabric black-hole condition.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> auto-recovery-disable on page 532
List of Sample Output	show chassis fabric faults recovery-actions on page 1118
Output Fields	Table 76 on page 1106 lists the output fields for the show chassis fabric faults recovery-actions command. Output fields are listed in the approximate order in which they appear.

Table 78: show chassis fabric faults recovery-actions Output Fields

Field Name	Field Description
Fault Name	<p>The name of fault detected. The fault name appears in a message such as:</p> <p>CLOS LINK ERROR detected on F2S or F13 slot <i>slot number</i> x <i>chip</i> <i>chip number</i> and Link Number <i>link number</i></p>
Recovery Start Time	The time when recovery actions were initiated.
Recovery Action	<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"> • SFC SIB Reboot: The SFC SIB was rebooted. • LCC SIB Reboot: The LCC SIB was rebooted. • FPC Reboot: The FPC was rebooted. • Destination Reprogramming: Reenabling the data flow between Packet Forwarding Engines. • Interchassis Link Retraining: Retraining of optical links between an LCC SIB and an SFC SIB.

Sample Output

show chassis fabric faults recovery-actions

```

user@host> show chassis fabric faults recovery-actions
Fault Name           :CLOS LINK ERROR on F2S1ot3Chip0LinkNum2
Recovery Start Time  :2014-03-25 19:52:50 PDT
Recovery Action      :F2S slot 3 Reboot

```

show chassis fabric feb

Syntax	show chassis fabric feb
Release Information	Command introduced in Junos OS Release 8.0.
Description	(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.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show chassis fabric feb on page 1119
Output Fields	Table 79 on page 1119 lists the output fields for the show chassis fabric feb command.

Table 79: show chassis fabric feb Output Fields

Field Name	Field Description
Fabric management FEB state	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 1120 Syntax (PTX Series Packet Transport Routers) on page 1120
Syntax	<pre>show chassis fabric errors <autoheal> <fpc slot-number lcc number> <sib (slot | f13 sib-slot | f2s sib-slot/sib-f2s-slot-number | lcc number)></pre>
Syntax (PTX Series Packet Transport Routers)	<pre>show chassis fabric errors (autoheal | fpc slot-number | sib sib-slot)</pre>
Release Information	<p>Command introduced in Junos OS Release 10.0.</p> <p>Command introduced in Junos OS Release 12.1X48 for the PTX Series Packet Transport Routers.</p>
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. (PTX5000 Packet Transport 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.
- (PTX Series Packet Transport Routers) **sib-slot**—Specify a value ranging from 0 through 8.
- **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.
- **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.
- **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 1123](#)
- [show chassis fabric errors \(F2S SIB Errors on a TX Matrix Plus Router\) on page 1123](#)
- [show chassis fabric errors \(SIB Errors Specific to an LCC Connected to a TX Matrix Plus Router\) on page 1123](#)
- [show chassis fabric errors \(FPC Errors Specific to an LCC Connected to a TX Matrix Plus Router\) on page 1124](#)
- [show chassis fabric errors \(SIB Errors Specific to an LCC Connected to a TX Matrix Plus Router with 3D SIBs\) on page 1124](#)
- [show chassis fabric errors fpc or sib \(PTX Series Packet Transport Routers\) on page 1124](#)
- [show chassis fabric errors autoheal \(PTX Series Packet Transport Routers\) on page 1124](#)
- [show chassis fabric errors autoheal \(TX Matrix Plus Router with 3D SIBs\) on page 1124](#)

Output Fields [Table 80 on page 1122](#) lists the output fields for the `show chassis fabric errors` command. Output fields are listed in the approximate order in which they appear.

Table 80: 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 80: show chassis fabric errors Output Fields (*continued*)

Field Name	Field Description
Error log of first 100 errors	Indicates the autoheal action taken on the SIB. The following actions can occur: <ul style="list-style-type: none"> • Req—A SIB autoheal request was made on a faulty SIB. • Action—Autohealing (taking the SIB offline and then online) is initiated. • 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. • Set info—Setting information to force skipping autoheal on the SIB so that no further attempts to autoheal the faulty SIB are made. • 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.
fpc slot number	(PTX5000 Packet Transport Router only)—Range is 0 through 7.
sib slot number	(PTX Series Packet Transport Routers only)—Range is 0 through 8.
lcc number	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
```

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 Cbl 4 (tx) LCC0-SIB3 Cbl 4 (rx)
2013-03-25 00:16:12 PDT           Action: Plane 3 F13 8 Cbl 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 1125 Syntax (MX Series Routers) on page 1125 Syntax (MX2010 and MX2020 3D Universal Edge Routers) on page 1125 Syntax (T4000 Core Router) on page 1125 Syntax (PTX Series Packet Transport Routers) on page 1125 Syntax (TX Matrix Plus Router) on page 1125 Syntax (QFX Series Switches) on page 1125
Syntax	show chassis fabric fpcs <lcc <i>number</i> >
Syntax (MX Series Routers)	show chassis fabric fpcs <all-members> <local> <member <i>member-id</i> >
Syntax (MX2010 and MX2020 3D Universal Edge Routers)	show chassis fabric fpcs
Syntax (T4000 Core Router)	show chassis fabric fpcs
Syntax (PTX Series Packet Transport Routers)	show chassis fabric fpcs <slot <i>fpc-slot</i> >
Syntax (TX Matrix Plus Router)	show chassis fabric fpcs <lcc <i>number</i> >
Syntax (QFX Series Switches)	show chassis fabric fpcs <slot <i>fpc-slot</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>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 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 15.1X53-D30 for QFX Series switches.</p>
Description	Display the state of the electrical switch fabric links between the Flexible PIC Concentrators (FPCs) and the Switch Interface Boards (SIBs).
Options	<p>none—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>

all-members—(MX Series routers only) (Optional) Display the switching fabric link states for the FPCs in all members of the Virtual Chassis configuration.

lcc *number*—(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 *number* with a following value depending on the LCC configurations:

- From **0** through **3** on a T640 router on the routing matrix with TX Matrix routers.
- From **0** through **3** on a T1600 router on the routing matrix with TX Matrix Plus routers.
- From **0** through **7** on a T1600 router in a routing matrix with TX Matrix Plus router with 3D SIBs.
- **0, 2, 4, 6** on a T4000 router in a routing matrix with TX Matrix Plus router with 3D SIBs.

local—(MX Series routers only) (Optional) Display the switching fabric link states for the FPCs in the local Virtual Chassis member.

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 1322](#)
- *Displaying Information About DPCs or FPCs in an MX Series Router*

List of Sample Output

[show chassis fabric fpcs \(M320 Router\) on page 1128](#)
[show chassis fabric fpcs \(MX240 Router\) on page 1129](#)
[show chassis fabric fpcs \(MX480 Router\) on page 1129](#)
[show chassis fabric fpcs \(MX960 Router\) on page 1130](#)
[show chassis fabric fpcs \(MX240 with AS MLC Modular Carrier Card\) on page 1132](#)
[show chassis fabric fpcs \(MX480 with AS MLC Modular Carrier Card\) on page 1132](#)
[show chassis fabric fpcs \(MX480 Router with MPC4E\) on page 1133](#)
[show chassis fabric fpcs \(MX960 with AS MLC Modular Carrier Card on page 1134](#)
[show chassis fabric fpcs \(MX2010 Router\) on page 1136](#)
[show chassis fabric fpcs \(MX2020 Router\) on page 1139](#)
[show chassis fabric fpcs \(MX2020 Router with MPC4E\) on page 1142](#)

[show chassis fabric fpcs \(T320 Router\) on page 1144](#)
[show chassis fabric fpcs \(T640 Router\) on page 1144](#)
[show chassis fabric fpcs \(TX Matrix Router\) on page 1144](#)
[show chassis fabric fpcs \(TX Matrix Router with 3D SIBs\) on page 1146](#)
[show chassis fabric fpcs lcc \(TX Matrix Router with 3D SIBs\) on page 1149](#)
[show chassis fabric fpcs \(T1600 Router\) on page 1149](#)
[show chassis fabric fpcs \(T4000 Core Router\) on page 1151](#)
[show chassis fabric fpcs \(TX Matrix Plus Router\) on page 1152](#)
[show chassis fabric fpcs lcc \(TX Matrix Plus Router\) on page 1160](#)
[show chassis fabric fpcs \(EX8200 Switch\) on page 1160](#)
[show chassis fabric fpcs \(PTX3000 Router\) on page 1161](#)
[show chassis fabric fpcs \(QFX10008 Switch\) on page 1162](#)

Output Fields [Table 81 on page 1128](#) lists the output fields for the **show chassis fabric fpcs** command. Output fields are listed in the approximate order in which they appear.

Table 81: show chassis fabric fpcs Output Fields

Field Name	Field Description
Fabric management FPC state	<p>Switching fabric link (link from SIB to FPC) state for each FPC:</p> <ul style="list-style-type: none"> • Unused—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. • Destination error on PFEs <i>list of PFE numbers</i>—Destination errors to the listed Packet Forwarding Engines. Indicates that the link is not carrying traffic to the listed Packet Forwarding Engines. NOTE: 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. • Links ok—Link between the spare SIB and FPC is eligible to carry traffic. • Link error—Link between the SIB and FPC has CRC errors. However, the link is still eligible to carry traffic. • Plane disabled—Fabric plane has been disabled for the following reasons: <ul style="list-style-type: none"> • Destination errors have exceeded the thresholds. • Run-time link errors have exceeded the thresholds. • Initialization time link errors detected, and link training was unsuccessful. • Plane Disabled, Links Error (PTX Series Packet Transport Routers and QFX Series switches only)—The plane is disabled because of link errors detected at the FPC RX. • Plane Disabled, Links Down (PTX Series Packet Transport Routers and QFX Series switches only)—The plane is disabled because of link errors detected at the SIB RX. • Plane enabled—Link between the active SIB and FPC is eligible to carry traffic. NOTE: 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. • Plane Enabled, Links OK (PTX Series Packet Transport Routers and QFX Series switches only)—The FPC CCL RX link is eligible to carry traffic. • Plane Enabled, Links OK (TX Matrix and TX Matrix Plus routers only)—The FPC HSL RX link is eligible to carry traffic.

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 (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 (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
```

```

lcc0-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
lcc0-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 (T1600 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
            8   9   10  11  12  13  14  15  16  17  18  19  20  21
            0   1   2   3   4   5   6   7
SIB #4
            Destination error on PFES
            8   9   10  11  12  13  14  15  16  17  18  19  20  21
            0   1   2   3   4   5   6   7

```

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

```

```

SIB #1      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
      Unused
    SIB #1
      Links ok
    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
```

1cc1-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
      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 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 (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 (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_PF0 (plane 6) Plane Enabled, Links OK
SIB3_PF1 (plane 7) Plane Enabled, Links OK
SIB4_PF0 (plane 8) Plane Enabled, Links OK
SIB4_PF1 (plane 9) Plane Enabled, Links OK
SIB5_PF0 (plane 10) Plane Enabled, Links OK
SIB5_PF1 (plane 11) Plane Enabled, Links OK
PFE #2
SIB0_PF0 (plane 0) Plane Enabled, Links OK
SIB0_PF1 (plane 1) Plane Enabled, Links OK
SIB1_PF0 (plane 2) Plane Enabled, Links OK
SIB1_PF1 (plane 3) Plane Enabled, Links OK
SIB2_PF0 (plane 4) Plane Enabled, Links OK
SIB2_PF1 (plane 5) Plane Enabled, Links OK
SIB3_PF0 (plane 6) Plane Enabled, Links OK
SIB3_PF1 (plane 7) Plane Enabled, Links OK
SIB4_PF0 (plane 8) Plane Enabled, Links OK
SIB4_PF1 (plane 9) Plane Enabled, Links OK
SIB5_PF0 (plane 10) Plane Enabled, Links OK
SIB5_PF1 (plane 11) Plane Enabled, Links OK
PFE #3
SIB0_PF0 (plane 0) Plane Enabled, Links OK
SIB0_PF1 (plane 1) Plane Enabled, Links OK
SIB1_PF0 (plane 2) Plane Enabled, Links OK
SIB1_PF1 (plane 3) Plane Enabled, Links OK
SIB2_PF0 (plane 4) Plane Enabled, Links OK
SIB2_PF1 (plane 5) Plane Enabled, Links OK
SIB3_PF0 (plane 6) Plane Enabled, Links OK
SIB3_PF1 (plane 7) Plane Enabled, Links OK
SIB4_PF0 (plane 8) Plane Enabled, Links OK
SIB4_PF1 (plane 9) Plane Enabled, Links OK
SIB5_PF0 (plane 10) Plane Enabled, Links OK
SIB5_PF1 (plane 11) Plane Enabled, Links OK

```

show chassis fabric legend

Syntax	show chassis fabric legend
Release Information	Command introduced in Junos OS Release 14.1R2.
Description	(MX Series routers only) Display the legend of fabric management states.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show chassis fabric legend on page 1164

Sample Output

show chassis fabric legend

```
user@host > show chassis fabric legend
Legend for show chassis fabric state

Unused:
  The link is not trained and is disabled.
Links ok:
  The link is in error-free condition and carries traffic
  only if it belongs to an online plane.
Link error:
  The link encounters CRC errors and carries traffic
  only if it belongs to an online plane.
Link error: (TF)
  The link encounters training error and is disabled.
Destination error:
  The FPC has reported destination errors on the link and
  the link is disabled.
Plane disabled:
  The link is disabled due to error or plane is offlined.
Plane enabled:
  The link is enabled and carries traffic.
Plane enable error:
  The link encounters ASIC error and is disabled.

Note 1: (TF)
  When present, indicates training failure.

Note 2: Plane link state
  Plane link state (show chassis fabric plane) only tracks
  whether a link is trained or not, therefore possible plane link
  states are: Unused, Links ok, Link error (for CRC or TF).

Note 3: Plane Online/Spare state
  A link may carry traffic only if it is from an online plane.
  Refer to show chassis fabric summary [extended] for
  Online/Spare plane state.
```


show chassis fabric map

List of Syntax	Syntax on page 1165 Syntax (MX Series Router) on page 1165
Syntax	<pre>show chassis fabric map plane <plane-number></pre>
Syntax (MX Series Router)	<pre>show chassis fabric map <all-members> <local> <member member-id> <plane plane-number></pre>
Release Information	<p>Command introduced in Junos OS Release 8.0.</p> <p>Command introduced in Junos OS Release 9.4 for EX Series switches.</p>
Description	<p>(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 <i>EX Series Switches Hardware and CLI Terminology Mapping</i>.</p>
Options	<p>none—Display the switching fabric map state for the M120 or MX Series router or EX8200 switch.</p> <p>all-members—(MX Series routers only) (Optional) Display the switching fabric map state for all the members of the Virtual Chassis configuration.</p> <p>local—(MX Series routers only) (Optional) Display the switching fabric map state for the local Virtual Chassis member.</p> <p>member <i>member-id</i>—(MX Series routers only) (Optional) Display the switching fabric map state for the specified member of the Virtual Chassis configuration. Replace the <i>member-id</i> with a value of 0 or 1.</p> <p>plane <i>plane-number</i>—(Optional) Display the state of the fabric link for the specified plane number.</p> <ul style="list-style-type: none"> For the M120 router, replace <i>plane-number</i> with a value from 0 through 3. For the MX480 and MX240 routers, replace <i>plane-number</i> with a value from 0 through 7. For the MX960 router, replace <i>plane-number</i> with a value from 0 through 5. For the EX8208 switch, replace <i>plane-number</i> with a value from 0 through 11. For the EX8216 switch, replace <i>plane-number</i> with a value from 0 through 7.

Required Privilege Level	view
List of Sample Output	show chassis fabric map (M120 Router) on page 1166 show chassis fabric map (MX Series Routers) on page 1166 show chassis fabric map plane 1 (EX8200 Switch) on page 1170
Output Fields	Table 82 on page 1166 lists the output fields for the show chassis fabric map command. Output fields are listed in the approximate order in which they appear.

Table 82: 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	State of the fabric link: <ul style="list-style-type: none"> • RESET—Link between SIB and FPC/DPC is powered down on purpose. This is done in all non-dual PFE based boards. • UP—Link between SIB and FPC/DPC is up and running. • DOWN—Link between SIB and FPC/DPC is powered down. • FAULT—SIB is in alarmed state where the SIB's plane is not operational for the following reasons: <ul style="list-style-type: none"> • On-board F-chip is not operational. • Fiber optic connector faults. • FPC connector faults. • SIB midplane connector faults.

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

Syntax (TX Matrix Plus Router with 3D SIBs)	<code>show chassis fabric optics</code> <code><sib-slot></code> <code><lcc number | sfc number></code> <code><brief | detail></code>
Release Information	Command introduced in Junos OS Release 13.1 for the TX Matrix Plus router with 3D SIBs.
Description	(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.
Options	<p>none—Display brief information about the optical ports on the SFC and LCCs in the routing matrix.</p> <p>sib-number—(Optional) Display information about the optical ports for the specified SIB number.</p> <p>lcc number—(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 number with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none">• From 0 through 7 on a T1600 router connected to a TX Matrix Plus router with 3D SIBs.• 0, 2, 4, or 6 on a T4000 router connected to a TX Matrix Plus router with 3D SIBs. <p>sfc number—(Optional) Display information about the optical ports for the specified SFC number. Replace number with 0.</p> <p>brief—(Optional) Display brief information about the optical ports.</p> <p>detail—(Optional) Display detailed information about the optical ports.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• <i>Overview of a Routing Matrix with a TX Matrix Plus Router</i>
List of Sample Output	show chassis fabric optics (TX Matrix Plus Router with 3D SIBs) on page 1173 show chassis fabric optics (TX Matrix Plus Router with 3D SIBs) on page 1178 show chassis fabric optics sfc (TX Matrix Plus Router with 3D SIBs) on page 1179 show chassis fabric optics lcc (TX Matrix Plus Router with 3D SIBs) on page 1181
Output Fields	Table 83 on page 1173 lists the output fields for the show chassis fabric optics command. Output fields are listed in the approximate order in which they appear.

Table 83: show chassis fabric optics Output Fields

Field Name	Field Description
Port	Indicates port number.
Cable state	<p>Indicates the cable state:</p> <ul style="list-style-type: none"> • CABLE_CONNECTED—Cable is connected properly and is in an operable state. • CABLE_LOOPBACK—A loopback cable is connected to the port. • CABLE_NOT_CONNECTED—The optical port is not connected with any cable or all the channels are powered off on the remote side. • CABLE_MIS_CONNECTED—Cable is connected to an incorrect optical port. • CABLE_CONNECTED_WITH_ERROR—Cable is connected to the optical port, but indicates a cable issue. Refer to the optical cable fault alarms to identify the cable issue. • CABLE_NOT_SUPPORTED—The connected optics module is not supported. Only optics modules having Juniper Networks part numbers are supported. • CABLE_MODULE_ABSENT—No optics module is connected. • CABLE_MODULE_FAULT—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. • CABLE_ELEC_LOOPBACK—An electrical loopback module is connected to the optics port. <p>NOTE: Only electrical loopback modules from ELPEUS are supported.</p> <ul style="list-style-type: none"> • CABLE_ERROR—Cable cannot be detected, probably because the SIB is not online yet.
Module Type	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

```

```

1cc7-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
1cc7-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

```

```

1cc0-re0:

```

```

-----
Port      Cable state      Module Type
1cc0-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

```

```

1cc4-re0:

```

```

-----
Port      Cable state      Module Type
1cc4-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
1cc7-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
1cc7-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
1cc7-sib4: SIB slot empty		

show chassis fabric plane

List of Syntax	Syntax on page 1183 Syntax (TX Matrix Plus Router) on page 1183 Syntax (MX Series Routers) on page 1183 Syntax (MX2010 and MX2020 3D Universal Edge Routers) on page 1183
Syntax	show chassis fabric plane
Syntax (TX Matrix Plus Router)	show chassis fabric plane <detail | extensive | terse> <lcc <i>number</i> | sfc <i>number</i> >
Syntax (MX Series Routers)	show chassis fabric plane <detail | extensive | terse> <all-members> <local> <member <i>member-id</i> >
Syntax (MX2010 and MX2020 3D Universal Edge Routers)	show chassis fabric plane
Release Information	Command introduced in Junos OS Release 8.0. Command introduced in Junos OS Release 9.4 for EX Series switches. detail , extensive , lcc , sfc , and terse options introduced for the TX Matrix Plus router in Junos OS Release 9.6. Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Description	(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 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 and MX2020 Routers only) (Optional) Display the state of the fabric management plane. 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 721](#)
- [show chassis fabric plane-location on page 1225](#)
- [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)

List of Sample Output

[show chassis fabric plane \(M120 Router\) on page 1191](#)
[show chassis fabric plane \(MX240 Router\) on page 1192](#)
[show chassis fabric plane \(MX480 Router\) on page 1193](#)
[show chassis fabric plane \(MX960 Router\) on page 1194](#)
[show chassis fabric plane \(MX240 with AS MLC Modular Carrier Card\) on page 1195](#)
[show chassis fabric plane \(MX480 with AS MLC Modular Carrier Card\) on page 1196](#)
[show chassis fabric plane \(MX480 Router with MPC4E\) on page 1197](#)
[show chassis fabric plane \(MX960 with AS-MLC Modular Carrier Card\) on page 1199](#)
[show chassis fabric plane \(MX2010 Router\) on page 1201](#)
[show chassis fabric plane \(MX2020 Router\) on page 1205](#)
[show chassis fabric plane \(MX2020 Router with MPC4E\) on page 1210](#)

[show chassis fabric plane \(TX Matrix Plus Router\) on page 1213](#)
[show chassis fabric plane \(TX Matrix Plus Router with 3D SIBs\) on page 1213](#)
[show chassis fabric plane detail \(TX Matrix Plus Router\) on page 1214](#)
[show chassis fabric plane extensive \(TX Matrix Plus Router \) on page 1215](#)
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[show chassis fabric plane terse \(TX Matrix Plus Router\) on page 1219](#)
[show chassis fabric plane terse \(TX Matrix Plus Router with 3D SIBs\) on page 1219](#)
[show chassis fabric plane lcc \(TX Matrix Plus Router\) on page 1220](#)
[show chassis fabric plane lcc \(TX Matrix Plus Router with 3D SIBs\) on page 1220](#)
[show chassis fabric plane sfc \(TX Matrix Plus Router\) on page 1221](#)
[show chassis fabric plane sfc \(TX Matrix Plus Router with 3D SIBs\) on page 1221](#)
[show chassis fabric plane \(T1600 Router\) on page 1221](#)
[show chassis fabric plane extensive \(T1600 Router\) on page 1221](#)
[show chassis fabric plane detail \(T1600 Router\) on page 1224](#)
[show chassis fabric plane \(EX8200 Switch\) on page 1224](#)

Output Fields Table 84 on page 1185 lists the output fields for the **show chassis fabric plane** command. Output fields are listed in the approximate order in which they appear.

Table 84: 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"> • ACTIVE—SIB is operational and running. <p>NOTE: 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"> • FAULTY— SIB is in alarmed state where the SIB's plane is not operational for the following reasons: <ul style="list-style-type: none"> • On-board fabric ASIC is not operational. • Fiber optic connector faults. • FPC connector faults. • SIB midplane connector faults. <p>(MX2010 and MX2020 Routers only) State of each plane:</p> <ul style="list-style-type: none"> • ACTIVE—SFB is operational and running. • OFFLINE— SFB is in offline. 	none
FEB	<p>(M120 routers only) FEB number and state of links to each FEB:</p> <ul style="list-style-type: none"> • Link error—Link between SIB and FPC is not operational. • Links ok—Link between SIB and FPC is active. • Unused—No FPC is present. 	none

Table 84: show chassis fabric plane Output Fields (*continued*)

Field Name	Field Description	Level of output
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
PFE	<p>(MX Series and M120 routers only) Slot number of each Packet Forwarding Engine and the state of the links to the DCP: Links ok, Link error, or Unused. Each DPC includes four Packet Forwarding Engines.</p> <ul style="list-style-type: none"> • Links ok: Link between SIB and FPC is active. • Link error: Link between SIB and FPC is not operational. • Unused: No FPC is present. <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 and MX2020 routers only) Slot number of each Packet Forwarding Engine and the state of the links to the DPC: Links ok, Link error, or Unused. Each DPC includes four Packet Forwarding Engines.</p> <ul style="list-style-type: none"> • Links ok: Link between SFB and FPC is active. • Link error: Link between SFB and FPC is not operational. • Unused: No FPC is present. 	none

Table 84: show chassis fabric plane Output Fields (*continued*)

Field Name	Field Description	Level of output
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"> • Online: Fabric plane is operational and running and links on the SIB are operational. • Offline: Fabric plane state is Offline because the plane does not have four or more F2S and one F13 online. • Empty: Fabric plane state is Empty if all SIBs in the plane are absent. • Spare: Fabric plane is redundant and can be operational if the operational fabric plane encounters an error. • Check: 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"> • One or more SIBs (belonging to the fabric plane) in the Online or Spare states has transitioned to the Check state. Check state of the SIB can be caused by link errors or destination errors. • Fault: Fabric plane is in alarmed state if one or more SIBs belonging to the plane are in the Fault state. A SIB can be in the Fault state because of the following reasons: <ul style="list-style-type: none"> • On-board fabric ASIC is not operational. • Fiber optic connector faults. • FPC connector faults. • SIB midplane connector faults. • Link errors have exceeded the threshold. 	none
Link Errors	(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.	none
Cable Errors	(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
Destination Errors	(TX Matrix Plus routers with 3D SIBs only) Indicates the number of destinations that are not reachable on this plane.	none
Uptime	(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

Table 84: show chassis fabric plane Output Fields (*continued*)

Field Name	Field Description	Level of output
PLANE number	<p>State of the fabric plane:</p> <ul style="list-style-type: none"> • Online: Fabric plane is operational and running and links on the SIB are operational. • Offline: Fabric plane state is Offline because the plane does not have 4 or more F2S and 1 F13 online. • Empty: Fabric plane state is Empty if all SIBs in the plane are absent. • Spare: Fabric plane is redundant and can be operational if the operational fabric plane encounters an error. • Check: 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"> • One or more SIBs (belonging to the fabric plane) in the Online or Spare states has transitioned to the Check state. Check state of the SIB can be caused because of link errors or destination errors. • Fault: Fabric plane is in alarmed state if one or more SIBs belonging to the plane are in the Fault state. A SIB can be in the Fault state because of the following reasons: <ul style="list-style-type: none"> • On-board fabric ASIC is not operational. • Fiber optic connector faults. • FPC connector faults. • SIB midplane connector faults. • Link errors have exceeded the threshold. 	extensive
SIB F13/F2S slot-number	<p>State of the TXP-F13 SIB or TXP-F2S SIB:</p> <ul style="list-style-type: none"> • Activating—Transitional state when the SIB is transitioning to the Online or Spare state. • Deactivating—Transitional state when the SIB is going offline. • Online—SIB is operational and running. • Offline—SIB is powered down. • Spare—SIB is redundant and will move to active state if one of the working SIBs fails to pass traffic. • Empty—No SIB is present. • Fault—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"> • On-board fabric ASIC is not operational. • Fiber optic connector faults. • FPC connector faults. • SIB midplane connector faults. • Link errors have exceeded the threshold • Check—SIB is in alarmed state where the SIB is partially operational because of link or destination errors. Only a SIB that is Online or Spare can transition to the Check state. <p>NOTE: If a SIB is not inserted properly, the SIB cannot transition to the Online or Spare state, and therefore cannot transition to the Check state.</p>	extensive

Table 84: show chassis fabric plane Output Fields (*continued*)

Field Name	Field Description	Level of output
SIB F13 slot-number Odd/Even	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 Even and provide connections to one even-numbered LCC—LCC0 or LCC2. The right four ports on the SFC are labeled Odd and provide connections to one odd-numbered LCC—LCC1 or LCC3.	extensive
LCC number, SIB slot-number	<p>State of the SIB on the LCC that is connected to the Even or Odd port on the TXP-F13 SIB faceplate:</p> <ul style="list-style-type: none"> • Links ok—Links between the TXP-F13 SIB on the SFC and the LCC are active. • Links error—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. • Unused—No SIB is present. 	extensive
SG number Port number	<p>State of the SG chip ports on the LCC:</p> <ul style="list-style-type: none"> • Links ok—Link is active. • Link error—Link is operational with errors. • Link error crc saturated—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. • Link error crc saturated with optical errors—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. • Unused—Port is not in use. 	extensive
SIB F2S slot-number	State of the intra-chassis links between the TXP-F2S and TXP-F13 SIBs.	extensive

Fabric Management SIB State Output Fields for the show chassis fabric plane extensive Command on a TX Matrix Plus Router

Table 84: show chassis fabric plane Output Fields (*continued*)

Field Name	Field Description	Level of output
SIB slot-number	<p>State of the SIBs on the T1600/T4000 router (LCC) in the routing matrix:</p> <ul style="list-style-type: none"> • Activating—Transitional state when the SIB is coming online. • Deactivating—Transitional state when the SIB is going offline. • Connected—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 Connected 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. • Disconnected—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 Disconnected state is valid only for SIBs on an LCC. An LCC SIB transitions to the Disconnected state when the F13 SIB to which it connects goes Offline, irrespective of the state of the SFC plane. SFC Error—If an F13 SIB on the TX Matrix Plus router (SFC) transitions to the Fault 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 SFC Error state. This state indicates that the F13 SIB to which the LCC SIB is connected has errors. NOTE: The Connected, Disconnected, and SFC Error states are applicable only to the SIBs on an LCC. • Online—SIB is operational and running. • Offline—SIB is powered down. • Spare—SIB is redundant and will move to active state if one of the working SIBs fails to pass traffic. • Empty—No SIB is present. • Fault—SIB is in alarmed state where the SIB's plane is not operational for the following reasons: <ul style="list-style-type: none"> • On-board fabric ASIC is not operational. • Fiber optic connector faults. • FPC connector faults. • SIB midplane connector faults. • Link errors have exceeded the threshold • Check—SIB is in alarmed state where the SIB is partially operational because of link or destination errors. Only a SIB that is Online or Spare can transition to the Check state. NOTE: If a SIB is not inserted properly, the SIB cannot transition to the Online or Spare state, and therefore cannot transition to the Check state. 	extensive

Table 84: show chassis fabric plane Output Fields (*continued*)

Field Name	Field Description	Level of output
LCC SIB Link State	State of the LCC SIB link: <ul style="list-style-type: none"> • Links ok—Link is active. • Links error—A link error has occurred, but the link remains operational. • Unused—SIB is not in use. 	extensive
SG number Port number	State of the SG chip ports on the LCC: <ul style="list-style-type: none"> • Links ok—Link is active. • Link error—Link is operational with errors. • Link error crc saturated—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. • Link error crc saturated with optical errors—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. • Unused—Port is not in use. 	extensive

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 (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 (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, 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
1     Online     NONE         NONE         NONE                5 hours, 11
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
1     Online     NONE         NONE         NONE                5 hours, 11
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 7

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, 14 minutes, 34 seconds


```

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                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                NONE
1      Online       NONE        NONE        NONE                1 day, 18
hours, 14 minutes, 20 seconds
2      Offline      NONE        NONE        NONE                NONE
3      Offline      NONE        NONE        NONE                NONE
4      Offline      NONE        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-location

List of Syntax	Syntax on page 1225 Syntax (MX Series Routers) on page 1225 Syntax (MX2010 3D Universal Edge Routers) on page 1225 Syntax (MX2020 3D Universal Edge Routers) on page 1225 Syntax (TX Matrix Plus Router) on page 1225 Syntax (QFX Switches) on page 1225
Syntax	show chassis fabric plane-location
Syntax (MX Series Routers)	show chassis fabric plane-location <all-members> <local> <member <i>member-id</i> >
Syntax (MX2010 3D Universal Edge Routers)	show chassis fabric plane-location
Syntax (MX2020 3D Universal Edge Routers)	show chassis fabric plane-location
Syntax (TX Matrix Plus Router)	show chassis fabric plane-location
Syntax (QFX Switches)	show chassis fabric plane-location
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 12.1x48 for PTX Series Packet Transport Routers. Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers. Command introduced in Junos OS Release 15.1X53-D30 for QFX Series switches.
Description	<p>(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 <i>EX Series Switches Hardware and CLI Terminology Mapping</i>.</p> <p>(TX Matrix Plus routers only) Display the SIB location of each fabric plane.</p> <p>(PTX Series Packet Transport Routers and QFX Series switches only) Display the fabric plane location of each SIB.</p> <p>(MX2010 and MX2020 Routers only) Display the fabric plane location of each Switch Fabric Board (SFB).</p>

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.

Required Privilege Level view

List of Sample Output [show chassis fabric plane-location \(M120 Router\) on page 1227](#)
[show chassis fabric plane-location \(MX240 and MX480 Routers\) on page 1227](#)
[show chassis fabric plane-location \(MX960 Router\) on page 1227](#)
[show chassis fabric plane-location \(MX2010 Router\) on page 1227](#)
[show chassis fabric plane-location \(MX2020 Router\) on page 1228](#)
[show chassis fabric plane-location \(TX Matrix Plus Router\) on page 1228](#)
[show chassis fabric plane-location \(TX Matrix Plus Router with 3D SIBs\) on page 1228](#)
[show chassis fabric plane-location \(EX8200 Switch\) on page 1228](#)
[show chassis fabric plane-location \(PTX Series Packet Transport Routers\) on page 1228](#)
[show chassis fabric plane-location \(QFX 10008 Switch\) on page 1229](#)

Output Fields [Table 85 on page 1226](#) 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 85: 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 and MX2020 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.

Table 85: show chassis fabric plane-location Output Fields (*continued*)

Field Name	Field Description
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 and MX2020 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 (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 (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 (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 (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

Syntax	show chassis fabric redundancy-mode
Release Information	Command introduced in Junos OS Release 12.2.
Description	(MX240, MX480, and MX960 routers only) Display whether redundancy mode is configured for active control boards to enable increased fabric bandwidth usage.
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• Detection and Corrective Actions of FPCs with Degraded Fabric on MX Series Routers on page 409• Detection and Recovery of Fabric-Related Failures Caused by Traffic Black Holes on MX Series Routers on page 404• Corrective Actions for Fabric Failures on MX Series Routers on page 406• redundancy-mode on page 650• Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 413
List of Sample Output	show chassis fabric redundancy-mode on page 1230
Output Fields	Table 86 on page 1230 lists the output fields for the show chassis fabric redundancy-mode command. Output fields are listed in the approximate order in which they appear.

Table 86: 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

Syntax	show chassis fabric reachability <detail>
Release Information	<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 12.1X48R4 for PTX Series Packet Transport Switches.</p> <p>Command introduced in Junos OS Release 13.1R3 for TX Matrix routers.</p>
Description	(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.
Options	<p>none—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>detail—(Optional) Display the details of the actions carried out by the system in the different action phases and the final resolution.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show chassis fabric unreachable-destinations on page 1289
List of Sample Output	<p>show chassis fabric reachability (T640 and T1600 routers) on page 1235</p> <p>show chassis fabric reachability detail (T640 and T1600 routers) on page 1235</p> <p>show chassis fabric reachability (PTX5000 system) on page 1236</p> <p>show chassis fabric reachability (TX Matrix router) on page 1236</p> <p>show chassis fabric reachability detail (TX Matrix router) on page 1237</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 87: 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"> • Enabled destinations transitioned to unreachable, Fabric down action in progress—Some enabled destinations that were originally reachable have become unreachable. The system is trying to stop the fabric down condition and attempt healing. • Enabled destinations reachable—The enabled destinations are reachable. • Unreachable destinations healed—The unreachable destinations are healed and are reachable. • Unreachable destinations removed—The unreachable destinations are removed. • Unreachable destinations present—Unreachable destinations are present in the system. • Unreachable destinations present due to FPC restart disable configuration—Unreachable destinations are present as a result of user configuration set to disable FPC restart. 	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"> • Single FPC error—A single bad FPC is not reachable over the fabric. • Fabric plane error—Multiple FPCs are not able to forward traffic over the fabric planes. 	All levels
Fabric reachability action	Action taken to handle the unreachable destination. <ul style="list-style-type: none"> • Plane Action—The healing is attempted only for the fabric planes. • SIB Action—(PTX Series system only) The healing is attempted only for the SIBs. • Plane and FPC Action—The healing is attempted both for the fabric planes and the FPCs. • SIB and FPC Action—(PTX Series system only) The healing is attempted both for the SIBs and the FPCs. • FPC Action—The healing is attempted only for the bad FPCs. 	All levels
Acting on	Current action is being performed on: <ul style="list-style-type: none"> • Single FPC error—The current operation is for healing the single bad FPC. • Fabric Plane error—The current operation is for healing the fabric planes. 	All levels

Table 87: 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"> • Plane restart—The fabric planes are restarted. • SIB restart—(PTX Series system only) The SIBs are restarted. • Plane and FPC restart—Both the fabric planes and affected FPCs are restarted. • SIB and FPC restart—(PTX Series system only) SIBs and affected FPCs are restarted. 	All levels
Current phase	Current phase for the healing action. <ul style="list-style-type: none"> • Plane restart—The fabric planes are restarted. • SIB restart—(PTX Series system only) The SIBs are restarted. • Plane and FPC restart—Both the fabric planes and affected FPCs are restarted. • SIB and FPC restart—(PTX Series system only) Both the SIBs and affected FPCs are restarted. • FPC offline—The FPCs are turned offline because the previously mentioned healing processes have failed. 	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"> • Completed—The plane restart phase is completed. • In progress—The plane restart phase is in progress. 	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"> • Completed—The plane and FPC restart phase is completed. • In progress—The plane and FPC restart phase is in progress. 	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 87: 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.	detail
FPC being offlined	FPC that is being turned offline by the system, with date and time.	detail
FPC Offline completed	Date and time when the FPC offline action is completed.	detail
Plane restarting started	Date and time when the plane restart action is started.	detail
Planes restarted	List of planes restarted by the system.	detail
Planes being offlined / onlined	Planes that are currently being turned offline or turned online by the system, with date and time.	detail
Plane restarting completed	Date and time when the plane restarting action is completed.	detail
FPC online started	Date and time when FPC online action is started.	detail
Onlined FPCs	List of FPCs that are turned online by the system.	detail
FPCs timed out	FPCs that have timed out waiting to be turned online by the system.	detail
FPC being onlined	FPC that is being turned online by the system, with date and time.	detail
FPC Online completed	Date and time when the action of turning the FPCs online is completed.	detail
Phase Completed	Date and time when the plane and FPC restart phase is completed.	detail
Phase started	Date and time when the plane and FPC restart phase is started.	detail
FPC restart time	Date and time when the FPC restart action is started.	detail
FPC restarted	FPC that is restarted by the system, with date and time.	detail
Phase Completed	Date and time when the plane and FPC restart phase is completed.	detail
FPC Offline Phase	Status of the FPC offline phase. <ul style="list-style-type: none"> • Completed— The FPC offline phase is completed. • In progress—The FPC offline phase is currently in progress. 	detail
Phase started	Date and time when the FPC offline phase is started.	detail
FPC Offline started	Date and time when the FPC offline action is started.	detail
Offlined FPCs	List of FPCs turned offline by the system.	detail
FPCs timed out	List of FPCs that have timed out waiting to be turned offline by the system.	detail

Table 87: 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.	detail
FPC Offline completed	Date and time when the FPC offline action is completed.	detail
Phase Completed	Date and time when the FPC offline phase is completed.	detail
Action Completed	Date and time when the system fabric down healing attempt is completed.	All levels
Fabric reachability resolution	<p>Status after the healing actions are performed.</p> <ul style="list-style-type: none"> • Unreachable destinations healed after <i>phase name</i>—The unreachable destinations are healed after the healing actions are performed. The phase name indicates the last healing phase. • Unreachable destinations removed by FPCs <i>FPC number</i> offline—The unreachable destinations are removed by turning the FPCs offline. • Unreachable destinations present on FPC/PFE <i>FPC/PFE number</i>—The unreachable destinations are present on the FPCs or Packet Forwarding Engines and need to be acted upon. 	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 (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 sibs

Syntax	<code>show chassis fabric sibs</code> <code><lcc <i>number</i> | scc></code> <code><slot <i>slot-number</i>></code>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced on QFX Series switches in Junos OS Release 15.1X53-D30
Description	<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>
Options	<p>none—(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>lcc <i>number</i>—(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>scc—(Optional) Display the switching fabric link state for the TX-SIBs on the TX Matrix router (switch-card chassis).</p> <p>slot <i>slot-number</i>—(Optional) Display the state of the electrical switch fabric link between the specified SIB slot and the FPCs.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• request chassis sib on page 755• show chassis sibs on page 1646• <i>Monitoring the SIBs</i>• <i>Redundant SIBs Overview</i>
List of Sample Output	<ul style="list-style-type: none">• show chassis fabric sibs (M320 Router) on page 1241• show chassis fabric sibs (T640 Router) on page 1241• show chassis fabric sibs (T1600 Router) on page 1242• show chassis fabric sibs (T4000 Core Router) on page 1244• show chassis fabric sibs (TX Matrix Router) on page 1245• show chassis fabric sibs lcc (TX Matrix Router) on page 1247• show chassis fabric sibs scc (TX Matrix Router) on page 1248• show chassis fabric sibs slot (PTX3000 Router) on page 1248• show chassis fabric sibs (QFX10008 Switch) on page 1249

Output Fields Table 88 on page 1239 lists the output fields for the **show chassis fabric sibs** command. Output fields are listed in the approximate order in which they appear.

Table 88: show chassis fabric sibs Output Fields

Field Name	Field Description
Fabric management SIB state	Switching fabric link (link from FPC to SIB) state for each SIB: <ul style="list-style-type: none">• Unused—SIB is not present.• Links ok—Link between the SIB and the FPC is active.• Link error—Link between the SIB and the FPC is not operational.

Table 88: 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"> • S_ACTIVE—Links on the SIB are operational, and the fabric plane (SIB) is operational and running. • S_SPARE—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 S_ACTIVE state encounters an error. <p>NOTE: If the plane is unusable by any of the Packet Forwarding Engines, the command output displays an additional string, plane has link errors on # pfes, 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"> • S_EMPTY—No links are present on the SIB, and the fabric plane (SIB) is powered down. • S_ACTIVATING—Links on the SIB are coming online; this is a transitional state. • S_DEACTIVATING—Links on the SIB are going offline; this is a transitional state. • S_FAULTING—Links on the SIB are being marked faulty, and the fabric plane (SIB) is not operational. • S_FAULT—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"> • On-board F-chip is not operational. • Fiber optic connector faults. • FPC connector faults. <p>Possible plane state of the QFX Series SIB:</p> <ul style="list-style-type: none"> • Active—Links on the SIB are operational, and the fabric plane (SIB) is operational and running. • Spare—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 S_ACTIVE state encounters an error. • Empty—No links are present on the SIB, and the fabric plane (SIB) is powered down. • Activating—Links on the SIB are coming online; this is a transitional state. • Deactivating—Links on the SIB are going offline; this is a transitional state. • Faulting—Links on the SIB are being marked faulty, and the fabric plane (SIB) is not operational. • Fault—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"> • On-board F-chip is not operational. • Fiber optic connector faults. • FPC connector faults.

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 (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

Syntax	<code>show chassis fabric summary <extended></code>
Release Information	<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 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 15.1X53-D30 for QFX Series switches.</p> <p>extended option added in Junos OS Release 14.1R2.</p>
Description	<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>
Options	extended —(Optional) Display the extended summary of fabric planes.
Required Privilege Level	view
List of Sample Output	<p>show chassis fabric summary (MX240 Router) on page 1252</p> <p>show chassis fabric summary (MX480 Router) on page 1252</p> <p>show chassis fabric summary (MX480 Router with MPC4E) on page 1252</p> <p>show chassis fabric summary (MX960 Router) on page 1253</p> <p>show chassis fabric summary (MX2010 Router) on page 1253</p> <p>show chassis fabric summary (MX2020 Router) on page 1253</p> <p>show chassis fabric summary (MX2020 Router with MPC4E) on page 1253</p> <p>show chassis fabric summary (EX8200 Switch) on page 1254</p> <p>show chassis fabric summary (PTX Series Packet Transport Router) on page 1254</p> <p>show chassis fabric summary (QFX 10008 Switch) on page 1254</p> <p>show chassis fabric summary extended (MX960 Router) on page 1255</p>
Output Fields	<p>Table 89 on page 1250 lists the output fields for the show chassis fabric summary command. Output fields are listed in the approximate order in which they appear.</p>

Table 89: show chassis fabric summary Output Fields

Field Name	Field Description
Plane	(MX Series, MX2020 and MX2010 Routers only) Plane number.

Table 89: show chassis fabric summary Output Fields (*continued*)

Field Name	Field Description
State	<p>(MX Series and QFX Series) State of the SIB or FPC:</p> <ul style="list-style-type: none"> • Online—Switch Interface Board (SIB) is operational and running. <p>NOTE: 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"> • Empty—SIB is powered down. • Check—SIB is in the Check state because of the following reasons: <ul style="list-style-type: none"> • SIB is not inserted properly. • 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. • 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"> • Link errors caused by a link training failure at initialization time—The Packet Forwarding Engine does not use the SIB to send traffic. The show chassis fabric fpcs command shows Plane disabled as status for this link. • Link errors caused by CRC errors detected at runtime—The Packet Forwarding Engine continues to use the SIB to send traffic. The show chassis fabric fpcs command shows Link error as the status for this link. <p>NOTE: The Check 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 show chassis fabric fpcs commands.</p> <ul style="list-style-type: none"> • Spare—SIB is redundant and will move to active state if one of the working SIBs fails. <p>NOTE: Spare does not apply to PTX Series Packet Transport Routers because there are no spare SIBs in the device.</p> <p>(MX2010 and MX2020 Routers) State of the SFB.</p> <ul style="list-style-type: none"> • Online—Switch Fabric Board (SFB) is operational and running. • Offline—Switch Fabric Board (SFB) is powered down. • Check—Switch Fabric Board (SFB) is in the check state.
Errors	<p>(PTX Series and QFX Series) Indicates whether there is any error on the SIB.</p> <ul style="list-style-type: none"> • None—No errors • Link Errors—Fabric link errors were found on the SIB RX link. • Cell drops—Fabric cell drops were found on the SIB ASIC. • Link, Cell drops—Both Link errors and cell drops were detected on at least one of the FPC's fabric links.

Table 89: show chassis fabric summary Output Fields (*continued*)

Field Name	Field Description
	<ul style="list-style-type: none"> Asic Errors—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. <p>NOTE: The Errors column is empty only when the FPC or SIB is offline.</p>
Uptime	(MX Series, MX2010 and MX2020 Routers) Elapsed time the plane has been online.
Link Error	Fabric link errors were found on the SIB RX link.
Link TF	Fabric link training failure has occurred.
Destination errors	<ul style="list-style-type: none"> Local—Destination error detected on the FPC or PFE's own self-stream. Remote—Destination error detected on the FPC or PFE's non-self-streams.

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 (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 (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 (PTX Series Packet Transport Router)

```
user@host> show chassis fabric summary
FRU      State    Errors
SIB0     Online   Asic Errors
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 (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  Link  Destination errors  Uptime
      Error TF   Local / Remote
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 topology

List of Syntax	Syntax on page 1256 Syntax (TX Matrix Router) on page 1256 Syntax (TX Matrix Plus Router) on page 1256 Syntax (T4000 Core Router) on page 1256 Syntax (PTX Series Packet Transport Routers) on page 1256 Syntax (QTX Series Switches) on page 1256
Syntax	show chassis fabric topology <lcc <i>number</i> | scc> <sib-slot>
Syntax (TX Matrix Router)	show chassis fabric topology <lcc <i>number</i> | scc> <sib-slot>
Syntax (TX Matrix Plus Router)	show chassis fabric topology <lcc <i>number</i> | sfc <i>number</i> > <sib-slot>
Syntax (T4000 Core Router)	show chassis fabric topology <sib-slot>
Syntax (PTX Series Packet Transport Routers)	show chassis fabric topology
Syntax (QTX Series Switches)	show chassis fabric topology
Release Information	Command introduced before Junos OS Release 7.4. sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6. Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Routers. Command introduced in Junos OS Release 15.1X53-D30 for QFX Series switches.
Description	(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. (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 1261](#)
[show chassis fabric topology lcc on page 1263](#)
[show chassis fabric topology \(TX Matrix Plus Router\) on page 1265](#)
[show chassis fabric topology sfc \(TX Matrix Plus Router\) on page 1266](#)
[show chassis fabric topology lcc \(TX Matrix Plus Router\) on page 1267](#)
[show chassis fabric topology \(T4000 Core Router\) on page 1268](#)
[show chassis fabric topology lcc \(TX Matrix Plus Router with 3D SIBs\) on page 1269](#)
[show chassis fabric topology sfc \(TX Matrix Plus Router with 3D SIBs\) on page 1271](#)

[show chassis fabric topology \(PTX5000 Router\) on page 1275](#)
[show chassis fabric topology \(PTX3000 Router\) on page 1278](#)
[show chassis fabric topology \(QFX10008 Switch\) on page 1285](#)

Output Fields Table 90 on page 1258 lists the output fields for the **show chassis fabric topology** command. Output fields are listed in the approximate order in which they appear.

Table 90: show chassis fabric topology Output Fields

Field Name	Field Description
in-links	Fabric topology for receive side links.
out-links	Fabric topology for transmit side links.
state	<p>State of the fabric link:</p> <ul style="list-style-type: none"> • RESET—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. • UP—Link between the SIB and the FPC/DCP is up and running. • DOWN—Link between the SIB and the FPC/DCP is powered down. • FAULT—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"> • On-board F-chip is not operational. • Fiber-optic connector faults. • FPC connector faults. • SIB midplane connector faults. <p>NOTE: The following state descriptions are applicable only to PTX Series Packet Transport Routers.</p> <ul style="list-style-type: none"> • OK—The link between the SIB and the FPC is operational. • Down—The link between the SIB and the FPC is powered down. • Error—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"> • FPC midplane connector failure. • SIB midplane connector failure. • CCL link CRC error.

Table 90: show chassis fabric topology Output Fields (*continued*)

Out-Links: and In-Links (TX Matrix Plus router only)	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:
	<ul style="list-style-type: none"> • VCSEL Status—Optical (VCSEL channel) link status for the corresponding electrical (HSL2) link. The states include: <ul style="list-style-type: none"> • OK—Optical signal power is good. • Error—Internal error. • LOS—Loss of Signal detected. • High Cur—The Tx Bias-current is higher than threshold on this channel. This is applicable only to Tx Channels. • Low Cur—The Tx Bias-current is lower than threshold on this channel. This is applicable only to Tx Channels. • HSL2 Channel—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.

- **HSL2 Status** —The status of the HSL2 Channel. Includes the following states:
 - **Up**—Channel is up.
 - **Down**—Channel is down.
 - **Reset**—Channel has been reset.
 - **Fault**—Channel has faults.

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 90: 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 90: 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:			
	<ul style="list-style-type: none"> 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-re1:
```

```
-----
fchip (mode)
in-links      state  out-links      state
-----
```

```
Sib #0 :
```

```
-----
SIB0_F0 (F2 ):
```

```
LCC0_SIB-L0_F0,03->SIB-S0_F0,00  UP      SIB-S0_F0,00->LCC0_SIB-L0_F1,00  UP
LCC1_SIB-L0_F0,03->SIB-S0_F0,01  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   -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
lcc0-re0:

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-----
      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

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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

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show chassis fabric topology (TX Matrix Plus Router)

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user@host> show chassis fabric topology
sfc0-re0:

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F13_SIB0

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Out-Links:

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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

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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
...

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show chassis fabric topology sfc (TX Matrix Plus Router)

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user@host> show chassis fabric topology sfc 0
sfc0-re0:

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F13_SIB0

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Out-Links:

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SFC0_F13_SIB_00	-> LCC00_ST_SIB_L00	VCSEL Status	HSL2 Channel	HSL2 Status
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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

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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
...

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show chassis fabric topology lcc (TX Matrix Plus Router)

```

user@host> show chassis fabric topology lcc 0
lcc0-re0:

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SIB0

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Out-Links:

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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
...

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show chassis fabric topology (T4000 Core Router)

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user@host> show chassis fabric topology 0
fchip (mode)

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In-links	State	Out-links	State
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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:
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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
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
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

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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
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

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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
F2S_SIB1_XF,13_0->F13_SIB0_XF6,12_0 Up	F13_SIB0_XF6,12_0->F2S_SIB1_XF,13_0 Up
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
F2S_SIB1_XF,11_0->F13_SIB0_XF6,15_0 Up	F13_SIB0_XF6,15_0->F2S_SIB1_XF,11_0 Up
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
F13_SIB0_XF5,03_0->F2S_SIB2_XF,10_0 Up	F2S_SIB2_XF,10_0->F13_SIB0_XF5,03_0 Up
F13_SIB0_XF5,04_0->F2S_SIB3_XF,12_0 Up	F2S_SIB3_XF,12_0->F13_SIB0_XF5,04_0 Up

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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
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

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show chassis fabric topology (PTX5000 Router)

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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


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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

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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)

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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 :

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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

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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

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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

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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
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

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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

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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

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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

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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
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

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
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 (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 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.
Description	Display the current state of reachability between the Packet Forwarding Engines in the system.
Additional Information	
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show chassis fabric errors on page 1120 • show chassis fabric reachability on page 1231 • degraded on page 550
List of Sample Output	show chassis fabric degraded-fabric-reachability on page 1287
Output Fields	Table 76 on page 1106 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 91: 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 unreachable-destinations

Syntax	show chassis fabric unreachable-destinations
Release Information	Command introduced before Junos OS Release 11.4. Command introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Switches. Command introduced in Junos OS Release 13.1R3 for TX Matrix routers.
Description	(M320 and T Series routers only) Display the list of destinations that have transitioned from a reachable state to an unreachable state.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> show chassis fabric reachability on page 1231
List of Sample Output	show chassis fabric unreachable-destinations(T640 and T1600 routers) on page 1289 show chassis fabric unreachable-destinations(TX Matrix routers) on page 1290
Output Fields	The table lists the output fields for the show chassis fabric unreachable-destinations command. Output fields are listed in the approximate order in which they appear.

Table 92: 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

List of Syntax	Syntax on page 1292 Syntax (ACX4000 Series Router) on page 1292 Syntax (MX Series Router) on page 1292 Syntax (T Series Routers) on page 1292 Syntax (MX104, MX2010, and MX2020 3D Universal Edge Router) on page 1292 Syntax (QFX Series) on page 1292 Syntax (OCX Series) on page 1292 Syntax (TX Matrix Router) on page 1292 Syntax (TX Matrix Plus Router) on page 1292
Syntax	show chassis fan
Syntax (ACX4000 Series Router)	show chassis fan
Syntax (MX Series Router)	show chassis fan <all-members> <local> <member <i>member-id</i> >
Syntax (T Series Routers)	show chassis fan
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Router)	show chassis fan <satellite [<i>slot-id slot-id</i> | <i>device-alias alias-name</i>]>
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> | <i>scc</i> >
Syntax (TX Matrix Plus Router)	show chassis fan <lcc <i>number</i> | <i>sfc number</i> >
Release Information	Command introduced in Junos OS Release 10.0 on MX Series 3D Universal Edge Routers, M120 routers, and M320 routers, T320 routers, T640 routers, T1600 routers, TX Matrix Routers, and TX Matrix Plus routers. Command introduced in Junos OS Release 11.1 for the QFX Series. Command introduced in Junos OS Release 11.4 for EX Series switches. Command introduced in Junos OS Release 12.3 for PTX5000 Packet Transport Routers. Command introduced in Junos OS Release 12.1 for T4000 routers. Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for ACX Series Routers.

Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.
 Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
satellite option introduced in Junos OS Release 14.2R3.

- Description** (T Series routers, TX Matrix routers, TX Matrix Plus routers, M120 routers, M320 routers, MX104 routers, MX2010 routers, MX2020 routers, MX Series 3D Universal Edge Routers, 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.
- Options**
- all-members**—(MX Series routers only) (Optional) Display information about the fan tray and fans for all members of the Virtual Chassis configuration.
- local**—(MX Series routers only) (Optional) Display information about the fan tray and fans for the local Virtual Chassis member.
- 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

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[show chassis fan \(QFabric Systems\) on page 1295](#)
[show chassis fan \(EX Series Switches\) on page 1297](#)
[show chassis fan \(T320 Router\) on page 1297](#)
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[show chassis fan \(TX Matrix Plus Router with 3D SIBs\) on page 1301](#)
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[show chassis fan \(QFX5100 Switch and OCX Series\) on page 1304](#)

Output Fields Table 75 on page 1094 lists the output fields for the **show chassis fan** command. Output fields are listed in the approximate order in which they appear.

Table 93: show chassis fan Output Fields

Field Name	Field Description
Item	Fan item identifier.
Status	Status of the fan: <ul style="list-style-type: none"> • OK—Fan is running properly and within the normal range. • Check—Fan is in Check state because of some fault or alarm condition.
RPM	(T Series routers, TX Matrix routers, TX Matrix Plus routers, MX Series 3D Universal Edge Routers, QFX3108 Interconnect devices, and EX Series switches only) Fan speed in revolutions per minute (RPM).
% RPM	(MX2010 routers, MX2020 routers, and PTX Series Packet Transport Routers only) Percentage of the fan speed being used.

Table 93: show chassis fan Output Fields (*continued*)

Field Name	Field Description
Measurement	<p>(T Series routers, TX Matrix routers, TX Matrix Plus routers, MX Series 3D Universal Edge Routers, QFX3108 Interconnect devices, and EX Series switches only) Fan speed status based on different chassis cooling requirements:</p> <ul style="list-style-type: none"> • Spinning at high speed • Spinning at intermediate speed • Spinning at normal speed • Spinning at low speed (except EX Series switches) <p>(MX2010 routers, MX2020 routers, and PTX Series Packet Transport Routers only) Fan speed in revolutions per minute (RPM) for each fan in the fan tray.</p>

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

```
1cc2-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> 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	

1cc0-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

1cc2-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 (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 > 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 (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 (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 feb

Syntax	show chassis feb
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers.
Description	(ACX Series routers, and M5, M10, and M120 routers only) Display Forwarding Engine Board (FEB) status information.
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • request chassis feb on page 723 • show chassis fabric feb on page 1119 • show chassis fpc-feb-connectivity on page 1365 • <i>feb</i> • <i>Understanding Switching Control Board Redundancy</i>
List of Sample Output	show chassis feb (M10 Router) on page 1307 show chassis feb (M120 Router) on page 1307 show chassis feb detail (M120 Router) on page 1308 show chassis feb detail (ACX2000 Universal Access Router) on page 1309 show chassis feb detail (ACX1000 Universal Access Router) on page 1309
Output Fields	Table 94 on page 1306 lists the output fields for the show chassis feb command. Output fields are listed in the approximate order in which they appear.

Table 94: show chassis feb

Field Name	Field Description
State	State of the FEB: <ul style="list-style-type: none"> • Offline—FEB is powered down. • Online—FEB is operational and running. • 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"> • FEB is not inserted properly. • Two or more links between the FEB and Packet Forwarding Engine fail.
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 94: show chassis feb (continued)

Field Name	Field Description
CPU Utilization (%)	Percentage of CPU being used: <ul style="list-style-type: none"> • Total—Total percentage of CPU being used by the FEB processor. • Interrupt—Of the total CPU being used by the FEB processor, the percentage being used for interrupts.
Memory DRAM (MB)	Total DRAM, in megabytes, available to the FEB processor.
Utilization (%)	Percentage of memory utilization: <ul style="list-style-type: none"> • Heap—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). • Buffer—Percentage of buffer space being used by the FPC processor for buffering internal messages.
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 RLDRAM	Amount of reduced latency dynamic random access memory (RLDRAM) 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 (C)	CPU Utilization (%)		Memory DRAM (MB)	Utilization (%)	
			Total	Interrupt		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 RLD RAM                        32 MB
  Start time:                         2006-06-28 15:00:27 PDT
  Uptime:                             10 minutes, 34 seconds

```


show chassis feb detail (ACX2000 Universal Access 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 Access 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

List of Syntax	Syntax on page 1310 Syntax (TX Matrix Routers) on page 1310 Syntax (TX Matrix Plus Routers) on page 1310 Syntax (MX Series Routers) on page 1310 Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers) on page 1310 Syntax (QFX Series) on page 1310 Syntax (OCX Series) on page 1310 Syntax (ACX Series Universal Access Routers) on page 1310 Syntax (EX Series Switches) on page 1310
Syntax	show chassis firmware
Syntax (TX Matrix Routers)	show chassis firmware <lcc <i>number</i> | scc>
Syntax (TX Matrix Plus Routers)	show chassis firmware <lcc <i>number</i> | sfc <i>number</i> >
Syntax (MX Series Routers)	show chassis firmware <all-members> <local> <member <i>member-id</i> >
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)	show chassis firmware <satellite [slot-id <i>slot-id</i> | device-alias <i>alias-name</i>]>
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 Access 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	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.4 for EX Series switches. sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6. Command introduced for EX8200 switches in Junos OS Release 10.2 for EX Series switches. Command introduced in Junos OS Release 11.1 for QFX Series. Command introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers.

Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
 Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
 Command introduced in Junos OS Release 12.3 for ACX4000 Universal Access Routers.
 Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.
 Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
satellite option introduced in Junos OS Release 14.2R3.

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 \(M160 Router\) on page 1314](#)
[show chassis firmware \(MX104 Router\) on page 1314](#)
[show chassis firmware \(MX240 Router\) on page 1314](#)
[show chassis firmware \(MX480 Router\) on page 1315](#)
[show chassis firmware \(MX960 Router\) on page 1315](#)
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[show chassis firmware \(ACX2000 Universal Access Router\) on page 1320](#)
[show chassis firmware detail \(EX3300 Switch\) on page 1320](#)
[show chassis firmware \(MX Routers with Media Services Blade \[MSB\]\) on page 1320](#)

Output Fields Table 95 on page 1313 lists the output fields for the **show chassis firmware** command. Output fields are listed in the approximate order in which they appear.

Table 95: show chassis firmware Output Fields

Field Name	Field Description
Part	(MX Series, MX2010, and MX2020 routers) Chassis part name.
Type	(MX Series, MX2010, and MX2020 routers) Type of firmware: On routers: ROM or O/S . On switches: uboot or loader .
Version	(MX Series, MX2010, and MX2020 routers) Version of firmware running on the chassis part.
FPC	(<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.
AFEB	(MX104 routers) Version of the compact Forwarding Engine Board.
Boot	(<i>detail</i> option only) Version of the SYSPLD.
PoE	(<i>detail</i> option only) Version of the PoE firmware.
PFE-<number>	(<i>detail</i> option only) Version of the PFE used in the switch.
PHY-	(<i>detail</i> option only) Version of the physical layer device (PHY) used in the switch.
microcode	(<i>detail</i> option only) Microcode of the physical layer devices (PHY) used in the switch.
uboot	(<i>detail</i> option only) Version of the u-boot used in the switch.
loader	(<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
```

Part	Type	Version
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
	O/S	Version 4.0I1 by usera on 2000-02-29 11:56
FPC 2	ROM	Juniper ROM Monitor Version 4.0b3
	O/S	Version 4.0I1 by usera on 2000-02-29 11:56

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
	O/S	Version 12.3-20130415.0 by userb on 2013-
FPC 15	ROM	Juniper ROM Monitor Version 10.0b39
	O/S	Version 12.3-20130415.0 by userb on 2013-
FPC 16	ROM	Juniper ROM Monitor Version 10.0b39
	O/S	Version 12.3-20130415.0 by userb on 2013-
FPC 17	ROM	Juniper ROM Monitor Version 10.0b39
	O/S	Version 12.3-20130415.0 by userb on 2013-
FPC 18	ROM	Juniper ROM Monitor Version 10.0b39
	O/S	Version 12.3-20130415.0 by userb on 2013-
FPC 19	ROM	Juniper ROM Monitor Version 10.0b39
	O/S	Version 12.3-20130415.0 by userb on 2013-
SPMB 0	ROM	Juniper ROM Monitor Version 12.1b1
	O/S	Version 12.3-20130415.0 by userb on 2013-
SPMB 1	ROM	Juniper ROM Monitor Version 12.1b1
	O/S	Version 12.3-20130415.0 by userb on 2013-

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 loader	U-Boot 1.1.6 (Mar 25 2009 - 06:13:12) 2.4.0 FreeBSD/PowerPC U-Boot bootstrap loader 2.2
FPC 3	U-Boot loader	U-Boot 1.1.6 (Dec 4 2009 - 13:17:34) 3.1.0 FreeBSD/PowerPC U-Boot bootstrap loader 2.2
FPC 5	U-Boot loader	U-Boot 1.1.6 (Mar 25 2009 - 06:13:12) 2.4.0 FreeBSD/PowerPC U-Boot bootstrap loader 2.2
FPC 7	U-Boot loader	U-Boot 1.1.6 (Feb 6 2009 - 05:31:46) 2.4.0 FreeBSD/PowerPC U-Boot bootstrap loader 2.2
Routing Engine 0	U-Boot loader	U-Boot 1.1.6 (Mar 25 2009 - 06:13:12) 2.4.0 FreeBSD/PowerPC U-Boot bootstrap loader 2.2
Routing Engine 1	U-Boot loader	U-Boot 1.1.6 (Mar 25 2009 - 06:13:12) 2.4.0 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 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

1cc0-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

1cc1-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

1cc2-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

1cc3-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  U-Boot 1.1.6 (Sep 15 2010 - 02:11:11) 1.0.5
loader        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
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 interconnect-device (QFabric System)

```
user@switch> show chassis firmware interconnect-device interconnect1
Part          Type      Version
Routing Engine 0  U-Boot  U-Boot 1.1.6 (May 10 2011 - 04:52:59) 1.1.1
loader        FreeBSD/MIPS U-Boot bootstrap loader 0.1
Routing Engine 1  U-Boot  U-Boot 1.1.6 (May 10 2011 - 04:52:59) 1.1.1
loader        FreeBSD/MIPS U-Boot bootstrap loader 0.1
```

show chassis firmware (ACX2000 Universal Access 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           U-Boot 1.1.6 (Aug 21 2011 - 01:45:26) 1.0.0
    loader          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 forwarding

Syntax	show chassis forwarding
Release Information	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
Description	Display status of the forwarding process (fwdd). This command is supported on Branch SRX Series Services Gateways.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show chassis forwarding on page 1321
Output Fields	Table 96 on page 1321 lists the output fields for the show chassis forwarding command. Output fields are listed in the approximate order in which they appear.

Table 96: show chassis forwarding Output Fields

Field Name	Field Description
FWWD status	<p>Forwarding status:</p> <ul style="list-style-type: none"> • State: <ul style="list-style-type: none"> • Online—FWDD is operational and running. • Offline—FWDD is not running. • Microkernel CPU utilization—Percentage of microkernel CPU being used by the forwarding process. • Real-time threads CPU utilization—Percentage of CPU being used by the forwarding process. • Heap utilization—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). • Buffer utilization—Percentage of buffer space being used by the forwarding process for buffering internal messages. • Uptime—How long the forwarding process has been up and running.

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 1322 Syntax (EX Series Switches) on page 1322 Syntax (T4000 Routers) on page 1322 Syntax (TX Matrix and TX Matrix Plus Routers) on page 1322 Syntax (MX Series Router) on page 1322 Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers) on page 1322 Syntax (QFX Series) on page 1322 Syntax (OCX Series) on page 1322 Syntax (PTX Series Packet Transport Routers) on page 1322 Syntax (PTX Series Packet Transport Switches) on page 1323
Syntax	<code>show chassis fpc</code> <code><detail <slot>> | <pic-status <slot>></code>
Syntax (EX Series Switches)	<code>show chassis fpc</code> <code><detail <fpc-slot>> | <pic-status <fpc-slot>></code> <code><fpc-slot></code>
Syntax (T4000 Routers)	<code>show chassis fpc</code> <code><detail <fpc-slot>></code> <code><pic-status <fpc-slot>></code>
Syntax (TX Matrix and TX Matrix Plus Routers)	<code>show chassis fpc</code> <code><detail <fpc-slot>> | <pic-status <fpc-slot>></code> <code><slot></code>
Syntax (MX Series Router)	<code>show chassis fpc</code> <code><detail <slot>> | <pic-status <slot>></code> <code><all-members></code> <code><local></code> <code><member <i>member-id</i>></code>
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)	<code>show chassis fpc</code> <code><slot> detail | <detail <slot>> | <pic-status <slot>></code> <code><fpc-slot></code>
Syntax (QFX Series)	<code>show chassis fpc</code> <code><detail></code> <code><interconnect-device <i>name</i> <fpc-slot fpc-slot>></code> <code><node-device <i>name</i>></code>
Syntax (OCX Series)	<code>show chassis fpc</code> <code><detail></code>
Syntax (PTX Series Packet Transport Routers)	<code>show chassis fpc</code> <code><detail <fpc-slot>> | <pic-status <fpc-slot>></code> <code><fpc-slot></code>

Syntax (PTX Series Packet Transport Switches)	<pre>show chassis fpc <detail <fpc-slot>> | <pic-status <fpc-slot>> <fpc-slot></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 Access Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> <p>Command introduced in Junos OS Release 15.1 for MX104-40G 3D Universal Edge Routers.</p>
Description	Display status information about the installed Flexible PIC Concentrators (FPCs) and PICs.
Options	<p>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 T1600 routers in the routing matrix.</p>



NOTE: In EX8200 switches, line cards initialize Packet Forwarding Engine during start up. 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
Buffer			DRAM (MB) Heap
0 Empty			
1 Empty			
2 Empty			
3 Empty			
4 Empty			
5 Offline	---	Hard FPC error---	
6 Empty			
7 Online	26	4	0
32			1024 0

The following sample output shows the alarm raised for the failed FPCs.

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

```
4 alarms currently active
Alarm time      Class  Description
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 switches only) (Optional) Display status information for all FPCs on the Interconnect device.

fpc-slot—(Optional) FPC slot number:

- (TX Matrix and TX Matrix Plus router 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.
- 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.
- QFX Series:
 - QFX Series 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 Switches:
 - PTX5000 Packet Transport Router—Replace **fpc-slot** with a value from 0 through 7.
- ACX Series Universal Access Routers:
 - ACX1000 and ACX2000 Universal Access Routers—Replace **fpc-slot** with 0.

local—(MX Series routers 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 switches 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](https://www.juniper.net/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

- Related Documentation**
- [request chassis fpc on page 725](#)
 - [show chassis fpc-feb-connectivity on page 1365](#)
 - [show chassis fabric fpcs on page 1125](#)
 - [Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 333](#)
 - [MX960 Flexible PIC Concentrator Description](#)
 - [ACX2000 and ACX2100 Routers Hardware and CLI Terminology Mapping](#)
 - [enhanced-mode on page 557](#)

- List of Sample Output**
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 - [show chassis fpc \(M10 Router\) on page 1333](#)
 - [show chassis fpc \(M20 Router\) on page 1333](#)
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 - [show chassis fpc \(MX104 Router\) on page 1333](#)
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[show chassis fpc \(MX240, MX480, MX960 Routers with Application Services Modular Line Card\) on page 1341](#)
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[show chassis fpc lcc \(TX Matrix Router\) on page 1349](#)
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[show chassis fpc 1 \(MX Routers with Media Services Blade \[MSB\]\) on page 1361](#)
[show chassis FPC 1 detail \(MX Routers with Media Services Blade \[MSB\]\) on page 1361](#)

Output Fields [Table 97 on page 1330](#) lists the output fields for the **show chassis fpc** command. Output fields are listed in the approximate order in which they appear.

Table 97: show chassis fpc Output Fields

Field Name	Field Description	Level of Output
Slot or Slot State	Slot number and state. The state can be one of the following conditions: <ul style="list-style-type: none"> • Dead—Held in reset because of errors. • Diag—Slot is being ignored while the FPC is running diagnostics. • Dormant—Held in reset. • Empty—No FPC is present. • Offline—(PTX Series Packet Transport Routers only) One of the following two states is displayed: <ul style="list-style-type: none"> • FPC offlined due to unreachable destinations • FPC Offlined due to degraded FPC action • Online—FPC is online and running. • 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. • Probed—Probe is complete; awaiting restart of the Packet Forwarding Engine. • Probe-wait—Waiting to be probed. 	all levels
Logical slot	Slot number.	all levels

Table 97: show chassis fpc Output Fields (*continued*)

Field Name	Field Description	Level of Output
Temp (C) or Temperature	Temperature of the air passing by the FPC, in degrees Celsius or in both Celsius and Fahrenheit.	all levels all levels
Temperature (PTX Series)	On PTX Series Packet Transport Routers, temperature details are provided in degrees Celsius and Fahrenheit. Output includes: <ul style="list-style-type: none"> • Temperature (PMB)—Temperature of the air passing by the Processor Mezzanine Board (PMB) at the bottom of the FPC. • Temperature (Intake)—Temperature of the air flowing into the chassis. • Temperature (Exhaust)—Exhaust temperatures for multiple zones (Exhaust A and Exhaust B). • Temperature (TLn)—Temperature of the specified Lookup ASIC (TL) of the packet forwarding engine on the FPC. • Temperature (TQn)—Temperature of the specified Queuing and Memory Interface ASIC (TQ) of the packet forwarding engine on the FPC. 	detail
Total CPU Utilization (%)	Total percentage of CPU being used by the FPC's processor.	all levels
Interrupt CPU Utilization (%)	Of the total CPU being used by the FPC's processor, the percentage being used for interrupts.	none specified
1 min CPU utilization (%)	Information about the Routing Engine's CPU utilization in the past 1 minute.	none specified
NOTE: Supported only on MX240, MX480, MX960, MX2010, and MX2020.		
5 min CPU utilization (%)	Information about the Routing Engine's CPU utilization in the past 5 minutes.	none specified
NOTE: Supported only on MX240, MX480, MX960, MX2010, and MX2020.		
15 min CPU utilization (%)	Information about the Routing Engine's CPU utilization in the past 5 minutes.	none specified
NOTE: Supported only on MX240, MX480, MX960, MX2010, and MX2020.		
Memory DRAM (MB)	Total DRAM, in megabytes, available to the FPC's processor.	none specified

Table 97: show chassis fpc Output Fields (*continued*)

Field Name	Field Description	Level of Output
Heap Utilization (%)	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). NOTE: 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
Buffer Utilization (%)	Percentage of buffer space being used by the FPC's processor for buffering internal messages.	none specified
Total CPU DRAM	Amount of DRAM available to the FPC's CPU.	detail
Total RLDRAM	Amount of reduced latency dynamic random access memory (RLDRAM) available to the FPC CPU.	detail
Total DDR DRAM	Amount of double data rate dynamic random access memory (DDR DRAM) available to the FPC CPU.	detail
Total SRAM	Amount of static RAM (SRAM) used by the FPC's CPU.	detail
Total SDRAM	Total amount of memory used for storing packets and notifications.	detail
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

Sample Output

show chassis fpc (EX6210 Switch)

```

user@switch> show chassis fpc

```

Slot	State	Temp (C)	CPU Utilization (%)	Memory DRAM (MB)	Utilization (%)
			Total Interrupt		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:

      Temp
Slot State (C)
0  Online  27
1  Online  28

```

show chassis fpc (M20 Router)

```

user@host> show chassis fpc
FPC status:

      Temp CPU Utilization (%) Memory Utilization (%)
Slot State (C) Total Interrupt 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 (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 (MX104-40G 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      48    18         6                2048
9      13
1  Online      48    18         6                2048
9      13
2  Online      48    18         6                2048
9      13

```

show chassis fpc detail (MX104-40G Router)

```

user@host> show chassis fpc detail
Slot 0 information:
  State                Online
  Temperature          48 (C)
  Total CPU DRAM       2048 MB
  Total SRAM           403 MB

```

```

Total SDRAM                1316 MB
Start time                  2015-02-27 03:05:54 PST
Uptime                      2 hours, 38 minutes, 27 seconds
Slot 1 information:
State                       Online
Temperature                 48 (C)
Total CPU DRAM              2048 MB
Total SRAM                  403 MB
Total SDRAM                 1316 MB
Start time                  2015-02-27 03:05:55 PST
Uptime                      2 hours, 38 minutes, 26 seconds
Slot 2 information:
State                       Online
Temperature                 48 (C)
Total CPU DRAM              2048 MB
Total SRAM                  403 MB
Total SDRAM                 1316 MB
Start time                  2015-02-27 03:05:55 PST
Uptime                      2 hours, 38 minutes, 26 seconds

```

show chassis fpc pic-status (MX104-40G Router)

MIC slots 1/0 and 1/1 have been disabled by default on the MX104-40G routers. If you install MICs on those slots, the MIC details are displayed when you run the **show chassis fpc pic-status** command. However, the status of the MIC is displayed as offline.

```

user@host> show chassis fpc pic-status
Slot 0  Online
  PIC 0  Online      MS-MIC-16G
  PIC 2  Online      10x 1GE(LAN) SFP
  PIC 3  Online      10x 1GE(LAN) SFP
Slot 1  Online
  PIC 0  Offline     10x 1GE(LAN) SFP
  PIC 1  Offline     10x 1GE(LAN) SFP
Slot 2  Online
  PIC 0  Online      4x 10GE(LAN) SFP+

```

show chassis fpc pic-status (MX104-40G Router with Upgrade License)

When you install the upgrade license on MX104-40G, MIC slots 1/0 and 1/1 are enabled. If you install MICs on those slots, the MIC details are displayed and the status of the MIC is displayed as online when you run the **show chassis fpc pic-status** command.

```

user@host> show chassis fpc pic-status
Slot 0  Online
  PIC 0  Online      MS-MIC-16G
  PIC 2  Online      10x 1GE(LAN) SFP
  PIC 3  Online      10x 1GE(LAN) SFP
Slot 1  Online
  PIC 0  Online      10x 1GE(LAN) SFP
  PIC 1  Online      10x 1GE(LAN) 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	DRAM (MB)	Heap
0	Empty		Interrupt		Buffer

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 (C)	CPU Utilization (%)		Memory DRAM (MB)	Utilization (%)	
			Total	Interrupt		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 RDRAM	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 RDRAM	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
```

Slot	State	Temp (C)	CPU Utilization (%)		CPU Utilization (%)			Memory DRAM (MB)
			Total	Interrupt	1min	5min	15min	
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
```

Slot	State	Temp (C)	CPU Utilization (%)		Memory DRAM (MB)	Utilization (%)	
			Total	Interrupt		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 (%)	Buffer
State	(C)	Total	Interrupt	DRAM (MB) Heap	
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 (C)	CPU Utilization (%)	Memory Utilization (%)	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 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)	CPU Utilization (%)	Memory Utilization (%)	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						

```

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)	CPU Total	Utilization (%) Interrupt	Memory DRAM (MB)	Utilization (%) Heap	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 RLDRAM	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 RLDRAM	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 RLD RAM                       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, and MX2020 3D Universal Edge Routers Configured for 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

```

Slot	State	Temp (C)	CPU Utilization (%)	Memory Interrupt	Utilization (%)	DRAM (MB)	Heap	Buffer
0	Online	34	9	0	0	2048	18	13
1	Online	32	9	0	0	2048	15	13
2	Empty							
3	Empty							
4	Empty							
5	Empty							
6	Empty							
7	Empty							
8	Online	31	13	0	0	2048	11	13
9	Online	33	10	0	0	2048	18	13

show chassis fpc (MX2020 Routers)

```

user@host> show chassis fpc

```

Slot	State	Temp (C)	CPU Utilization (%)	Memory Interrupt	Utilization (%)	DRAM (MB)	Heap	Buffer
0	Online	10	12	0	0	2048	18	13
1	Online	8	9	0	0	2048	18	13
2	Online	7	9	0	0	2048	18	13
3	Online	8	10	0	0	2048	18	13
4	Online	9	10	0	0	2048	18	13
5	Online	8	9	0	0	2048	18	13
6	Online	8	10	0	0	2048	18	13
7	Online	9	9	0	0	2048	18	13
8	Online	9	10	0	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> show chassis fpc

```

Slot	State	Temp (C)	CPU Utilization (%)	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 detail (MX2020 Router with MPC4E)

```

user@host> show chassis fpc detail

```

Slot 0 information:

State	Online
Temperature	34
Total CPU DRAM	2048 MB
Total RLDRAM	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 RLDRAM	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 RDRAM                              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 RDRAM                              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 RDRAM                              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> show chassis fpc

```

Slot	State	Temp (C)	CPU Utilization (%)	Memory Utilization (%)	DRAM (MB)	Heap	Buffer
			Total	Interrupt			
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 MPCEQ and MPC6E)

```

user@host> 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 RLD RAM                 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 RLD RAM                 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 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 RLDRAM 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 RLDRAM 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 RLDRAM 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 (Hardware Not Supported)

```

user@host> show chassis fpc
show chassis fpc
Temp CPU Utilization (%) Memory Utilization (%)

```

Slot	State	(C)	Total	Interrupt	DRAM (MB)	Heap	Buffer
0	Online	-----		CPU less FPC	-----		
1	Present	-----	Hardware Not	In Right Slot	-----		
2	Online		0	0	0	0	0
3	Present	-----	Hardware Not	Supported	-----		
4	Empty						
5	Empty						
6	Online		0	0	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	Utilization (%) Interrupt	Memory Utilization (%) DRAM (MB) 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 (%) Total Interrupt	Memory DRAM (MB)	Utilization (%) 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 (%) Total Interrupt	Memory DRAM (MB)	Utilization (%) 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 (%) Total Interrupt	Memory DRAM (MB)	Utilization (%) 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 (%) Total Interrupt	Memory DRAM (MB)	Utilization (%) 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
```

```
lcc0-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  CPU Utilization (%)  Memory  Utilization (%)
              (C) Total  Interrupt  DRAM (MB) 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  CPU Utilization (%)  Memory  Utilization (%)
              (C) Total  Interrupt  DRAM (MB) 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 (%)	Memory Utilization (%)
			Total Interrupt	DRAM (MB) 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)

```

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 Switch)

```

user@switch> show chassis fpc interconnect-device interconnect1
FPC status:
Temp
Slot State      (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 Switch)

```
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 Switch)

```
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 Switch)

```
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 Switch)

```

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 Switch)

```

user@host> show chassis fpc

```

Slot	State	Temp (C)	CPU Total	Utilization (%) Interrupt	Memory DRAM (MB)	Utilization (%) Heap	Utilization (%) 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 Switch)

```

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 Switch)

```

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 (ACX2000 Universal Access 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 Access 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 Access 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 Access 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 (%) Total Interrupt	Memory DRAM (MB)	Utilization (%) 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

```

show chassis fpc errors

Syntax show chassis fpc errors;

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.

Description Display chassis error information including FPC number, severity of error, 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.

Required Privilege Level view

Related Documentation

- [fpc error on page 574](#)

List of Sample Output [show chassis fpc errors on page 1363](#)
[show chassis fpc errors \(MX480 Router\) on page 1363](#)

Output Fields [Table 98 on page 1362](#) lists the output fields for the **show chassis fpc errors** command. Output fields are listed in the approximate order in which they appear.

Table 98: 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"> • fatal—Fatal error on FPC • major—Major error on FPC • minor—Minor error on FPC
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.

Table 98: show chassis fpc errors Output Fields (*continued*)

Field Name	Field Description
Action	The detection and recovery actions that are triggered when the threshold value is crossed. <ul style="list-style-type: none"> Restart the FPC. Get the current state of the FPC and raise an alarm. Write a log for the event.

Sample Output

show chassis fpc errors

```

user@host> show chassis fpc errors
FPC  Level  Occurred  Cleared  Threshold  Action-Taken  Action
0    Minor   0          0        10         LOG|
      Major   0          0         1        GET STATE|ALARM|
      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 |
1    Minor   0          0        10         LOG|
      Major   0          0         1        GET STATE|ALARM|
      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 |
2    Minor   0          0        10         LOG|
      Major   0          0         1        GET STATE|ALARM|
      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 |
4    Minor   0          0        10         LOG|
      Major   0          0         1        GET STATE|ALARM|
      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 |
5    Minor   0          0        10         LOG|
      Major   0          0         1        GET STATE|ALARM|
      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 |
6    Minor   0          0        10         LOG|
      Major   0          0         1        GET STATE|ALARM|
      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 |
7    Minor   0          0        10         LOG|
      Major   0          0         1        GET STATE|ALARM|
      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 |

```

show chassis fpc errors (MX480 Router)

```

user@host> show chassis fpc errors
FPC  Level  Occured  Cleared  Threshold  Action-Taken  Action
1    Minor   0          0        10         0  LOG|
      Major   0          0         1         0  GET STATE|CM ALARM|
      Fatal   0          0         1         0  RESET

```

2	Minor	0	0	10	0 LOG|
	Major	0	0	1	0 GET_STATE|CM_ALARM|
	Fatal	0	0	1	0 RESET
3	Minor	0	0	10	0 LOG|
	Major	0	0	1	0 GET_STATE|CM_ALARM|
	Fatal	0	0	1	0 RESET
4	Minor	0	0	10	0 LOG|
	Major	0	0	1	0 GET_STATE|CM_ALARM|
	Fatal	0	0	1	0 RESET
5	Minor	0	0	10	0 LOG|
	Major	0	0	1	0 GET_STATE|CM_ALARM|
	Fatal	0	0	1	0 RESET

show chassis fpc-feb-connectivity

Syntax	show chassis fpc-feb-connectivity
Release Information	Command introduced in Junos OS Release 8.0.
Description	(M120 router only) Display the Flexible PIC Concentrator (FPC) and Forwarding Engine Board (FEB) mapping and their respective states.
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • request chassis fpc on page 725 • show chassis fpc on page 1322 • show chassis fabric fpcs on page 1125 • Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 333 • MX960 Flexible PIC Concentrator Description
List of Sample Output	show chassis fpc-feb-connectivity on page 1366
Output Fields	Table 99 on page 1365 lists the output fields for the show chassis fpc-feb-connectivity command. Output fields are listed in the approximate order in which they appear.

Table 99: 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: Type 1 , Type 2 , Type 3 , or cFPC .
FPC state	<p>State of the FPC. State can be any of the following:</p> <ul style="list-style-type: none"> • Announce offline—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. • Announce online—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. • Empty—No FPC is present. • Offline—FPC is powered down. • Online—FPC is online and running. • Present—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. • Ready—FPC is in transition state.
Connected FEB	Slot number of the Forwarding Engine Board (FEB) connected to the FPC or None if the FPC is not connected to a FEB.

Table 99: show chassis fpc-feb-connectivity Output Fields (*continued*)

Field Name	Field Description
FEB state	<p>State of the FEB. State can be any of the following:</p> <ul style="list-style-type: none"> • Announce offline—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. • Announce online—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. • Empty—No FEB is present. • Offline—FEB is powered down. • Online—FEB is online and running. • Present—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. • Ready—FEB is in transition state.
Link status	<p>Status of the link connecting the R-FEB and R-FPC:</p> <ul style="list-style-type: none"> • Error • Misconfiguration—Configuration between the R-FEB and the F-FPC is incorrect. • OK

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 1368 Syntax (EX Series) on page 1368 Syntax (T4000 Router) on page 1368 Syntax (TX Matrix Router) on page 1368 Syntax (TX Matrix Plus Router) on page 1368 Syntax (MX Series Routers) on page 1368 Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers) on page 1368 Syntax (QFX Series) on page 1369 Syntax (OCX Series) on page 1369 Syntax (PTX Series Packet Transport Routers) on page 1369 Syntax (ACX Series Universal Access Routers) on page 1369
Syntax	<code>show chassis hardware</code> <code><detail | extensive></code> <code><clei-models></code> <code><models></code>
Syntax (EX Series)	<code>show chassis hardware</code> <code><clei-models></code> <code><detail | extensive></code> <code><models></code> <code><satellite [slot-id <i>slot-id</i> | device-alias <i>alias-name</i>]></code>
Syntax (T4000 Router)	<code>show chassis hardware</code> <code><clei-models></code> <code><detail | extensive></code> <code><models></code>
Syntax (TX Matrix Router)	<code>show chassis hardware</code> <code><clei-models></code> <code><detail | extensive></code> <code><models></code> <code><lcc <i>number</i> | scc></code>
Syntax (TX Matrix Plus Router)	<code>show chassis hardware</code> <code><clei-models></code> <code><detail | extensive></code> <code><models></code> <code><lcc <i>number</i> | sfc <i>number</i>></code>
Syntax (MX Series Routers)	<code>show chassis hardware</code> <code><detail | extensive></code> <code><clei-models></code> <code><models></code> <code><all-members></code> <code><local></code> <code><member <i>member-id</i>></code>
Syntax (MX104, MX2010, and MX2020)	<code>show chassis hardware</code> <code><clei-models></code>

3D Universal Edge Routers)	<detail | extensive> <models> <satellite [slot-id <i>slot-id</i> | device-alias <i>alias-name</i>]>
Syntax (QFX Series)	show chassis hardware <detail | extensive> <clei-models> <interconnect-device <i>name</i> > <node-device <i>name</i> > <models>
Syntax (OCX Series)	show chassis hardware <detail | extensive> <clei-models> <models>
Syntax (PTX Series Packet Transport Routers)	show chassis hardware <detail | extensive> <clei-models> <models>
Syntax (ACX Series Universal Access Routers)	show chassis hardware <detail | extensive> <clei-models> <models>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>models option introduced in Junos OS Release 8.2.</p> <p>Command introduced in Junos OS Release 9.0 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 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 Access Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> <p>satellite option introduced in Junos OS Release 14.2R3.</p>
Description	<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"> On EX2200 switches, EX3200 switches, EX4200 standalone switches, and EX4500 switches—Refers to the switch; FPC <i>number</i> is always 0. 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. On EX8208 and EX8216 switches—Refers to a line card; FPC <i>number</i> equals the slot number for the line card.

On QFX3500, QFX5100, OCX Series standalone switches, and PTX1000 routers, both the FPC and FPC *number* are always 0.

On T4000 Type 5 FPCs, there are no **top temperature sensor** or **bottom temperature sensor** parameters. Instead, **fan intake temperature sensor** and **fan exhaust temperature sensors** parameters are displayed.

Starting from Junos OS Release 11.4, the output of the **show chassis hardware models** 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 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:

Table 100: 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.

Required Privilege Level view

Related Documentation	<ul style="list-style-type: none">• show chassis power on page 1587
List of Sample Output	<ul style="list-style-type: none">• show chassis hardware (EX8216 Switch) on page 1378• show chassis hardware clei-models (EX8216 Switch) on page 1379• show chassis hardware clei-models (T1600 Router) on page 1380• show chassis hardware (EX2300-C Switch) on page 1381• show chassis hardware (EX2300 Switch) on page 1381• show chassis hardware detail (EX4200 Switch) on page 1381• show chassis hardware (EX4300 Switch) on page 1381• show chassis hardware models (EX4500 Switch) on page 1382• show chassis hardware detail (EX9200 Switch) on page 1382• show chassis hardware (M7i Router) on page 1383• show chassis hardware (M10 Router) on page 1383• show chassis hardware models (M10 Router) on page 1384• show chassis hardware (M20 Router) on page 1384• show chassis hardware models (M20 Router) on page 1385• show chassis hardware (M40 Router) on page 1385• show chassis hardware (M40e Router) on page 1386• show chassis hardware (M120 Router) on page 1386• show chassis hardware detail (M120 Router) on page 1387• show chassis hardware models (M120 Router) on page 1388• show chassis hardware (M160 Router) on page 1389• show chassis hardware models (M160 Router) on page 1389• show chassis hardware detail (M160 Router) on page 1390• show chassis hardware (M320 Router) on page 1391• show chassis hardware models (M320 Router) on page 1392• show chassis hardware (MX5 Router) on page 1393• show chassis hardware (MX10 Router) on page 1393• show chassis hardware (MX40 Router) on page 1394• show chassis hardware (Fixed MX80 Router) on page 1394• show chassis hardware (Modular MX80 Router) on page 1395• show chassis hardware (MX104 Router) on page 1395• show chassis hardware detail (MX104 Router) on page 1396• show chassis hardware extensive (MX104 Router) on page 1396• show chassis hardware models (MX104 Router) on page 1400• show chassis hardware clei-models (MX104 Router) on page 1400• show chassis hardware (MX240 Router) on page 1400• show chassis hardware detail (MX 240 Router with Routing Engine Displaying DIMM Information) on page 1401• show chassis hardware (MX240 Router with Enhanced MX SCB) on page 1401• show chassis hardware (MX480 Router) on page 1402• show chassis hardware (MX480 Router with Enhanced MX SCB) on page 1402• show chassis hardware (MX480 Routers with MPC5E and Built-in OTN PIC) on page 1403• show chassis hardware detail (MX480 Routers with MPC5E and Built-in OTN PIC) on page 1404• show chassis hardware extensive (MX480 Routers with MPC5E and Built-in OTN PIC) on page 1406• show chassis hardware (MX960 Router) on page 1409

[show chassis hardware \(MX960 Router with Bidirectional Optics\) on page 1409](#)
[show chassis hardware \(MX960 Router with Enhanced MX SCB\) on page 1410](#)
[show chassis hardware models \(MX960 Router with Enhanced MX SCB\) on page 1412](#)
[show chassis hardware \(MX960 Router with MPC5EQ\) on page 1412](#)
[show chassis hardware detail \(MX960 Router\) on page 1415](#)
[show chassis hardware detail \(MX960 Router with MPC5EQ\) on page 1416](#)
[show chassis hardware extensive \(MX960 Router with MPC5EQ\) on page 1419](#)
[show chassis hardware models \(MX960 Router with MPC5EQ\) on page 1427](#)
[show chassis hardware clei-models \(MX960 Router with MPC5EQ\) on page 1428](#)
[show chassis hardware \(MX960 Router with MPC3E and 100-Gigabit DWDM OTN MIC\) on page 1428](#)
[show chassis hardware clei-models \(MX960 Router with MPC3E and 100-Gigabit DWDM OTN MIC\) on page 1429](#)
[show chassis hardware \(PTX3000 Router with 5-port 100-Gigabit DWDM OTN PIC\) on page 1430](#)
[show chassis hardware clei-models \(PTX3000 Router with 5-port 100-Gigabit DWDM OTN PIC\) on page 1430](#)
[show chassis hardware \(MX2010 Router\) on page 1431](#)
[show chassis hardware detail \(MX2010 Router\) on page 1433](#)
[show chassis hardware extensive \(MX2010 Router\) on page 1438](#)
[show chassis hardware models \(MX2010 Router\) on page 1443](#)
[show chassis hardware clei-models \(MX2010 Routers\) on page 1444](#)
[show chassis hardware \(MX2010 Routers with MPC6E and OTN MIC\) on page 1445](#)
[show chassis hardware detail \(MX2010 Routers with MPC6E and OTN MIC\) on page 1447](#)
[show chassis hardware extensive \(MX2010 Routers with MPC6E and OTN MIC\) on page 1448](#)
[show chassis hardware \(MX2020 Router\) on page 1453](#)
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[show chassis hardware models \(MX2020 Router\) on page 1471](#)
[show chassis hardware clei-models \(MX2020 Router\) on page 1472](#)
[show chassis hardware \(MX2020 Router with MPC5EQ and MPC6E\) on page 1473](#)
[show chassis hardware detail \(MX2020 Router with MPC5EQ and MPC6E\) on page 1478](#)
[show chassis hardware extensive \(MX2020 Router with MPC5EQ and MPC6E\) on page 1479](#)
[show chassis hardware models \(MX2020 Routers with MPC5EQ and MPC6E\) on page 1485](#)
[show chassis hardware clei-models \(MX2020 Router with MPC5EQ and MPC6E\) on page 1486](#)
[show chassis hardware \(MX Series routers with ATM MIC\) on page 1487](#)
[show chassis hardware \(MX240, MX480, MX960 routers with Application Services Modular Line Card\) on page 1488](#)
[show chassis hardware extensive \(MX240, MX480, MX960 Routers with Application Services Modular Line Card\) on page 1488](#)
[show chassis hardware \(MX480 Router with MPC4E\) on page 1489](#)
[show chassis hardware \(MX2020 Router with MPC4E\) on page 1490](#)
[show chassis hardware \(MX5, MX10, MX40, MX80, MX240, MX480, and MX960 Routers with Enhanced 20-Port Gigabit Ethernet MIC\) on page 1492](#)
[show chassis hardware models \(MX5, MX10, MX40, MX80, MX240, MX480, and MX960 Routers with Enhanced 20-Port Gigabit Ethernet MIC\) on page 1493](#)

[show chassis hardware \(T320 Router\) on page 1493](#)
[show chassis hardware \(T640 Router\) on page 1494](#)
[show chassis hardware models \(T640 Router\) on page 1495](#)
[show chassis hardware extensive \(T640 Router\) on page 1495](#)
[show chassis hardware \(T4000 Router\) on page 1496](#)
[show chassis hardware \(T4000 Router with 16-GB Line Card Chassis \(LCC\) Routing Engine\) on page 1498](#)
[show chassis hardware \(T4000 Router with LSR FPC\) on page 1498](#)
[show chassis hardware clei-models \(T4000 Router\) on page 1499](#)
[show chassis hardware detail \(T4000 Router\) on page 1499](#)
[show chassis hardware models \(T4000 Router\) on page 1501](#)
[show chassis hardware lcc \(TX Matrix Router\) on page 1502](#)
[show chassis hardware scc \(TX Matrix Router\) on page 1502](#)
[show chassis hardware \(T1600 Router\) on page 1503](#)
[show chassis hardware \(TX Matrix Plus Router\) on page 1505](#)
[show chassis hardware sfc \(TX Matrix Plus Router\) on page 1510](#)
[show chassis hardware extensive \(TX Matrix Plus Router\) on page 1511](#)
[show chassis hardware clei-models \(TX Matrix Plus Router\) on page 1512](#)
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[show chassis hardware \(TX Matrix Plus Router with 3D SIBs\) on page 1519](#)
[show chassis hardware clei-models \(TX Matrix Plus Router with 3D SIBs\) on page 1523](#)
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[show chassis hardware \(16-Port 10-Gigabit Ethernet MPC with SFP+ Optics \[MX Series Routers\]\) on page 1532](#)
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[show chassis hardware detail \(QFX3500 Switches\) on page 1534](#)
[show chassis hardware models \(QFX3500 Switches\) on page 1536](#)
[show chassis hardware clei-models \(QFX3500 Switches\) on page 1536](#)
[show chassis hardware clei-models \(QFX5100 Switches\) on page 1536](#)
[show chassis hardware interconnect-device \(QFabric Systems\) on page 1536](#)
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[show chassis hardware \(PTX3000 Packet Transport Router with the IPLC module\) on page 1536](#)
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[show chassis hardware \(QFX3500 Switch running Enhanced Layer 2 Software\) on page 1548](#)
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Output Fields [Table 101 on page 1376](#) lists the output fields for the **show chassis hardware** command. Output fields are listed in the approximate order in which they appear.

Table 101: show chassis hardware Output Fields

Field Name	Field Description	Level of Output
Item	<p>Chassis component:</p> <ul style="list-style-type: none"> (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. See <i>EX Series Switches Hardware and CLI Terminology Mapping</i>. (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). (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. (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. (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). (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). (MX2010 and MX2020 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. 	All levels
Version	Revision level of the chassis component.	All levels
Part number	Part number of the chassis component.	All levels
Serial number	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

Table 101: show chassis hardware Output Fields (*continued*)

Field Name	Field Description	Level of Output
Assb ID or Assembly ID	(extensive keyword only) Identification number that describes the FRU hardware.	extensive
Assembly Version	(extensive keyword only) Version number of the FRU hardware.	extensive
Assembly Flags	(extensive keyword only) Flags.	extensive
FRU model number	(clei-models , extensive , and models keyword only) Model number of the FRU hardware component.	none specified
CLEI code	(clei-models and extensive 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
EEPROM Version	ID EEPROM version used by the hardware component: 0x00 (version 0), 0x01 (version 1), or 0x02 (version 2).	extensive
Description	<p>Brief description of the hardware item:</p> <ul style="list-style-type: none"> • Type of power supply. • Type of PIC. If the PIC type is not supported on the current software release, the output states Hardware Not Supported. • Type of FPC: FPC Type 1, FPC Type 2, FPC Type 3, FPC Type 4, or FPC TypeOC192. <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"> • 2x FE—Either two built-in Fast Ethernet interfaces (fixed PIM) or dual-port Fast Ethernet PIM • 4x FE—4-port Fast Ethernet ePIM • 1x GE Copper—Copper Gigabit Ethernet ePIM (one 10-Mbps, 100-Mbps, or 1000-Mbps port) • 1x GE SFP—SFP Gigabit Ethernet ePIM (one fiber port) • 2x Serial—Dual-port serial PIM • 2x T1—Dual-port T1 PIM • 2x E1—Dual-port E1 PIM • 2x CT1E1—Dual-port channelized T1/E1 PIM • 1x T3—T3 PIM (one port) • 1x E3—E3 PIM (one port) • 4x BRI S/T—4-port ISDN BRI S/T PIM • 4x BRI U—4-port ISDN BRI U PIM • 1x ADSL Annex A—ADSL 2/2+ Annex A PIM (one port, for POTS) • 1x ADSL Annex B—ADSL 2/2+ Annex B PIM (one port, for ISDN) • 2x SHDSL (ATM)—G SHDSL PIM (2-port two-wire module or 1-port four-wire module) 	All levels

Table 101: show chassis hardware Output Fields (*continued*)

Field Name	Field Description	Level of Output
	<ul style="list-style-type: none"> • 1x TGM550—TGM550 Telephony Gateway Module (Avaya VoIP gateway module with one console port, two analog LINE ports, and two analog TRUNK ports) • 1x DS1 TIM510—TIM510 E1/T1 Telephony Interface Module (Avaya VoIP media module with one E1 or T1 trunk termination port and ISDN PRI backup) • 4x FXS, 4x FXO, TIM514—TIM514 Analog Telephony Interface Module (Avaya VoIP media module with four analog LINE ports and four analog TRUNK ports) • 4x BRI TIM521—TIM521 BRI Telephony Interface Module (Avaya VoIP media module with four ISDN BRI ports) • Crypto Accelerator Module—For enhanced performance of cryptographic algorithms used in IP Security (IPsec) services • MPC M16x10GE—16-port 10-Gigabit Module Port Concentrator that supports SFP+ optical transceivers. (Not on EX Series switches.) • For hosts, the Routing Engine type. • For small form-factor pluggable transceiver (SFP) modules, the type of fiber: LX, SX, LH, or T. • LCD description for EX Series switches (except EX2200 switches). • MPC2—1-port MPC2 that supports two separate slots for MICs. • MPC3E—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. • 100GBASE-LR4, pluggable CFP optics • Supports the Enhanced MX Switch Control Board with fabric redundancy and existing SCBs without fabric redundancy. • Interoperates with existing MX Series line cards, including Flexible Port Concentrators (FPC), Dense Port Concentrators (DPCs), and Modular Port Concentrators (MPCs). • MPC4E—Fixed configuration MPC4E that is available in two flavors: MPC4E-3D-32XGE-SFP and MPC4E-3D-2CGE-8XGE on MX2020, MX960, MX480, and MX240 routers. • LCD description for MX Series routers 	

Sample Output

show chassis hardware (EX8216 Switch)

```

user@host> show chassis hardware
Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis       REV 06   710-016845   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-1CHOC12SMIR-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-SON-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 (EX2300-C Switch)

```
user@switch> show chassis hardware
Hardware inventory:
Item              Version  Part number  Serial number  Description
Chassis
Pseudo CB 0
Routing Engine 0
FPC 0             REV 04    650-059984   HV0215410003   EX2300-C-12P
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
Pseudo CB 0
Routing Engine 0
FPC 0             REV 05    650-059968   JY0215410033   EX2300-24P
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
JPSU-450W-AC-AFO
Fan Tray 0
(AFO)
Fan Tray 1
(AFO)
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
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
PIC 0            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 Module, Airflow Out
Fan Tray 1 (AF0)				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 (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
Midplane
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
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
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	HTE541040G9SA00	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-40C3-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)

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user@host> 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> 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	S00076	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> 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      BUILTIN       Routing Engine
TFEB 0            BUILTIN   BUILTIN      BUILTIN       Forwarding Engine
Processor
  QXM 0           REV 05    711-028408   ZA9136        MPC QXM
  FPC 0            BUILTIN   BUILTIN      BUILTIN       MPC BUILTIN
  MIC 0            BUILTIN   BUILTIN      BUILTIN       4x 10GE XFP
  PIC 0            BUILTIN   BUILTIN      BUILTIN       4x 10GE XFP
  FPC 1            BUILTIN   BUILTIN      BUILTIN       MPC BUILTIN
  MIC 0           REV 24    750-028392   YX9820        3D 20x 1GE(LAN) SFP
  PIC 0            BUILTIN   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      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   P9POXV3       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   P9MOU37       SFP-SX
  MIC 1           REV 20    750-028380   ZG2657        3D 2x 10GE XFP
  PIC 2            BUILTIN   BUILTIN      BUILTIN       1x 10GE XFP
  PIC 3            BUILTIN   BUILTIN      BUILTIN       1x 10GE XFP
Fan Tray

```

show chassis hardware (MX10 Router)

```

user@host> 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      BUILTIN       Routing Engine
TFEB 0            BUILTIN   BUILTIN      BUILTIN       Forwarding Engine
Processor
  QXM 0           REV 05    711-028408   ZA9053        MPC QXM
  FPC 0            BUILTIN   BUILTIN      BUILTIN       MPC BUILTIN
  MIC 0            BUILTIN   BUILTIN      BUILTIN       4x 10GE XFP
  PIC 0            BUILTIN   BUILTIN      BUILTIN       4x 10GE XFP
  FPC 1            BUILTIN   BUILTIN      BUILTIN       MPC BUILTIN
  MIC 0           REV 24    750-028392   YX9436        3D 20x 1GE(LAN) SFP
  PIC 0            BUILTIN   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

```

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                               MX80
PEM 0                               AC Power Entry Module
Routing Engine                               Routing Engine
FEB 0                               Forwarding Engine Board

QXM 0          REV 05  711-028408  JR7041  MPC QXM
FPC 0                               MPC BUILTIN
MIC 0                               4x 10GE XFP
PIC 0                               4x 10GE XFP
FPC 1                               MPC BUILTIN
MIC 0          REV 02  750-028380  JR6598  3D 2x 10GE XFP
PIC 0                               1x 10GE XFP
Xcvr 0         REV 01  740-014289  T07M86365 XFP-10G-SR
PIC 1                               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                               1x 10GE XFP
Xcvr 0         REV 02  740-014289  T08L86302 XFP-10G-SR
PIC 3                               1x 10GE XFP
Xcvr 0         REV 02  740-014289  C810XU0BA XFP-10G-SR
Fan Tray                               Fan Tray
```

show chassis hardware (MX104 Router)

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

```
Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis                               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                               Forwarding Engine
Processor
FPC 0                               MPC BUILTIN
FPC 1                               MPC BUILTIN
MIC 0             REV 15  750-036132  CAAF7948  2x0C12/8x0C3 CC-CE
PIC 0                               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      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
  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
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 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

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 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
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 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 41 30 30 ff 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 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 41 30 30 ff 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 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
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    PCQOU2J      SFP-IR
Xcvr 1        REV 01      740-016068    P3L7A6G      SFP-SR
Xcvr 2        REV 01      740-016068    P3L7A5J      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    PBK0NK3      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 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

```

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           BUILTIN  BUILTIN
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 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  BUILTIN
FPC 0            BUILTIN  BUILTIN
FPC 1            BUILTIN  BUILTIN
MIC 0            REV 01   750-046905   PROTOXCLEI     MIC-3D-20GE-SFP-EH
FPC 2            BUILTIN  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			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 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	RMPD 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	AJ40J0J	SFP+-10G-SR
PIC 3		BUILTIN	BUILTIN	1X100GE CFP2 OTN
Xcvr 0		NON-JNPR	UQC0B53	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 QSFP
PIC 3		BUILTIN	BUILTIN	3X40GE QSFP
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 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 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 ANAOND0 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 UQC0B53 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 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 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 QSFP
PIC 3		BUILTIN	BUILTIN	3X40GE QSFP
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 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
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

```

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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 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    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 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 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 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 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 00
Address 0x70: 00 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 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 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 00
Address 0x70: 00 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 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 00
Address 0x70: 00 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 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 31 36 00 00
Address 0x20: 39 30 30 39 30 39 37 39 35 38 00 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

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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

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show chassis hardware (MX960 Router)

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user@host> show chassis hardware
Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis                               MX960
Midplane                               MX960 Midplane
PIM                               Power Inlet Module
PEM 2
PEM 3                               PS 1.7kW; 200-240VAC in
Routing Engine 0 REV 00    740-015113   1000617944    RE-S-1300
CB 0                               MX960 Test SCB
FPC 4                               MX960 Test DPC
CPU
PIC 0                               1x 10GE (LAN/WAN)
PIC 1                               10x 1GE
FPC 7                               MX960 Test DPC
CPU
PIC 0                               1x 10GE (LAN/WAN)
Xcvr 0                               XFP-10G-SR
PIC 1                               10x 1GE
Xcvr 1                               SFP-SX
Xcvr 4                               SFP-SX
Xcvr 6                               SFP-SX
Xcvr 9                               SFP-SX
Fan Tray 0
Fan Tray 1

```

show chassis hardware (MX960 Router with Bidirectional Optics)

```

user@host> show chassis hardware
Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis                               MX960
Midplane                               MX960 Backplane
FPM Board                               Front Panel Display
PDM                               Power Distribution Module
PEM 0                               PS 1.7kW; 200-240VAC in
PEM 1                               PS 1.7kW; 200-240VAC in
PEM 2                               PS 1.7kW; 200-240VAC in
Routing Engine 0 REV 06    740-013063   1000691458    RE-S-2000
CB 0                               MX SCB
CB 1                               MX SCB
FPC 3                               DPCE 40x 1GE R
CPU
FPC 4                               DPCE 40x 1GE R
CPU                               DPC PMB
PIC 0                               10x 1GE (LAN)
Xcvr 1                               SFP-1000BASE-BX40-D
Xcvr 2                               SFP-1000BASE-BX40-D
Xcvr 5                               SFP-1000BASE-BX10-U
Xcvr 6                               SFP-1000BASE-BX40-U
Xcvr 8                               SFP-1000BASE-BX40-U
PIC 1                               10x 1GE (LAN)
Xcvr 0                               SFP-1000BASE-BX10-D

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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> 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	P9P0XXH	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	Rev 10	740-027760	QCS1702N062	PS 4.1kW; 200-240V AC
PEM 1	Rev 04	740-027760	QCS1422N02C	PS 4.1kW; 200-240V AC
PEM 2	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	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	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	AQG0M1E	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	RMPD 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	HMPD 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	RMPD 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	QSFPP+-40G-SR4
Xcvr 1	REV 01	740-046565	QC480274	QSFPP+-40G-SR4
Xcvr 2	REV 01	740-046565	QD130190	QSFPP+-40G-SR4
PIC 3		BUILTIN	BUILTIN	3X40GE QSFPP
Xcvr 0	REV 01	740-046565	QD130197	QSFPP+-40G-SR4
Xcvr 1	REV 01	740-046565	QD130180	QSFPP+-40G-SR4
Xcvr 2	REV 01	740-046565	QD130199	QSFPP+-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	RMPD 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)

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user@host> show chassis hardware detail
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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	NROWT5925N77	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)

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user@host> show chassis hardware detail
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Hardware inventory:
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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	RMPC PMB
PIC 0		BUILTIN	BUILTIN	2X10GE SFPP OTN
Xcvr 0	REV 01	740-021308	AQA0DYT	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	ANA0NAJ	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	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	RMPM PMB
PIC 0		BUILTIN	BUILTIN	2X10GE SFPP OTN
Xcvr 0	REV 01	740-021308	AQA095A	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQG0M1E	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	AQG0LYC	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQG0LYB	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	RMPM PMB
PIC 0		BUILTIN	BUILTIN	2X10GE SFPP OTN
Xcvr 0	REV 01	740-021308	AQG0MXE	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQG0LVY	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	AQG0LW1	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQG0LW3	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	HMPM PMB 2G
PIC 0		BUILTIN	BUILTIN	4x10GE SFPP
Xcvr 0	REV 01	740-021308	ANA0MM3	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	AQG0MS6	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQG0MRX	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	RMPD 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	RMPD 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 extensive (MX960 Router with MPC5EQ)

```

user@host> show chassis hardware extensive
Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis
Jedec Code:   0x7fb0          EEPROM Version: 0x02
S/N:          JN1214852AFA
Assembly ID:  0x0512          Assembly Version: 00.00
Date:         00-00-0000      Assembly Flags:  0x00
ID: MX960
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 12 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 31 34 38 35 32 41 46 41 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 01  710-030012  ACAX3674      MX960 Backplane
Jedec Code:   0x7fb0          EEPROM Version: 0x02
P/N:          710-030012      S/N:          ACAX3674
Assembly ID:  0x01df          Assembly Version: 01.01
Date:         01-19-2013      Assembly Flags: 0x00
Version:      REV 01          CLEI Code:    COM8T00CRB
ID: MX960 Backplane          FRU Model Number: CHAS-BP-MX960-S
Board Information Record:
Address 0x00: ad 01 08 00 54 e0 32 bc 68 00 ff ff ff ff ff ff
I2C Hex Data:
Address 0x00: 7f b0 02 ff 01 df 01 01 52 45 56 20 30 31 00 00
Address 0x10: 00 00 00 00 37 31 30 2d 30 33 30 30 31 32 00 00
Address 0x20: 53 2f 4e 20 41 43 41 58 33 36 37 34 00 13 01 07
Address 0x30: dd ff ff ff ad 01 08 00 54 e0 32 bc 68 00 ff ff
Address 0x40: ff ff ff ff 01 43 4f 4d 38 54 30 30 43 52 42 43
Address 0x50: 48 41 53 2d 42 50 2d 4d 58 39 36 30 2d 53 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 aa ff ff ff ff ff ff ff ff ff ff ff ff
FPM Board     REV 03  710-014974  CAAZ9326      Front Panel Display
Jedec Code:   0x7fb0          EEPROM Version: 0x01
P/N:          710-014974      S/N:          CAAZ9326
Assembly ID:  0x01e6          Assembly Version: 01.03
Date:         12-31-2012      Assembly Flags: 0x00
Version:      REV 03

```

```

ID: Front Panel Display          FRU Model Number: CRAFT-MX960-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 e6 01 03 52 45 56 20 30 33 00 00
  Address 0x10: 00 00 00 00 37 31 30 2d 30 31 34 39 37 34 00 00
  Address 0x20: 53 2f 4e 20 43 41 41 5a 39 33 32 36 00 1f 0c 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 00 00 00 00 00 00 00 00 00 00 43
  Address 0x50: 52 41 46 54 2d 4d 58 39 36 30 2d 53 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
PDM          Rev 03  740-013110  QCS17025017  Power Distribution Module
Jedec Code:  0x7fb0          EEPROM Version:  0x01
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 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 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
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

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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
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
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 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 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 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 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 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 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 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 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 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 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      ANAONAJ      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
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
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
Address 0x70: ff ff ff cf ff 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 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 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 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 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

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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
  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 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

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```

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

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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	HMPCE PMB 2G
MIC 0	REV 19	750-033199	CAAE5870	1X100GE CFP
PIC 0		BUILTIN	BUILTIN	1X100GE CFP
Xcvr 0	REV 01	740-032210	UTHOHOW	CFP-100G-LR4
FPC 2	REV 14	750-045372	CADN3262	MPCE Type 3 3D
CPU	REV 10	711-035209	CADN8129	HMPCE PMB 2G
FPC 3	REV 14	750-045372	CADH0146	MPCE Type 3 3D
CPU	REV 10	711-035209	CADT2458	HMPCE 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	HMPCE PMB 2G
FPC 7	REV 14	750-045372	CADJ1947	MPCE Type 3 3D
CPU	REV 10	711-035209	CADJ1561	HMPCE 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	HMPCE 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	HMPCE 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	RMPCE 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	COUCARCBAA	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 (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)

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user@host> show chassis hardware clei-models
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Hardware inventory:
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Item	Version	Part number	CLEI code	FRU model number
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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)

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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			JN11E3217AFK	MX2010
Midplane	REV 01	750-044636	ABAB8506	Lower Backplane
Midplane 1	REV 01	711-044557	ZY8296	Upper Backplane
PMP	REV 03	711-032426	ACA11388	Power Midplane
Front Panel 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	ALP0TR1	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)

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user@host > show chassis hardware detail
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Hardware inventory:
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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 Module	REV 01	740-045050	1E02224000G	DC 52V Power Supply
PSM 4 Module	REV 01	740-045050	1E022240013	DC 52V Power Supply
PSM 5 Module	REV 01	740-045050	1E022240007	DC 52V Power Supply
PSM 6 Module	REV 01	740-045050	1E02224001C	DC 52V Power Supply
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	HMPD PMB 2G
PIC 0		BUILTIN	BUILTIN	8X10GE SFP
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
Hardware inventory:
Item              Version  Part number  Serial number  Description
Chassis
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
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

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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 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
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
Address 0x40: ff ff ff ff ff 00 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            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
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
Address 0x40: ff ff ff ff ff 00 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 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
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
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
Address 0x70: ff ff ff 93 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

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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 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:

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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 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 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
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
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 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
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
Address 0x70: ff ff ff c6 ff ff ff ff ff ff ff ff ff ff ff
CPU          REV 08    711-035209  CAAB9842          HMPMPC 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: HMPMPC 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
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        00000000000000000000000000000000
PSM 5         REV 0B   740-033727   VG00015        00000000000000000000000000000000
PSM 6         REV 0B   740-033727   VH00097        00000000000000000000000000000000
PSM 7         REV 0C   740-033727   VJ00151        00000000000000000000000000000000

```

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 > 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	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	HMPD 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	RMPD 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	RMPD 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	RMPD 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	AMPD 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	RMPD 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       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         HMPCE PMB 2G
  MIC 0       REV 14   750-033196   CAAW9214       1X100GE CXP

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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	RMPD 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	RMPD 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	RMPD 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	AMPD 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	RMPD 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				
Jedec Code:	0x7fb0	EEPROM Version:	0x02	
		S/N:	JN11C9AFEAFK	MX2010
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
Jedec Code:	0x7fb0	EEPROM Version:	0x02	
P/N:	750-044636	S/N:	ABAB9188	
Assembly ID:	0x0b66	Assembly Version:	01.35	
Date:	06-21-2013	Assembly Flags:	0x00	
Version:	REV 35	CLEI Code:	IPMU810ARA	
ID:	Lower Backplane	FRU Model Number:	CHAS-BP-MX2010-S	
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
Jedec Code:	0x7fb0	EEPROM Version:	0x01	
P/N:	711-044557	S/N:	ABAB8729	
Assembly ID:	0x0b65	Assembly Version:	01.02	
Date:	03-21-2013	Assembly Flags:	0x00	
Version:	REV 02			
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 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 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				
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 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 ff
  Address 0x70: ff 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 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 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
  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

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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
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
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
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
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
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  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
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
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 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 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 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

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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 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 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 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 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 ff
..

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show chassis hardware (MX2020 Router)

```

user@host > show chassis hardware
Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis
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

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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	ABB11095	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	ABB11082	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	ABBN6534	AMPC PMB
PIC 0		BUILTIN	BUILTIN	4x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	AK80OMB4	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	AK80LJG	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	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 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	ABBJ0966	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	AJQQQ5G	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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Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis                               JN11E2227AFJ  MX2020
Midplane                               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

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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	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 2	REV 30	750-028467	ABBN0316	MPC 3D 16x 10GE
CPU	REV 10	711-029089	ABB11082	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	ABBN6534	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	AK80LJG	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	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
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	AJQQQ5G	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	ABBJ1084	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	ABBJ0966	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	ABBN6542	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	AK80LFC	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

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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	

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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
ADC 1	REV 13	750-043596	PROTOXCLEI
ADC 2	REV 13	750-043596	IPUCBA8CAA
ADC 3	REV 13	750-043596	IPUCBA8CAA
ADC 4	REV 13	750-043596	IPUCBA8CAA
ADC 5	REV 13	750-043596	PROTOXCLEI
ADC 6	REV 13	750-043596	PROTOXCLEI
ADC 7	REV 07	750-043596	PROTOXCLEI
ADC 8	REV 07	750-043596	PROTOXCLEI
ADC 9	REV 07	750-043596	PROTOXCLEI
ADC 10	REV 13	750-043596	IPUCBA8CAA
ADC 12	REV 13	750-043596	IPUCBA8CAA
ADC 13	REV 13	750-043596	PROTOXCLEI
ADC 14	REV 13	750-043596	PROTOXCLEI
ADC 15	REV 13	750-043596	IPUCBA8CAA
ADC 16	REV 13	750-043596	PROTOXCLEI
ADC 17	REV 13	750-043596	PROTOXCLEI
ADC 18	REV 13	750-043596	PROTOXCLEI
ADC 19	REV 11	750-043596	PROTOXCLEI
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
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 Module	REV 01	740-050037	1EDB3130079	DC 52V Power Supply
PSM 4 Module	REV 01	740-050037	1EDB3130077	DC 52V Power Supply
PSM 5 Module	REV 01	740-050037	1EDB3130020	DC 52V Power Supply
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
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	RMPK 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	RMPK 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	RMPD 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	AMCOJTC	SFP+-10G-SR
Xcvr 14	REV 01	740-021308	ANAOMQ0	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	RMPD 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	RMPD PMB
PIC 0		BUILTIN	BUILTIN	12X10GE SFPP OTN
Xcvr 0	REV 01	740-021308	AQA0EXJ	SFP+-10G-SR
Xcvr 1	REV 01	740-021308	AQGOM6D	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	AQGOMTM	SFP+-10G-SR
Xcvr 5	REV 01	740-021308	AQA07NE	SFP+-10G-SR
Xcvr 6	REV 01	740-021308	AQGOM41	SFP+-10G-SR
Xcvr 7	REV 01	740-021308	AQGOMU7	SFP+-10G-SR

Xcvr 8	REV 01	740-021308	AQGOMUG	SFP+-10G-SR
Xcvr 9	REV 01	740-021308	AQGOMMX	SFP+-10G-SR
Xcvr 10	REV 01	740-021308	AQGOM5K	SFP+-10G-SR
Xcvr 11	REV 01	740-021308	AQGOLVZ	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)

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user@host>show chassis hardware detail
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Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN120BADBAFJ	MX2020
Midplane				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	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 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)

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

```
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 ff
  Address 0x70: ff ff ff d3 ff 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 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 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 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 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
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
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 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 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 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 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
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
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
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
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
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
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
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
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
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
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> 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 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 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 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 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-MS
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-MS
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 ff ff ff 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-MS
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	HMPC 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	HMPC 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> 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-OC192-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 SFPP
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 SFPP
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


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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
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          REV 26    750-028392   ZY0187         MIC-3D-20GE-SFP
Fan Tray
FANTRAY-MX80-S

```

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
CB 0                  REV 13    710-002728   BC1577        unknown
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

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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)

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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
Fan Tray 1
Fan Tray 2

Front Top Fan Tray
Front Bottom Fan Tray
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			
Address 0x20:	ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff			
Address 0x30:	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			
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			

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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

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show chassis hardware (T4000 Router)

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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
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

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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)

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user@host> show chassis hardware
Hardware inventory:

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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)

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user@host> show chassis hardware

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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-DUO-C1800-8G-S
Routing Engine 1	REV 06	740-026941		RE-DUO-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)

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	AJDOGV3	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)

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user@host> show chassis hardware lcc 0
lcc0-re0:
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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:
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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	P8P0A3T	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	P9POXV4	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)

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user@host> show chassis hardware
sfc0-re0:
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Hardware inventory:
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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

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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:

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	P9M0U3Z	SFP-SX
Xcvr 5	REV 01	740-011782	P9M0U0C	SFP-SX
Xcvr 6	REV 01	740-011782	P9M0TLG	SFP-SX
Xcvr 7	REV 01	740-011782	P9M0U0F	SFP-SX
Xcvr 8	REV 01	740-011613	PFA6LAP	SFP-SX
Xcvr 9	REV 01	740-011782	PCH2P0U	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)

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user@host> show chassis hardware extensive
sfc0-re0:
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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				

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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

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show chassis hardware clei-models (TX Matrix Plus Router)

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user@host> show chassis hardware clei-models
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

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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

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lcc0-re0:
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Hardware inventory:
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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-1CHOC12-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

lcc1-re0:

Hardware inventory:

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
sfc0-re0:
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Hardware inventory:

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
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:

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

show chassis hardware models (TX Matrix Plus Router)

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user@host> show chassis hardware models
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	yyyyyyyyyyyyyyyyyyyy
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:

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

lcc1-re0:

Hardware inventory:

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

lcc2-re0:

Hardware inventory:

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:

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> show chassis hardware
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

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lcc0-re0:
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Hardware inventory:
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Item	Version	Part number	Serial number	Description
Chassis			JN1B23FEAHA	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:

Hardware inventory:

Item	Version	Part number	Serial number	Description
Chassis			JN1B3975AHA	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
sfc0-re0:
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Hardware inventory:
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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

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lcc0-re0:
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Hardware inventory:
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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		
Xcvr 7	REV 01	740-048813		
SIB 4	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		
Fan Tray 0				FANTRAY-T-S

Fan Tray 1
Fan Tray 2
[Output Truncated]

FANTRAY-T-S
FANTRAY-TXP3D-LCC-R-S

show chassis hardware detail (TX Matrix Plus Router with 3D SIBs)

```
user@host> show chassis hardware detail
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
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:

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:

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
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:
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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

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				


```

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
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	X12J00008	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                               QFX Routing Engine
FPC 0          REV 04    750-044071   BBAR3902      QFX3500-48S4Q-AFI
CPU            BUILTIN   BUILTIN     BUILTIN       FPC CPU
PIC 0          BUILTIN   BUILTIN     BUILTIN       48x 10G-SFP+
PIC 1          BUILTIN   BUILTIN     BUILTIN       15x 10G-SFP+
MGMT BRD       REV 02    750-044063   BBAR0398      QFX3500-MGMT-SFP-AF0
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-AF0
Fan Tray 0                               QFX Fan Tray, Back to
Front Airflow
Fan Tray 1                               QFX Fan Tray, Back to
Front Airflow
Fan Tray 2                               QFX Fan Tray, Back to
Front Airflow

```

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                               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
Fan Tray 1      QFX5100-96S-FANAFO
Fan Tray 2      QFX5100-96S-FANAFO

```

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
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 (PTX3000 Packet Transport Router with the IPLC module)

```

user@switch> show chassis hardware
Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis
Midplane      REV 11    750-044645   ACAL0016      Backplane
FPM           REV 03    760-044663   ACAR0137      Front Panel Display

```

PSM 1	REV 02	740-044981	1EDD3240017	AC 12V Power Supply
PSM 2	REV 02	740-044981	1ETW3150019	AC 12V Power Supply
PSM 3	REV 02	740-044981	1EDD3240018	AC 12V Power Supply
Routing Engine 0	REV 10	740-026942	P737A-004090	RE-DUO-2600
CB 0	REV 07	750-044656	ACAR0311	
CB 1	REV 01	750-044656	ACAM0060	Hendricks CB P1
FPC 2	REV 30	750-044650	ACDM8219	FPC
CPU	REV 09	711-044647	ACDM4300	PMB
PIC 0	REV 22	750-031913	ACAP8608	24x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-031980	B11C01363	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	AQ71CB0	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	AQR367X	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	ANT00GV	SFP+-10G-SR
Xcvr 4	REV 01	740-031980	ANT080L	SFP+-10G-SR
Xcvr 5	REV 01	740-031980	ANT080T	SFP+-10G-SR
Xcvr 6	REV 01	740-031980	ANSOELT	SFP+-10G-SR
Xcvr 7	REV 01	740-031980	ANT08NM	SFP+-10G-SR
Xcvr 8	REV 01	740-031980	ANT00DL	SFP+-10G-SR
Xcvr 9	REV 01	740-031980	ANS02H0	SFP+-10G-SR
Xcvr 10	REV 01	740-031980	AK80LAL	SFP+-10G-SR
Xcvr 11	REV 01	740-031980	APJ2B48	SFP+-10G-SR
Xcvr 12	REV 01	740-021308	ANAOMM3	SFP+-10G-SR
Xcvr 13	REV 01	740-031980	B11J00674	SFP+-10G-SR
Xcvr 14	REV 01	740-021308	9ZDZ06A00046	SFP+-10G-SR
Xcvr 15	REV 01	740-031980	ANT07E3	SFP+-10G-SR
Xcvr 16	REV 01	740-031980	ANT00L8	SFP+-10G-SR
Xcvr 17	REV 01	740-031980	ALP0KDL	SFP+-10G-SR
Xcvr 18	REV 01	740-031980	ANT07UX	SFP+-10G-SR
Xcvr 19	REV 01	740-031980	ANT07UV	SFP+-10G-SR
Xcvr 20	REV 01	740-031980	ANT088Y	SFP+-10G-SR
Xcvr 21	REV 01	740-031980	ANT09JZ	SFP+-10G-SR
Xcvr 23	REV 01	740-031980	AK80MCM	SFP+-10G-SR
FPC 5	REV 01	650-064993	ABCD0008	OPT3-SFF-PTX
CPU				
FPC 6	REV 30	750-044650	ACAR1923	FPC
CPU	REV 09	711-044647	ACAR3284	PMB
PIC 0	REV 21	750-031913	BBAX1094	24x 10GE(LAN) SFP+
Xcvr 0	REV 01	740-021308	AS317HK	SFP+-10G-SR
Xcvr 1	REV 01	740-031980	ANT00BT	SFP+-10G-SR
Xcvr 2	REV 01	740-031980	ANT093M	SFP+-10G-SR
Xcvr 3	REV 01	740-031980	AP40VZD	SFP+-10G-SR
Xcvr 4	REV 01	740-031980	AMB1AJ9	SFP+-10G-SR
Xcvr 5	REV 01	740-031980	AHR02W0	SFP+-10G-SR
Xcvr 6	REV 01	740-031980	B11C01429	SFP+-10G-SR
Xcvr 7	REV 01	740-031980	AQM1VFM	SFP+-10G-SR
Xcvr 8	REV 01	740-031980	B11K01886	SFP+-10G-SR
Xcvr 9	REV 01	740-031980	AQR3E9A	SFP+-10G-SR
Xcvr 10	REV 01	740-031980	ANT09KX	SFP+-10G-SR
Xcvr 12	REV 01	740-031980	AQ31GR8	SFP+-10G-SR
Xcvr 13	REV 01	740-031980	ALP139Q	SFP+-10G-SR
Xcvr 14	REV 01	740-031980	ALP12SY	SFP+-10G-SR
Xcvr 15	REV 01	740-031980	AK80LAN	SFP+-10G-SR
Xcvr 16	REV 01	740-021308	T09K75190	SFP+-10G-SR
Xcvr 17	REV 01	740-031980	ANS02HT	SFP+-10G-SR
Xcvr 18	REV 01	740-031980	ALPOTVN	SFP+-10G-SR
Xcvr 19	REV 01	740-031980	AQR0BHE	SFP+-10G-SR
Xcvr 20	REV 01	740-031980	ALP11S0	SFP+-10G-SR
Xcvr 21	REV 01	740-031851	PLM1L33	UNSUPPORTED
Xcvr 22	REV 01	740-031980	AQL1RJ5	SFP+-10G-SR
Xcvr 23	REV 01	740-031980	AD1141A04XL	SFP+-10G-SR
FPC 12	REV 31	750-044650	ACDS6321	FPC

CPU	REV 09	711-044647	ACDP4556	PMB
PIC 0	REV 09	750-042043	EL7910	2x100G DWDM OTN
Xcvr 0	REV 01	740-043694	71242008-B	OTN-100G-LH
Xcvr 1	REV 01	740-043694	71242008-B	OTN-100G-LH
FPC 15	REV 01	650-064993	ABCD0006	OPT3-SFF-PTX
CPU				
SIB 0	REV 06	750-044653	ACAM0393	Hendricks SIB P1
SIB 1	REV 17	750-044653	ACAR1704	SIB
SIB 2	REV 17	750-044653	ACAR1684	SIB
SIB 3	REV 17	750-044653	ACAR1705	SIB
SIB 4	REV 17	750-044653	ACAR1727	SIB
SIB 5	REV 17	750-044653	ACAR1675	SIB
SIB 6	REV 17	750-044653	ACAR1692	SIB
SIB 7	REV 06	750-044653	ACAM0404	Hendricks SIB P1
SIB 8	REV 17	750-044653	ACAR1700	SIB
Fan Tray 0	REV 08	760-044659	ACAR0771	Fan Tray (Exhaust)
Fan Tray 1	REV 10	760-044659	ACAR2762	Fan Tray (Exhaust)

show chassis hardware (PTX5000 Packet Transport Router)

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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	AJCOBHC	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-P1A)

```
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                               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
  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-DU0-C2600-16G-S
Routing Engine 1	REV 06	740-026942	P737A-002438	RE-DU0-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> 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> 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
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
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
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
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
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 20 01 00 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       RE-PTX1000
CPU           BUILTIN   BUILTIN      PTX1000-FPC-P2-BUILTIN
PIC 0         BUILTIN   BUILTIN      FPC CPU
                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                               PTX1000 Fan Tray 2, Front
to Back Airflow - AFO

```

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
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
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    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
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
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 ff ff ff
  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 (QFX3500 Switch running Enhanced Layer 2 Software)

```

user@switch> show chassis hardware
Hardware inventory:
Item          Version  Part number  Serial number  Description
Chassis                               P3566         QFX3500
Pseudo CB 0
Routing Engine 0
FPC 0          REV 16    750-036931   P3566-C        QFX3500-48S4Q
  CPU          BUILTIN   BUILTIN      FPC CPU
  PIC 0        BUILTIN   BUILTIN      48x 10G-SFP+
    Xcvr 12    REV 01    740-030658   AD1125A0438    SFP+-10G-USR
    Xcvr 13    REV 01    740-030658   AD1125A02GN    SFP+-10G-USR
  PIC 1        BUILTIN   BUILTIN      4x 40G-QSFP+
  PIC 2
  MGMT BRD     REV 10    750-036946   BBAW0328       QFX3500-MGMT-RJ45-AFI
Power Supply 0 Rev 05    740-032091   WA13035        JPSU-650W-AC-AFI
Power Supply 1
Fan Tray 0                               QFX3500 Fan Tray, Front
  to Back Airflow
Fan Tray 1                               QFX3500 Fan Tray, Front
  to Back Airflow
Fan Tray 2                               QFX3500 Fan Tray, Front
  to Back Airflow

```


show chassis hardware (QFX5100 Switch running Enhanced Layer 2 Software)

```

user@switch> show chassis hardware
Hardware inventory:
Item              Version  Part number  Serial number  Description
Chassis                               TB3113280048  QFX5100-24Q-2P
Pseudo CB 0
Routing Engine 0
FPC 0              REV 02    650-049942   TB3113280048  QFX5100-24Q-2P
CPU
PIC 0              BUILTIN    BUILTIN      24x 40G-QSFP
  Xcvr 8           REV 01    740-032986   QA470143      QSFP+-40G-SR4
  Xcvr 14          REV 01    740-032986   QB500525      QSFP+-40G-SR4
PIC 1              REV 02    611-049555   RR3113310169  QFX-EM-4Q
  Xcvr 0           REV 01    740-032986   QC440904      QSFP+-40G-SR4
  Xcvr 1           REV 01    740-032986   QB240154      QSFP+-40G-SR4
  Xcvr 2           REV 01    740-035085   018110105     QSFP+-40G-LPBK
PIC 2              REV 02    611-049555   RR3113310209  QFX-EM-4Q
  Xcvr 0           REV 01    740-032986   QB190270      QSFP+-40G-SR4
  Xcvr 1           REV 01    740-035085   018110063     QSFP+-40G-LPBK
  Xcvr 2           REV 01    740-032986   QB210034      QSFP+-40G-SR4
Power Supply 0     REV 03    740-041741   1GA23110973   JPSU-650W-AC-AFO
Power Supply 1     REV 03    740-041741   1GA23090878   JPSU-650W-AC-AFO
Fan Tray 0
  to Back Airflow - AFO
Fan Tray 1
  to Back Airflow - AFO
Fan Tray 2
  to Back Airflow - AFO
Fan Tray 3
  to Back Airflow - AFO
Fan Tray 4
  to Back Airflow - AFO
QFX5100 Fan Tray 0, Front
QFX5100 Fan Tray 1, Front
QFX5100 Fan Tray 2, Front
QFX5100 Fan Tray 3, Front
QFX5100 Fan Tray 4, Front

```

show chassis in-service-upgrade

Syntax `show chassis in-service-upgrade`

Release Information Command introduced in Junos OS Release 9.0.
 Command introduced in Junos OS Release 12.3R2, 13.1R2, and 13.2R1 for TX Matrix Plus routers.
 Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
 Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
 Command introduced in Junos OS Release 13.2 for PTX5000 routers.
 Command introduced in Junos OS Release 13.2X51-D15 for the QFX Series.

Description 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.



NOTE: Only Intelligent Queuing (IQ) PICs are displayed by this command output. Unified ISSU status for other PIC types is controlled internally by the FPC.

Options This command has no options.

Required Privilege Level view

Related Documentation

- *request system software abort*
- *request system software in-service-upgrade*
- *Getting Started with Unified In-Service Software Upgrade*
- *Example: Performing a Unified ISSU*

List of Sample Output [show chassis in-service-upgrade on page 1551](#)
[show chassis in-service-upgrade \(MX2010 Router\) on page 1551](#)
[show chassis in-service-upgrade \(MX2020 Router\) on page 1551](#)
[show chassis in-service-upgrade \(TX Matrix Plus Router\) on page 1552](#)
[show chassis in-service-upgrade \(QFX5100 Switch\) on page 1553](#)

Output Fields Table 102 on page 1550 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 102: show chassis in-service-upgrade Output Fields

Field Name	Field Description
Item	Flexible PIC Concentrator (FPC) slot number.

Table 102: show chassis in-service-upgrade Output Fields (*continued*)

Field Name	Field Description
Status	FPC and corresponding PIC state. State can be either of the following: <ul style="list-style-type: none"> • Online—FPC is online and running. • Offline—FPC is powered down.
Reason	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 (TX Matrix Plus Router)

```
user@host> show chassis in-service-upgrade
```

```
lcc0-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	

```
lcc1-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	

```
lcc2-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 lccs

Syntax	show chassis lccs
Release Information	Command introduced before Junos OS Release 7.4.
Description	(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.
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • request chassis lcc on page 732 • <i>Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade (CLI Procedure)</i> • <i>fpc</i>
List of Sample Output	show chassis lccs on page 1554 show chassis lccs (TX Matrix Plus router with 3D SIBs) on page 1555
Output Fields	Table 103 on page 1554 lists the output fields for the show chassis lccs command. Output fields are listed in the approximate order in which they appear.

Table 103: show chassis lccs Output Fields

Field Name	Field Description
Slot	LCC slot number.
State	LCC status: <ul style="list-style-type: none"> • Online—LCC is online and running. • Offline—LCC is powered down. • Empty—No LCC is present.
Uptime	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 597](#)
- *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 1556](#)

Output Fields [Table 104 on page 1556](#) lists the output fields for the **show chassis lcc-mode** command. Output fields are listed in the approximate order in which they appear.

Table 104: 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"> • T1600—LCC functions as a T1600 router. • T4000—LCC functions as a T4000 router. • EMPTY—LCC is not configured as either a T1600 or a T4000 router.

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

List of Syntax	Syntax on page 1558 Syntax (TX Matrix Router) on page 1558 Syntax (TX Matrix Plus Router) on page 1558 Syntax (MX Series Router) on page 1558 Syntax (QFX Series) on page 1558 Syntax (OCX Series) on page 1558
Syntax	show chassis location
Syntax (TX Matrix Router)	show chassis location <fpc | interface (by-name <i>name</i> | by-slot fpc number lcc number) | lcc number | scc>
Syntax (TX Matrix Plus Router)	show chassis location <fpc | interface (by-name <i>name</i> | by-slot fpc number lcc number) | lcc number | sfc number>
Syntax (MX Series Router)	show chassis location <all-members> <local> <member <i>member-id</i> >
Syntax (QFX Series)	show chassis location <interconnect-device <i>name</i> > <node-device <i>name</i> >
Syntax (OCX Series)	show chassis location
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. sfc 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.
Description	Display the physical location of the chassis. This command can only be used on the master Routing Engine.
Options	none —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 <i>name</i> —(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 1560](#)
[show chassis location fpc \(TX Matrix Router\) on page 1561](#)
[show chassis location interface by-slot \(TX Matrix Router\) on page 1561](#)
[show chassis location fpc \(TX Matrix Plus Router\) on page 1561](#)
[show chassis location interface by-slot \(TX Matrix Plus Router\) on page 1561](#)
[show chassis location \(QFX Series and OCX Series\) on page 1561](#)
[show chassis location \(QFabric Systems\) on page 1561](#)

Output Fields [Table 105 on page 1560](#) lists the output fields for the **show chassis location** command. Output fields are listed in the approximate order in which they appear.

Table 105: 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.
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 1562 Syntax (TX Matrix Router) on page 1562 Syntax (TX Matrix Plus Router) on page 1562 Syntax (MX Series Router) on page 1562 Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers) on page 1562 Syntax (QFX Series) on page 1562 Syntax (OCX Series) on page 1562 Syntax (ACX Series Universal Access Routers) on page 1562
Syntax	show chassis mac-addresses
Syntax (TX Matrix Router)	show chassis mac-addresses <lcc <i>number</i> | scc>
Syntax (TX Matrix Plus Router)	show chassis mac-addresses <lcc <i>number</i> | sfc <i>number</i> >
Syntax (MX Series Router)	show chassis mac-addresses <all-members> <local> <member <i>member-id</i> >
Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers)	show chassis mac-addresses
Syntax (QFX Series)	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 Access Routers)	show chassis mac-addresses
Release Information	Command introduced before JUNOS Release 7.4. Command introduced in JUNOS Release 9.0 for EX Series switches. sfc option introduced for the TX Matrix Plus router in JUNOS Release 9.6. Command introduced in Junos OS Release 11.1 for QFX Series. Command introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers. Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers. Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers. Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Description	Display the media access control (MAC) addresses for the router, switch chassis, or switch.

Options **none**—(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.

all-members—(MX Series routers only) (Optional) Display the MAC addresses for all the member routers of the Virtual Chassis configuration.

interconnect-device *name*—(QFabric systems only) (Optional) Display the MAC addresses for the Interconnect device.

lcc *number*—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display MAC addresses for a specified T640 router (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 systems 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 (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 1564](#)
- [show chassis mac-addresses \(MX104 Router\) on page 1564](#)
- [show chassis mac-addresses \(MX2010 Router\) on page 1564](#)
- [show chassis mac-addresses \(MX2020 Router\) on page 1565](#)
- [show chassis mac-addresses \(TX Matrix Router\) on page 1565](#)
- [show chassis mac-addresses \(TX Matrix Plus Router\) on page 1565](#)
- [show chassis mac-addresses \(QFX Series and OCX Series \) on page 1566](#)
- [show chassis mac-addresses interconnect-device \(QFabric Systems\) on page 1566](#)
- [show chassis mac-addresses node-group \(QFabric Systems\) on page 1566](#)
- [show chassis mac-addresses \(ACX2000 Universal Access Router\) on page 1566](#)

Output Fields [Table 106 on page 1564](#) lists the output fields for the **show chassis mac-addresses** command. Output fields are listed in the approximate order in which they appear.

Table 106: show chassis mac-addresses Output Fields

Field Name	Field Description
MAC address information	
Public base address	Base address of the MAC addresses allocated to this router or switch.
Public count	Number of allocated public addresses.
Private base address	Base address of the private MAC addresses allocated to this router or switch.
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 (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 (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 Systems)

```

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 Systems)

```

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 Access 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 network-services

Syntax	show chassis network-services
Release Information	<p>Command introduced in Junos OS Release 9.4.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 15.F5 for PTX Series Routers with third-generation FPCs.</p>
Description	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.
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • enhanced-mode on page 557
List of Sample Output	<p>show chassis network services on page 1567</p> <p>show chassis network services (MX104 Router) on page 1568</p> <p>show chassis network services (MX2010 Router) on page 1568</p> <p>show chassis network services (MX2020 Router) on page 1568</p> <p>show chassis network services (PTX Router with third-generation FPCs) on page 1568</p>
Output Fields	Table 107 on page 1567 lists the output fields for the show chassis network services command. Output fields are listed in the approximate order in which they appear.

Table 107: show chassis network services Output Fields

Field Name	Field Description
Network Services Mode	<p>Network services mode configured for the router:</p> <ul style="list-style-type: none"> • IP—IP Network Services mode. • Ethernet—Ethernet Network Services mode. • enhanced-ip—Enhanced IP Network Services mode • enhanced-ethernet—Enhanced Ethernet Network Services mode • Enhanced-Mode—Enhanced mode for PTX Series routers that have third-generation FPCs installed. See enhanced-mode.

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 (PTX Router with third-generation FPCs)

```
user@host> show chassis network services
Network Services Mode: Enhanced-Mode
```

show chassis oss-map

Syntax	show chassis oss-map
Release Information	Command introduced in Junos OS Release 12.3R3, 13.1R2, and 13.2R1 for T4000 routers.
Description	(T4000 routers only) Display the operations support systems (OSS) mapping details.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• Configuring OSS Mapping to Represent a T4000 Chassis as a T1600 or a T640 Chassis on page 304• Example: Configuring a T4000 Chassis to Represent a T640 Chassis on page 502• oss-map on page 625• Understanding Operations Support Systems Mapping on page 36
Output Fields	Table 108 on page 1569 lists the output fields for the show chassis oss-map command. Output fields are listed in the approximate order in which they appear.

Table 108: 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

List of Syntax	Syntax on page 1570 Syntax (TX Matrix and TX Matrix Plus Routers) on page 1570 Syntax (MX Series Routers and EX Series Switches) on page 1570 Syntax (MX2010 and MX2010 3D Universal Edge Routers) on page 1570 Syntax (PTX Series Packet Transport Router) on page 1570 Syntax (QFX Series) on page 1570 Syntax (OCX Series) on page 1570 Syntax (ACX Series Universal Access Routers) on page 1570
Syntax	<code>show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i></code>
Syntax (TX Matrix and TX Matrix Plus Routers)	<code>show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i> <lcc <i>number</i>></code>
Syntax (MX Series Routers and EX Series Switches)	<code>show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i> <all-members></code> <code><local></code> <code><member <i>member-id</i>></code>
Syntax (MX2010 and MX2010 3D Universal Edge Routers)	<code>show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i></code>
Syntax (PTX Series Packet Transport Router)	<code>show chassis pic transport fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i></code>
Syntax (QFX Series)	<code>show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i> <interconnect-device <i>name</i> (fpc-slot <i>slot-number</i> | pic-slot <i>slot-number</i>)></code> <code><node-device <i>name</i> pic-slot <i>slot-number</i>></code>
Syntax (OCX Series)	<code>show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i></code>
Syntax (ACX Series Universal Access Routers)	<code>show chassis pic fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i></code>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches. Command introduced in Junos OS Release 11.1 for QFX Series. Command introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers. Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers. Command introduced in Junos OS Release 13.2 for PTX Series Packet Transport Routers. Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers. Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Description	Display status information about the PIC installed in the specified Flexible PIC Concentrator (FPC) and PIC slot.

Options **fpc-slot *slot-number***—Display information about the PIC in this particular FPC slot:

- 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 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. For example, the following commands have the same result:

```
user@host> show chassis pic fpc-slot 1 lcc 1 pic-slot 1
user@host> show chassis pic fpc-slot 9 pic-slot 1
```

- M120 routers only—Replace ***slot-number*** with a value from 0 through 5.
- 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.
- 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 739](#)
- [show chassis hardware on page 1368](#)
- [100-Gigabit Ethernet Type 4 PIC with CFP Overview](#)

List of Sample Output

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[show chassis pic fpc-slot pic-slot \(PIC Offline\) on page 1576](#)

[show chassis pic fpc-slot pic-slot \(FPC Offline\) on page 1576](#)
[show chassis pic fpc-slot pic-slot \(FPC Not Present\) on page 1576](#)
[show chassis pic fpc-slot pic-slot \(PIC Not Present\) on page 1576](#)
[show chassis pic fpc-slot 3 pic-slot 0 \(M120 Router\) on page 1576](#)
[show chassis pic fpc-slot pic-slot \(MX104 Router\) on page 1576](#)
[show chassis pic fpc-slot pic-slot \(MX960 Router with Bidirectional Optics\) on page 1577](#)
[show chassis pic fpc-slot pic-slot \(MX480 Router with 100-Gigabit Ethernet MIC\) on page 1577](#)
[show chassis pic fpc-slot pic-slot \(MX240, MX480, MX960 Routers with Application Services Modular Line Card\) on page 1577](#)
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[show chassis pic fpc-slot pic-slot \(MX480 Router with MPC4E\) on page 1579](#)
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[show chassis pic fpc-slot pic-slot \(MX2010 Router with OTN Interfaces\) on page 1579](#)
[show chassis pic fpc-slot pic-slot \(MX2010 Router\) on page 1579](#)
[show chassis pic fpc-slot pic-slot \(MX2020 Router\) on page 1580](#)
[show chassis pic fpc-slot pic-slot \(MX2020 Router with MPC5EQ and MPC6E\) on page 1580](#)
[show chassis pic fpc-slot pic-slot \(MX2020 Router with MPC6E and OTN MIC\) on page 1580](#)
[show chassis pic fpc-slot pic-slot \(MX2020 Router with MPC4E\) on page 1581](#)
[show chassis pic fpc-slot pic-slot \(T1600 Router with 100-Gigabit Ethernet PIC\) on page 1581](#)
[show chassis pic fpc-slot pic-slot lcc \(TX Matrix Router\) on page 1581](#)
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[show chassis pic fpc-slot pic-slot \(Next-Generation SONET/SDH SFP\) on page 1582](#)
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[show chassis pic fpc-slot 0 pic-slot 1 \(4x CHOC3 SONET CE SFP\) on page 1582](#)
[show chassis pic fpc-slot 0 pic-slot 0 \(SONET/SDH OC3/STM1 \[Multi-Rate\] MIC with SFP\) on page 1583](#)
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[show chassis pic fpc-slot 5 pic-slot 0 \(4-Port Channelized SONET/SDH OC3/STM1 \[Multi-Rate\] MIC with SFP\) on page 1583](#)
[show chassis pic fpc-slot 1 pic-slot 0 \(1-Port OC192/STM64 MIC with XFP\) on page 1584](#)
[show chassis pic fpc-slot 1 pic-slot 2 \(8-Port DS3/E3 MIC\) on page 1584](#)
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[show chassis pic fpc-slot pic-slot \(QFX3500 Switch\) on page 1584](#)
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[show chassis pic fpc-slot 0 pic-slot 1 \(ACX2000 Universal Access Router\) on page 1586](#)
[show chassis pic FPC-slot 1 PIC-slot 0 \(MX Routers with Media Services Blade \[MSB\]\) on page 1586](#)

[show chassis pic FPC slot 1, PIC slot 2 \(MX Routers with Media Services Blade \[MSB\]\) on page 1586](#)

Output Fields [Table 109 on page 1574](#) lists the output fields for the **show chassis pic** command. Output fields are listed in the approximate order in which they appear.

Table 109: show chassis pic Output Fields

Field Name	Field Description
Type	<p>PIC type.</p> <p>NOTE: On the 1-port OC192/STM64 MICs with the SDH framing mode, the type is displayed as MIC-3D-1STM64-XFP and with the SONET framing mode, the type is displayed as MIC-3D-1OC192-XFP. By default, the 1-port OC192/STM64 MICs displays the type as MIC-3D-1OC192-XFP.</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"> • Online— PIC is online and running. • Offline—PIC is powered down.
PIC version	PIC hardware version.
Uptime	How long the PIC has been online.
Package	(Multiservices PICs only) Services package supported: Layer-2 or Layer-3 .
Port Number	Port number for the PIC.
Cable Type	Type of cable connected to the port: LH , LX , or SX .
PIC Port Information (MX480 Router 100-Gigabit Ethernet CFP)	<p>Port-level information for the PIC.</p> <ul style="list-style-type: none"> • Port—Port number • Cable type—Type of optical transceiver installed. • Fiber type—Type of fiber. SM is single-mode. • Xcvr vendor—Transceiver vendor name. • Xcvr vendor part number—Transceiver vendor part number. • Wavelength—Wavelength of the transmitted signal. Uplinks and downlinks are always 1550 nm. There is a separate fiber for each direction • Xcvr Firmware—Transceiver firmware version.

Table 109: show chassis pic Output Fields (*continued*)

Field Name	Field Description
PIC Port Information (MX960 Router Bidirectional Optics)	<p>Port-level information for the PIC.</p> <ul style="list-style-type: none"> Port—Port number Cable type—Type of small form-factor pluggable (SFP) optical transceiver installed. Uplink interfaces display -U. Down link interfaces display -D. Fiber type—Type of fiber. SM is single-mode. Xcvr vendor—Transceiver vendor name. Xcvr vendor part number—Transceiver vendor part number. <ul style="list-style-type: none"> BX10-10-km bidirectional optics. BX40-40-km bidirectional optics. SFP-LX-40-km SFP optics. Wavelength—Wavelength of the transmitted signal. Uplinks are always 1310 nm. Downlinks are either 1490 nm or 1550 nm.
PIC Port Information (Next-Generation SONET/SDH SFP)	<p>Port-level information for the next-generation SONET/SDH SFP PIC.</p> <ul style="list-style-type: none"> Port—Port number. Cable type—Type of small form-factor pluggable (SFP) optical transceiver installed. Fiber type—Type of fiber: SM (single-mode) or MM (multimode). Xcvr vendor—Transceiver vendor name. Xcvr vendor part number—Transceiver vendor part number. Wavelength—Wavelength of the transmitted signal. Next-generation SONET/SDH SFPs use 1310 nm.
PIC port information (MX104 router)	<p>Port-level information for the PIC.</p> <ul style="list-style-type: none"> Port—Port number Cable type—Type of optical transceiver installed. Fiber type—Type of fiber. SM is single-mode. Xcvr vendor—Transceiver vendor name. Xcvr vendor part number—Transceiver vendor part number. Wavelength—Wavelength of the transmitted signal. Xcvr Firmware—Firmware version of the transceiver.
Multirate Mode	Rate-selectability status for the MIC: Enabled or Disabled .
Channelization	Indicates whether channelization is enabled or disabled on the DS3/E3 MIC.

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      Cable      Xcvr      Xcvr Vendor
Number    Type        Vendor Name 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 (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:
Fiber      Xcvr vendor      Wave-      Xcvr
Port Cable type    type Xcvr vendor      part number length
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)
  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	OCP	TRXBG1LXDBVM2-JW	1490 nm
4	SFP-1000BASE-BX10-D	SM	OCP	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	OCP	TRXBG1LXDDBMH-J1	1310 nm
8	SFP-1000BASE-BX10-U	SM	OCP	TRXBG1LXDDBMH-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.	FTLC1181RDNS-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 (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:

```

		Fiber	Xcvr vendor	Wave-	Xcvr
Port	Cable type	type	Xcvr vendor	part number	length
Firmware					
0	100G LH	SM	MULTILANE SAL	ML4030-ACO-2	1528.77 nm -
1568.36 nm 1.0					
1	100G LH	SM	MULTILANE SAL	ML4030-ACO-2	1528.77 nm -
1568.36 nm 1.0					
2	100G LH	SM	JUNIPER-FUJITSU	FIM38500/222	1528.77 nm -
1568.36 nm 1.16					
3	100G LH	SM	FUJITSU	FIM38500/222	1528.77 nm -
1568.36 nm 1.16					
4	100G LH	SM	FUJITSU	FIM38500/222	1528.77 nm -
1568.36 nm 1.16					

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	
Firmware						
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	
Firmware						
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	
Firmware						
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 1 information:
  Type                1X100GE CFP
  State                Online
  PIC version          0.0
  Uptime               1 day, 2 hours, 19 minutes, 18 seconds

PIC port information:

  Port Cable type      Fiber      Xcvr vendor      Wave-      Xcvr
  0    100GBASE SR10    MM      Reflex Photonics CF-X12-C11801-50 860 nm     4.7

```

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      Xcvr vendor      Wavelength
  0    100GBASE 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
                                type  Xcvr vendor      part number      Wavelength
  ---  -
  0     OC48 short reach SM   FINISAR CORP.    FTRJ1321P1BTL-J2 1310 nm
  1     OC3 short reach  MM   OCP              TRPA03MM3BAS-JE 1310 nm
  2     OC3 short reach  MM   OCP              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	OPNEXT 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:
  Port  Cable type      Fiber type  Xcvr vendor  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:
```

Port	Cable type	Fiber type	Xcvr vendor	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 Access 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 power

List of Syntax	Syntax on page 1587 Syntax (MX Series Router) on page 1587 Syntax (MX2020 3D Universal Edge Routers) on page 1587 Syntax (PTX Series) on page 1587 Syntax (MX2010 3D Universal Edge Routers) on page 1587
Syntax	show chassis power
Syntax (MX Series Router)	show chassis power <all-members> <local> <member <i>member-id</i> > <detail>
Syntax (MX2020 3D Universal Edge Routers)	show chassis power <detail>
Syntax (PTX Series)	show chassis power <detail>
Syntax (MX2010 3D Universal Edge Routers)	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 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.
Description	(MX Series 3D Universal Edge Routers and PTX Series Packet Transport Routers only) Display power limits and usage information for the AC or DC power sources. <ul style="list-style-type: none"> On the MX Series 3D Universal Edge Routers, power is supplied by Power Entry Modules (PEMs).
<div>  <p>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.</p> </div>	
<ul style="list-style-type: none"> On the MX2020 3D Universal Edge Routers, 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 3D Universal Edge Routers, 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 router chassis does not provide redundancy for the critical FRUs because there is only one power zone.
- 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.

Options **none**—Display basic power usage information for the AC and DC power sources.

all-members—(MX Series routers only) (Optional) Display power usage information for all members of the Virtual Chassis configuration.

detail—(Optional) Include power usage for specific FRUs.

local—(MX Series routers only) (Optional) Display power usage information for the local Virtual Chassis member.

member *member-id*—(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 *member-id* with a value of 0 or 1.

Required Privilege Level view

Related Documentation

- [show chassis power sequence on page 1606](#)
- *Checklist for Monitoring Power Supplies*

List of Sample Output [show chassis power \(MX960 Router with DC PEM\) on page 1591](#)
[show chassis power \(MX960 Router with AC PEM\) on page 1592](#)
[show chassis power \(MX960 Router with MPC5EQ\) on page 1593](#)
[show chassis power detail \(MX960 Router with MPC5EQ\) on page 1593](#)
[show chassis power \(MX480 Router with AC PEM\) on page 1594](#)
[show chassis power \(MX240 Router with DC PEM\) on page 1595](#)
[show chassis power \(MX2010 Router\) on page 1595](#)
[show chassis power \(MX2020 Router\) on page 1596](#)

[show chassis power \(MX2020 Router with MPC5EQ and MPC6E\) on page 1598](#)
[show chassis power detail \(MX2020 Router with MPC5EQ and MPC6E\) on page 1600](#)
[show chassis power \(PTX5000 Packet Transport Router\) on page 1602](#)
[show chassis power \(PTX5000 Packet Transport Router with FPC2-PTX-P1A\) on page 1603](#)
[show chassis power detail \(PTX5000 Packet Transport Router\) on page 1603](#)
[show chassis power detail \(PTX5000 Packet Transport Router with FPC2-PTX-P1A\) on page 1604](#)

Output Fields [Table 110 on page 1589](#) lists the output fields for the **show chassis power** command. Output fields are listed in the approximate order in which they appear.

Table 110: show chassis power Output Fields

Field Name	Field Description	Level of Output
PEM number	<p>(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"> • State—State of the PEM: <ul style="list-style-type: none"> • Online—PEM is present in the slot and online. • Empty—PEM is not present in the slot. • Present—PEM is present in the slot, but not online. • AC/DC Input—OK or Check—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. • Capacity—Actual power input capacity with maximum capacity displayed (in parentheses) in watts. <p>NOTE: The maximum capacity for AC and DC PEMs is:</p> <ul style="list-style-type: none"> • MX960 AC PEM—4100 W if two feeds are connected. 1700 W if one feed is connected. • MX960 DC PEM—4100 W if two feeds are connected. 1700 W if one feed is connected. • MX480 AC PEM—2520 W if it is high-line. 1450 W if it is low-line. • MX480 DC PEM—2400 W if the DIP switch is off. 2600 W if the DIP switch is on. • MX240 AC PEM—2520 W if it is high-line. 1450 W if it is low-line. • MX240 DC PEM—2400 W if the DIP switch is off. 2600 W if the DIP switch is on. • DC Output—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.	All levels

Table 110: show chassis power Output Fields (*continued*)

Field Name	Field Description	Level of Output
System	<p>(MX Series, MX2020, and MX2010 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"> • <i>Zone number</i>: <ul style="list-style-type: none"> • Capacity—Maximum power capacity applicable for the zone, in watts. • Allocated power—Actual capacity allocated for the zone, in watts, with remaining power displayed in parentheses. • Actual usage—Actual power usage for the zone, in watts. • Total system capacity—Cumulative power capacity of all the zones, in watts. • Total remaining capacity—Difference between the Total system capacity and cumulative Allocated power of all the zones, in watts. <p>The following output fields are displayed for MX2010 and MX2020 routers:</p> <ul style="list-style-type: none"> • Capacity—Maximum power capacity applicable for the zone, in watts. • Allocated power—Actual capacity allocated for the zone, in watts, with remaining power displayed in parentheses. • Actual usage—Actual power usage for the zone, in watts. <p>NOTE: 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
Total Power	(PTX Series only) Total power used by the switch (displayed in watts).	All levels
PDU number	(PTX5000 only) ID number of the power distribution unit (PDU) on the chassis.	All levels

Table 110: show chassis power Output Fields (*continued*)

Field Name	Field Description	Level of Output
PSM number	<p>(PTX Series, MX2020 routers, and MX2010 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"> • Input (V)—Voltage supplied to the PSM. • Used (W)—Actual power usage for the PSM (measured in watts). <p>NOTE: Starting with Junos OS Release 14.1, no output is displayed for Input (v) and Used (W) fields for missing PSMs; unlike in earlier releases where 0 was displayed for missing PSMs.</p> <p>(MX2010 and MX2020 routers) The following output fields are displayed for each PSM:</p> <ul style="list-style-type: none"> • State—State of the PSM: <ul style="list-style-type: none"> • Online—PSM is present in the slot and online. • Empty—PSM is not present in the slot. • Present—PSM is present in the slot but not online. • DC Input—State of the DC input power feed with the number of active or expected feeds (in parentheses). • Capacity—Actual power input capacity and maximum capacity (in parentheses) displayed in watts. <p>NOTE: The maximum capacity for AC and DC PSMs is:</p> <ul style="list-style-type: none"> • MX2010/MX2020 AC PSM—2500 W. • MX2010/MX2020 DC PSM—2100 W if the DIP switch is at 60A settings. 2500 W if the DIP switch is at 80A settings. • DC Output—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.	All levels
Item	<p>Actual power usage (measured in watts) for the following FRUs:</p> <ul style="list-style-type: none"> • Fan Tray <i>n</i>—Power usage for the specified fan tray. • RE<i>n</i>/CB<i>n</i>—Power usage for the specified Routing Engines and Control Boards • SIB/CCG/FPD—Power usage for the Switch Interface Board, Centralized Clock Generator (PTX5000 only), and Front Panel Display (craft interface). • FPC <i>n</i>—Power usage for the FPC in the slot specified. <p>NOTE: MX Series routers must have a MPC5EQ MPC installed to view FRU power usage with the detail command.</p>	detail

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
  AC input:   OK (2 feed expected, 2 feed connected)
  Capacity:   4100 W (maximum 4100 W)
  DC output:  1140 W (zone 0, 20 A at 57 V, 27% 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: 1026 W (zone 0, 18 A at 57 V, 25% 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: 2166 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

Item	Used(W)
FPC 0	0
FPC 4	0
FPC 5	0
FPC 8	0
FPC 10	0

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 (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 sequence

Syntax	show chassis power sequence
Release Information	<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 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.</p>
Description	<p>(MX Series 3D Universal Edge Routers 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>
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> show chassis power on page 1587
List of Sample Output	<p>show chassis power sequence (MX Series) on page 1606</p> <p>show chassis power sequence (MX2010 Routers) on page 1606</p> <p>show chassis power sequence (MX2020 Routers) on page 1607</p> <p>show chassis power sequence (PTX5000 Packet Transport Router) on page 1607</p>
Output Fields	<p>Table 111 on page 1606 lists the output fields for the show chassis power sequence command. Output fields are listed in the approximate order in which they appear.</p>

Table 111: show chassis power sequence Output Fields

Field Name	Field Description
Chassis FRU Power Sequence	<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 1608](#)

Output Fields [Table 112 on page 1608](#) lists the output fields for the `show chassis psd` command. Output fields are listed in the approximate order in which they appear.

Table 112: show chassis psd Output Fields

Field Name	Field Description
Slot Description	PSD identification.
State	PSD status: <ul style="list-style-type: none"> • Online—PSD is online and running. • Offline—PSD is powered down.
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 <i>group-name</i> >
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	<p>none—Display information about the status of all configured FEB redundancy groups.</p> <p>redundancy-group <i>group-name</i>—(Optional) Display information about the specified configured redundancy group.</p> <p>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).</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • request chassis redundancy feb slot on page 744 • <i>Configuring FEB Redundancy on the M120 Router</i> • <i>Understanding Switching Control Board Redundancy</i>
List of Sample Output	show chassis redundancy feb on page 1611 show chassis redundancy feb redundancy-group grp1 on page 1611 show chassis redundancy feb redundancy-group grp0 errors on page 1611
Output Fields	Table 113 on page 1610 lists the output fields for the show chassis redundancy feb command. Output fields are listed in the approximate order in which they appear.

Table 113: 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"> • Online—FEB is online and running. • Offline—FEB is powered down.
Priority	(Standard and redundancy-group option) Status of FEB in the redundancy group: Backup , Primary , Other , or null.

Table 113: show chassis redundancy feb Output Fields (*continued*)

Field name	Field Description
Connected FPCs	(Standard and redundancy-group option) Slot number of each FPC connected to the FEB. The status Check is displayed when an error might have occurred.
Redundancy State	(Standard and redundancy-group option) Status of the FEB: <ul style="list-style-type: none"> • Active—FEB is currently active. • Ready—Backup FEB is ready for a switchover • Not Ready—Backup FEB is not ready for a switchover.
Auto-failover	(Standard and redundancy-group option) Automatic failover status of redundancy group: Enabled or Disabled .
Switch-reason	(Standard and redundancy-group option) Reason a switchover occurred to the backup FEB in the redundancy group.
Hard error: Yes	(errors option only) Displayed when a hard error occurs on a FEB.
FPC	(errors option only) Slot number and status of FPC: link ok or link error .
Fabric plane	(errors 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           5              Not ready
  1    Online          Backup           5              Active
Auto-failover:  Enabled
Group:          grp0
  FEB  State          Priority  Connected FPCs  Redundancy state
  3    Offline         Backup           0              Not ready
  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 1613](#)
 [Syntax \(ACX Series Universal Access Routers\) on page 1613](#)
 [Syntax \(EX Series Switches\) on page 1613](#)
 [Syntax \(QFX Series\) on page 1613](#)
 [Syntax \(MX Series Routers\) on page 1613](#)
 [Syntax \(MX2010 3D Universal Edge Routers\) on page 1613](#)
 [Syntax \(MX2020 3D Universal Edge Routers\) on page 1613](#)
 [Syntax \(MX104 3D Universal Edge Routers\) on page 1613](#)
 [Syntax \(PTX Series Packet Transport Routers\) on page 1613](#)
 [Syntax \(T Series Routers\) on page 1614](#)
 [Syntax \(TX Matrix Routers\) on page 1614](#)
 [Syntax \(TX Matrix Plus Routers\) on page 1614](#)

Syntax show chassis routing-engine
 <bios | *slot*>

Syntax (ACX Series Universal Access 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*>

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 3D Universal Edge Routers) show chassis routing-engine
 <bios | *slot*>

Syntax (MX2020 3D Universal Edge Routers) show chassis routing-engine
 <bios | *slot*>

Syntax (MX104 3D Universal Edge Routers) show chassis routing-engine

Syntax (PTX Series Packet Transport Routers) show chassis routing-engine

Syntax (T Series Routers)	<code>show chassis routing-engine</code> <code><bios | slot></code>
Syntax (TX Matrix Routers)	<code>show chassis routing-engine</code> <code><bios | slot></code> <code><lcc number | scc></code>
Syntax (TX Matrix Plus Routers)	<code>show chassis routing-engine</code> <code><bios | slot></code> <code><lcc number | sfc number></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>sfc option introduced for the TX Matrix Plus router in Junos OS Release in 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 Access Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.</p> <p>Command introduced in Junos OS Release 13.2 for MX104 3D Univesral Edge Routers.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p> <p>satellite option introduced in Junos OS Release 14.2R3.</p>
Description	Display the status of the Routing Engine.
Options	<p>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.</p> <p>all-members—(MX Series routers only) (Optional) Display Routing Engine information for all members of the Virtual Chassis configuration.</p> <p>bios—(Optional) Display the (BIOS) firmware version.</p> <p>interconnect-device number—(QFabric systems only) (Optional) Display Routing Engine information for a specified Interconnect device.</p> <p>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.</p> <p>Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none">• 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 745](#)
- *Configuring Routing Engine Redundancy*
- *Switching the Global Master and Backup Roles in a Virtual Chassis Configuration*

List of Sample Output

- [show chassis routing-engine \(M5 Router\) on page 1618](#)
- [show chassis routing-engine \(M10 Router\) on page 1619](#)
- [show chassis routing-engine \(M20 Router\) on page 1619](#)
- [show chassis routing-engine \(M40 Router\) on page 1620](#)
- [show chassis routing-engine \(M120 Router\) on page 1620](#)
- [show chassis routing-engine \(M160 Router\) on page 1621](#)
- [show chassis routing-engine \(MX104 Router\) on page 1622](#)
- [show chassis routing-engine \(MX240 Router\) on page 1622](#)
- [show chassis routing-engine \(MX480 Router\) on page 1623](#)
- [show chassis routing-engine \(MX960 Router\) on page 1624](#)
- [show chassis routing-engine \(MX2010 Router\) on page 1626](#)
- [show chassis routing-engine \(MX2020 Router\) on page 1626](#)
- [show chassis routing-engine \(T320 Router\) on page 1627](#)

[show chassis routing-engine \(T640 Router\) on page 1628](#)
[show chassis routing-engine \(T1600 Router\) on page 1629](#)
[show chassis routing-engine \(T4000 Router\) on page 1629](#)
[show chassis routing-engine \(TX Matrix Router\) on page 1630](#)
[show chassis routing-engine lcc \(TX Matrix Router\) on page 1631](#)
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[show chassis routing-engine \(EX9200 Switch\) on page 1636](#)
[show chassis routing-engine \(ACX2000 Universal Access Router\) on page 1637](#)
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Output Fields [Table 114 on page 1616](#) lists the output fields for the **show chassis routing-engine** command. Output fields are listed in the approximate order in which they appear.

Table 114: show chassis routing-engine Output Fields

Field Name	Field Description
Slot	(Systems with single and multiple Routing Engines) Slot number.
Current state	(Systems with multiple Routing Engines) Current state of the Routing Engine: Master , Backup , or Disabled .
Election priority	(Systems with multiple Routing Engines) Election priority for the Routing Engine: Master or Backup .
Temperature	Temperature of the air flowing past the Routing Engine.
CPU Temperature	Temperature of the CPU.
DRAM	<p>Total DRAM available to the Routing Engine's processor.</p> <p>Starting with Junos OS Release 12.3R1, the DRAM field displays both available memory and installed memory.</p>
Memory utilization	<p>Percentage of Routing Engine memory being used.</p> <p>NOTE: 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. For platforms that run Junos OS with upgraded FreeBSD, see <i>Understanding Junos OS with Upgraded FreeBSD</i>.</p>

Table 114: show chassis routing-engine Output Fields (*continued*)

Field Name	Field Description
CPU utilization	Information about the Routing Engine's CPU utilization: <ul style="list-style-type: none"> • User—Percentage of CPU time being used by user processes. • Background—Percentage of CPU time being used by background processes. • Kernel—Percentage of CPU time being used by kernel processes. • Interrupt—Percentage of CPU time being used by interrupts. • Idle—Percentage of CPU time that is idle.
5 sec CPU Utilization NOTE: Supported only on MX240, MX480, MX960, MX2010, and MX2020.	Information about the Routing Engine's CPU utilization in the past 5 seconds: <ul style="list-style-type: none"> • User—Percentage of CPU time being used by user processes. • Background—Percentage of CPU time being used by background processes. • Kernel—Percentage of CPU time being used by kernel processes. • Interrupt—Percentage of CPU time being used by interrupts. • Idle—Percentage of CPU time that is idle.
1 min CPU Utilization NOTE: Supported only on MX240, MX480, MX960, MX2010, and MX2020.	Information about the Routing Engine's CPU utilization in the past 1 minute: <ul style="list-style-type: none"> • User—Percentage of CPU time being used by user processes. • Background—Percentage of CPU time being used by background processes. • Kernel—Percentage of CPU time being used by kernel processes. • Interrupt—Percentage of CPU time being used by interrupts. • Idle—Percentage of CPU time that is idle.
5 min CPU Utilization NOTE: Supported only on MX240, MX480, MX960, MX2010, and MX2020.	Information about the Routing Engine's CPU utilization in the past 5 minutes: <ul style="list-style-type: none"> • User—Percentage of CPU time being used by user processes. • Background—Percentage of CPU time being used by background processes. • Kernel—Percentage of CPU time being used by kernel processes. • Interrupt—Percentage of CPU time being used by interrupts. • Idle—Percentage of CPU time that is idle.
15 min CPU Utilization NOTE: Supported only on MX240, MX480, MX960, MX2010, and MX2020.	Information about the Routing Engine's CPU utilization in the past 15 minutes: <ul style="list-style-type: none"> • User—Percentage of CPU time being used by user processes. • Background—Percentage of CPU time being used by background processes. • Kernel—Percentage of CPU time being used by kernel processes. • Interrupt—Percentage of CPU time being used by interrupts. • Idle—Percentage of CPU time that is idle.
Model	Routing Engine model number.
Serial ID	(Systems with multiple Routing Engines) Identification number of the Routing Engine in this slot.
Start time	Time at which the Routing Engine started running.
Uptime	How long the Routing Engine has been running.

Table 114: show chassis routing-engine Output Fields (*continued*)

Field Name	Field Description
Routing Engine BIOS Version	BIOS version being run by the Routing Engine.
Last reboot reason	Reason for last reboot, including: <ul style="list-style-type: none"> power cycle/failure—Halt of the Routing Engine using the halt 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 request system halt 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. watchdog—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. reset-button reset—(Not available on the EX Series switch) Reboot due to pressing of the reset button on the Routing Engine. power-button hard power off—Reboot due to pressing of the power button on the chassis. A powering down of the software also occurs if you enter the request system power-off command. You can enter this command to power down the chassis or specific Routing Engines; you can then restart the software. misc hardware reason—Reboot due to miscellaneous hardware reasons. thermal shutdown—Reboot due to the router or switch reaching a critical temperature at which point it is unsafe to continue operations. hard disk failure—Reboot due to a hard disk or solid-state drive (SSD) failure. reset from debugger—Reboot due to reset from the debugger. chassis control reset—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 restart chassis-control command. bios auto recovery reset—Reboot due to a BIOS auto-recovery reset. could not be determined—Reboot due to an undetermined reason. Router rebooted after a normal shutdown—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 request system reboot command. You can enter this command to reboot the chassis or specific Routing Engines.
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 (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 (T1600 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

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                  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

```

lcc2-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 (ACX2000 Universal Access 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 Access 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 scb

Syntax	show chassis scb
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M40 router only) Display System Control Board (SCB) status information.
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • <i>Checklist for Monitoring the SCB</i>
List of Sample Output	show chassis scb on page 1640
Output Fields	Table 115 on page 1639 lists the output fields for the show chassis scb command. Output fields are listed in the approximate order in which they appear.

Table 115: 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.
Internet Processor memory	Information about the memory of the Internet Processor ASIC on the SCB: <ul style="list-style-type: none"> • IP routes—Number of IP routes known to the Internet Processor. • MPLS routes—Number of MPLS routes known to the Internet Processor. • SRAM banks enabled—Which SRAM banks are enabled. • SRAM size—Size of SCB SRAM, in bytes. • SRAM used—Amount of SRAM used, in bytes. • SRAM utilization—Percentage of SRAM used.

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

Syntax	<pre>show chassis sfb <all-members> <local> <member <i>member-id</i>> < slot <i>sfb-slot-number</i>></pre>
Release Information	<p>Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers. all-members, local, and member <i>member-id</i> options introduced in Junos OS Release 15.1 for MX2020 and MX2010 routers.</p>
Description	Display chassis information about the Switch Fabric Board (SFB).
Options	<p>none—Display chassis information about all Switch Fabric Boards.</p> <p>all-members—(Optional) Display chassis information about the SFB in all members of the Virtual Chassis configuration.</p> <p>local—(Optional) Display chassis information about the SFB in the local member of the Virtual Chassis.</p> <p>member <i>member-id</i>—(Optional) Display chassis information about the SFB in the specified member of the Virtual Chassis. Replace <i>member-id</i> with the value 0 or 1.</p> <p><i>sfb-slot-number</i>—(Optional) Display chassis information about the specified Switch Fabric Board. For MX2020 and MX2010 routers, replace <i>sfb-slot-number</i> with a value from 0 through 7.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • request chassis sfb on page 752
List of Sample Output	<p>show chassis sfb (MX2020 Router) on page 1642</p> <p>show chassis sfb (MX2010 Router) on page 1642</p>
Output Fields	Table 116 on page 1641 lists the output fields for the show chassis sfb command. Output fields are listed in the approximate order in which they appear.

Table 116: show chassis sfb Output Fields

Field Name	Field Description
Slot	Slot number.
State	<p>Status of the SFB.</p> <ul style="list-style-type: none"> • Online—The SFB is online and running. • Offline— SFB is powered down.

Table 116: show chassis sfb Output Fields (*continued*)

Field Name	Field Description
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 sfm

Syntax	show chassis sfm <detail < <i>sfm-slot</i> >>
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M40e and M160 routers only) Display Switching and Forwarding Module (SFM) status information.
Options	<p>none—Display standard status information about all SFMs.</p> <p>detail—(Optional) Display detailed SFM status information.</p> <p><i>sfm-slot</i>—(Optional) Display status information about the SFM in the specified slot only. For the M40e router, replace <i>sfm-slot</i> with 0 or 1. For the M160 router, replace <i>sfm-slot</i> with a value from 0 through 3.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • request chassis sfm on page 754 • request chassis sfm master switch on page 753 • <i>Switching the Global Master and Backup Roles in a Virtual Chassis Configuration</i>
List of Sample Output	show chassis sfm (M160 Router) on page 1644 show chassis sfm detail (M40e Router) on page 1645 show chassis sfm detail (M160 Router) on page 1645
Output Fields	Table 117 on page 1643 lists the output fields for the show chassis sfm command. Output fields are listed in the approximate order in which they appear.

Table 117: show chassis sfm Output Fields

Field Name	Field Description	Level of Output
Slot	Slot number.	All levels
State	Status of the SFM. State can be any of the following: <ul style="list-style-type: none"> • Online—SFM is online and running. • Online-Standby (M40e router only)—SFM is online, operating as Standby. • Offline—SFM is powered down. • Empty—No SFM is present. 	All levels
Reason	If the status is Offline , reason for this state.	All levels
Temp	Temperature of air passing by the SFM, in degrees Celsius.	none specified
CPU Utilization (%)	Information about CPU usage.	none specified

Table 117: show chassis sfm Output Fields (*continued*)

Field Name	Field Description	Level of Output
Total	Total percentage of the CPU being used by the SFM's processor.	All levels
Interrupt	Of the total CPU being used by the SFM's processor, the percentage being used for interrupts.	All levels
Memory Utilization	Information about memory usage.	none specified
DRAM	Total DRAM available to the SFM's processor, in megabytes (MB).	All levels
Heap	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
Buffer	Percentage of buffer space being used by the SFM's processor for buffering internal messages.	All levels
SPP Temperature	Temperature of air passing by the Switch Plane Processor card, in degrees Celsius and Fahrenheit	detail
SPR Temperature	Temperature of air passing by the Switch Plane Router card, in degrees Celsius and Fahrenheit.	detail
Total CPU DRAM	Total amount of CPU DRAM being used by the SFM's processor.	detail
Total SSRAM	Total amount of SSRAM being used by the SFM's processor.	detail
Internet processor II	(M160 router only) Processor type.	detail
Start time	Time this SFM became active.	detail
Uptime	How long the SFM has been up and running.	detail
Packet scheduling mode	(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 Total	Utilization (%) Interrupt	Memory DRAM (MB)	Utilization (%) 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

List of Syntax	Syntax on page 1646 Syntax (TX Matrix Router) on page 1646 Syntax (TX Matrix Plus Router) on page 1646 Syntax (PTX Series Packet Transport Routers) on page 1646
Syntax	show chassis sibs
Syntax (TX Matrix Router)	show chassis sibs <lcc <i>number</i> | scc>
Syntax (TX Matrix Plus Router)	show chassis sibs <lcc <i>number</i> | sfc <i>number</i> >
Syntax (PTX Series Packet Transport Routers)	show chassis sibs <detail> <slot>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 12.1 for the PTX Series Packet Transport Routers. sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6. detail and sib-slot options introduced for the PTX Packet Transport Router in Junos OS Release 12.1
Description	(M320,T Series routers, TX Matrix routers, TX Matrix Plus routers, and PTX Series routers only) Display Switch Interface Boards (SIBs) status information.
Options	none —(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. detail —(PTX Series) (Optional) Display detailed SIB status information. lcc <i>number</i> —(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. Replace <i>number</i> with the following values depending on the LCC configuration: <ul style="list-style-type: none">• 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 755](#)
 - [show chassis spmb sibs on page 1667](#)
 - [show chassis environment sib on page 1022](#)
 - [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 1650](#)
 - [show chassis sibs \(T4000 Router\) on page 1650](#)
 - [show chassis sibs \(TX Matrix Router\) on page 1651](#)
 - [show chassis sibs \(T1600 Router\) on page 1651](#)
 - [show chassis sibs \(TX Matrix Plus Router\) on page 1651](#)
 - [show chassis sibs \(TX Matrix Plus Router with 3D SIBs\) on page 1652](#)
 - [show chassis sibs sfc \(TX Matrix Plus Router\) on page 1654](#)
 - [show chassis sibs lcc \(TX Matrix Plus Router\) on page 1655](#)
 - [show chassis sibs lcc \(TX Matrix Plus Router with 3D SIBs\) on page 1656](#)
 - [show chassis sibs \(M320 Router\) on page 1656](#)
 - [show chassis sibs \(PTX Series\) on page 1656](#)
 - [show chassis sibs \(PTX Series\) on page 1656](#)

Output Fields [Table 118 on page 1647](#) lists the output fields for the **show chassis sibs** command. Output fields are listed in the approximate order in which they appear.

Table 118: show chassis sibs Output Fields

Field Name	Field Description
Slot	SIB slot number.
Type	(TX Matrix Plus router only) SIB type.

Table 118: show chassis sibs Output Fields (*continued*)

Field Name	Field Description
Uptime	How long the SIB has been up and running.
State	<p>SIB status:</p> <ul style="list-style-type: none"> • Activating—SIB is coming online; this is a transitional state. • Deactivating—SIB is going offline; this is a transitional state. • Connected—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. • Disconnected—SIBs on all T640 routers on the TX Matrix router (switch-card chassis) are in the Disconnected 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 Disconnected state, because a SIB on the SFC has gone offline. <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"> • Online—SIB is operational and running. • Offline—SIB is powered down. <p>NOTE: If a SIB transitions to the Offline state, the command displays an appropriate reason in the output. For instance, if the SIB is taken offline using the request chassis sib command, the show chassis sibs command displays --- Offlined by cli command --- in the output.</p> <ul style="list-style-type: none"> • Spare—SIB is redundant and will move to active state if one of the working SIBs fails to pass traffic. <p>NOTE: Spare does not apply to PTX Series Packet Transport Routers, as there are no spare SIBs.</p> <ul style="list-style-type: none"> • Empty—No SIB is present. • Fault—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"> • All onboard fabric ASICs are not operational. • Fiber-optic connector faults. • FPC connector faults. • SIB midplane connector faults. • Check—SIB is in an alarmed state due to link errors or destination errors. A SIB can transition to the Check state from the online or spare state. <p>The Check state can be caused by the following reasons:</p> <ul style="list-style-type: none"> • Unsupported FPC installed on a router. • SIB not inserted properly (such as bent pins). • 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

Table 118: show chassis sibs Output Fields (*continued*)

Field Name	Field Description
	<p>a Packet Forwarding Engine cannot be reached on that plane or SIB, a destination error is reported against that SIB.</p> <p>NOTE: For SIBs in the Check state, the output displays some additional information:</p> <ul style="list-style-type: none"> In Junos OS Release 9.6 and later, the Check state message shows the number of Packet Forwarding Engines in the plane having destination errors. For example, Check (10 destination errors) 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 Check state because of link errors only, the Check state message shows Check (0 destination errors). In Junos OS Release 9.5 and earlier, the Check state message shows Check (destination errors) 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 Check state because of link errors only, the Check state message shows Check (no destination errors). <p>If the SIB is in a Check state, because of destination errors, the CLI displays an additional line in the output, use "show chassis fabric fpcs" and "show chassis fabric sibs" for more details.</p> <ul style="list-style-type: none"> 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"> Link errors caused by a link training failure at initialization time—The Packet Forwarding Engine does not use the SIB to send traffic. The show chassis fabric fpcs command shows Plane disabled as status for this link. Link errors caused by CRC errors detected at runtime—The Packet Forwarding Engine continues to use the SIB to send traffic. The show chassis fabric fpcs command shows Link error as the status for this link. <p>NOTE: The Check state does not apply to PTX Series Packet Transport Routers.</p> <ul style="list-style-type: none"> SFC Error—If an F13 SIB on the TX Matrix Plus router (SFC) transitions to the Fault 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 SFC Error state. This state indicates that the F13 SIB to which the LCC SIB is connected has errors. <p>NOTE: The Connected, Disconnected, and SFC Error states are only applicable to the SIBs on an LCC.</p> <ul style="list-style-type: none"> Invalid—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.

Table 118: show chassis sibs Output Fields (*continued*)

Field Name	Field Description
	NOTE: The Invalid state is applicable to TX Matrix Plus routers only.
Fabric links	<p>Indicates status of fabric links on the SIB.</p> <ul style="list-style-type: none"> • Active—All fabric links on SIB are active. Errors detected on the SIB's fabric links, if any, are reported in the Errors column. • Unused—All fabric links on the SIB are not used for fabric traffic.
Errors	<p>Indicates if there is any error on the SIB.</p> <ul style="list-style-type: none"> • None—No errors • Link Errors—Fabric link errors were found on SIB RX link. • Cell drops—Fabric cell drops were found on the SIB ASIC. • Link Errors, Cell drops—Both link errors and cell drops were detected on at least one of the SIB's fabric links. • Asic Errors—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.
Link Errors	indicate the number of links which are marked faulty because the errors on them have crossed threshold.
Cable Errors	Indicate the number of mandatory cables that are not connected, or in up state for that plane
Destination Errors	Indicate the number of destinations that are not reachable on this plane.

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
```

```
1cc0-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
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
2      Invalid
3      Online                SIB F13      NONE         NONE              1 hour,
53 minutes, 19 seconds
4      Empty
5      Invalid
6      Online                SIB F13      NONE         NONE              1 hour,
53 minutes, 8 seconds
7      Empty
8      Online                SIB F13      NONE         NONE              1 hour,
52 minutes, 57 seconds
9      Empty
10     Invalid
11     Online                SIB F13      NONE         NONE              1 hour,
52 minutes, 46 seconds
12     Empty
13     Invalid
14     Invalid
```

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
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
	21 hours, 56 minutes, 6 seconds			
3/2	Online SIB F2S	-n/a-	NONE	NONE
	21 hours, 56 minutes, 4 seconds			
3/4	Online SIB F2S	-n/a-	NONE	NONE
	21 hours, 56 minutes, 2 seconds			
3/6	Online SIB F2S	-n/a-	NONE	NONE
	21 hours, 56 minutes			
4/0	Online SIB F2S	-n/a-	NONE	NONE
	21 hours, 55 minutes, 24 seconds			
4/2	Online SIB F2S	-n/a-	NONE	NONE
	21 hours, 55 minutes, 22 seconds			
4/4	Online SIB F2S	-n/a-	NONE	NONE
	21 hours, 55 minutes, 20 seconds			
4/6	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
2      Invalid
3      Online          SIB F13       NONE         NONE                12 hours,
6 minutes, 22 seconds
4      Empty
5      Invalid
6      Online          SIB F13       NONE         NONE                12 hours,
6 minutes, 11 seconds
7      Empty
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

List of Syntax	Syntax on page 1657 Syntax (MX Series Routers) on page 1657 Syntax (T4000 Routers) on page 1657 Syntax (TX Matrix Routers) on page 1657 Syntax (TX Matrix Plus Routers) on page 1657
Syntax	show chassis spmb
Syntax (MX Series Routers)	show chassis spmb <all-members> <local> <member <i>member-id</i> >
Syntax (T4000 Routers)	show chassis spmb <sibs>
Syntax (TX Matrix Routers)	show chassis spmb <sibs> <lcc <i>number</i> | scc>
Syntax (TX Matrix Plus Routers)	show chassis spmb <sibs> <lcc <i>number</i> | sfc <i>number</i> >
Release Information	Command introduced before Junos OS Release 7.4. sibs option introduced for the T1600 and TX Matrix Plus routers in Junos OS Release 9.6. Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers. all-members , local , and member <i>member-id</i> options introduced in Junos OS Release 15.1 for MX2020 and MX2010 routers.
Description	(T Series routers, MX2010 and MX2020 routers only) Display Switch Processor Mezzanine Board (SPMB) status information.
Options	<p>none—(TX Matrix, TX Matrix Plus router, MX2010, and MX2020 routers only) 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 and MX2020 routers, display the SPMB status for the routers.</p> <p>all-members—(MX2010 and MX2020 routers only) (Optional) Display status information for the SPMB in all members of the Virtual Chassis configuration.</p> <p>lcc <i>number</i>—(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.</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—(MX2010 and MX2020 routers only) (Optional) Display status information for the SPMB in the local member of the Virtual Chassis.

member *member-id*—(MX2010 and MX2020 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 755](#)
- [request chassis spmb restart on page 764](#)
- [show chassis spmb sibs on page 1667](#)

List of Sample Output

- [show chassis spmb on page 1660](#)
- [show chassis spmb \(MX2010 Router\) on page 1660](#)
- [show chassis spmb \(MX2020 Router\) on page 1660](#)
- [show chassis spmb \(T4000 Router\) on page 1661](#)
- [show chassis spmb lcc \(TX Matrix Router\) on page 1661](#)
- [show chassis spmb scc \(TX Matrix Router\) on page 1661](#)
- [show chassis spmb \(T1600 Router\) on page 1661](#)
- [show chassis spmb sibs \(T1600 Router\) on page 1662](#)
- [show chassis spmb \(TX Matrix Plus Router\) on page 1662](#)
- [show chassis spmb lcc \(TX Matrix Plus Router\) on page 1663](#)
- [show chassis spmb scc \(TX Matrix Plus Router\) on page 1664](#)
- [show chassis spmb sibs \(TX Matrix Plus Router\) on page 1664](#)
- [show chassis spmb lcc \(TX Matrix Plus router with 3D SIBs\) on page 1666](#)
- [show chassis spmb sfc \(TX Matrix Plus router with 3D SIBs\) on page 1666](#)

Output Fields Table 119 on page 1659 lists the output fields for the **show chassis spmb** command. Output fields are listed in the approximate order in which they appear.

Table 119: 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"> • Online—SPMB is operational and running. • Offline—SPMB is powered down.
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.

Table 119: show chassis spmb Output Fields (*continued*)

Field Name	Field Description
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 (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 (TI600 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 0
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

List of Syntax	Syntax on page 1667 Syntax (TX Matrix Router) on page 1667 Syntax (TX Matrix Plus Router) on page 1667
Syntax	show chassis spmb sibs
Syntax (TX Matrix Router)	show chassis spmb sibs <lcc <i>number</i> | scc>
Syntax (TX Matrix Plus Router)	show chassis spmb sibs <lcc <i>number</i> | sfc <i>number</i> >
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>sfc option introduced for the TX Matrix Plus router in Junos OS Release 9.6.</p>
Description	(T Series routers only) Display Switch Processor Mezzanine Board (SPMB) Switch Interface Board (SIB) status information.
Options	<p>none—(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>lcc <i>number</i>—(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"> • 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. <p>scc—(TX Matrix router only) (Optional) Display SIB status information for the TX Matrix router (switch-card chassis).</p> <p>sfc—(TX Matrix Plus router only) (Optional) Display SIB status information for the TX Matrix Plus router (or switch-fabric chassis).</p>

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 1646](#)
- [request chassis sib on page 755](#)
- [request chassis spmb restart on page 764](#)

List of Sample Output

[show chassis spmb sibs \(T320 Router\) on page 1669](#)
[show chassis-spmb-sibs \(T1600 Router\) on page 1669](#)
[show chassis spmb sibs \(T4000 Router\) on page 1669](#)
[show chassis spmb sibs \(TX Matrix Router\) on page 1670](#)
[show chassis spmb sibs lcc \(TX Matrix Router\) on page 1670](#)
[show chassis spmb sibs scc \(TX Matrix Router\) on page 1670](#)
[show chassis spmb sibs \(TX Matrix Plus Router\) on page 1670](#)
[show chassis spmb sibs sfc \(TX Matrix Plus Router\) on page 1671](#)

Output Fields [Table 120 on page 1668](#) lists the output fields for the **show chassis spmb sibs** command. Output fields are listed in the approximate order in which they appear.

Table 120: show chassis spmb sibs Output Fields

Field Name	Field Description
Slot	<p>SIB slot number:</p> <ul style="list-style-type: none"> • T640 router, T1600 router or TX Matrix router—0 through 4 • TX Matrix Plus router: <ul style="list-style-type: none"> • TXP-F13 SIB Slots—0 through 16 • TXP-F2S SIB Slots —0 – 4/[0|2|4|6] • T320 router—0 through 2

Table 120: show chassis spmb sibs Output Fields (*continued*)

Field Name	Field Description
State	<p>SIB status:</p> <ul style="list-style-type: none"> • Disconnected—SIBs on all T640 routers on the TX Matrix router (switch-card chassis) are in the Disconnected 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 Disconnected state, because a SIB on the SFC has gone offline. • Online—SPMB is operational and running. • Offline—SPMB is powered down. • Spare—SIB is redundant and will move to active state if one of the working SIBs fail to pass traffic. • Empty—No SPMB is present. • Fault—SIB is in alarmed state where the SIB's plane is not operational for the following reasons: <ul style="list-style-type: none"> • On-board F-chip is not operational. • Fiber optic connector faults. • FPC connector faults. • SIB midplane connector faults. • Check—SIB is in alarmed state where the SIB's plane is partially operational for the following reasons: <ul style="list-style-type: none"> • SIB is not inserted properly. • Two or more links between the SIB and PFE fails.
Uptime	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

Syntax	<pre>show chassis synchronization <clock-module <(re0 | re1 | routing-engine (backup | both | local | master | other))>> <extensive> <backup | master> <interface <i>interface-name</i>></pre>
Release Information	<p>Command introduced in Junos OS Release 7.6 for M320 routers.</p> <p>Command introduced in Junos OS Release 8.3 for M40e routers.</p> <p>Command introduced in Junos OS Release 9.3 for M120 routers.</p> <p>Command introduced in Junos OS Release 10.2 for T320, T640, and T1600 routers.</p> <p>Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Routers.</p> <p>Command introduced in Junos OS Release 12.2 for ACX Series routers.</p> <p>clock-module option introduced in Junos OS Release 12.2.</p>
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	<p>clock-module—Display clock module information. You can optionally specify one of these Routing Engine qualifiers:</p> <p>re0—Routing Engine 0</p> <p>re1—Routing Engine 1</p> <p>routing-engine (backup | both | local | master | other)—Routing Engine type</p> <p>extensive—(Optional) Display clock synchronization information in detail.</p> <p>interface <i>interface-name</i>—(Optional) Display clock synchronization information for the specified interface.</p> <p>backup—(Optional) Display clock synchronization information about the backup clock.</p> <p>master— (Optional) Display clock synchronization information about the master clock.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • request chassis synchronization switch on page 768 • Configuring Clock Synchronization Interface on MX Series Routers on page 353 • show chassis synchronization (MX Series Routers) on page 1678 • <i>Supported Time Synchronization Standard</i> • <i>Configuring External Clock Synchronization for ACX Series Routers</i>
List of Sample Output	<p>show chassis synchronization on page 1675</p> <p>show chassis synchronization master on page 1675</p>

[show chassis synchronization backup on page 1675](#)
[show chassis synchronization extensive on page 1675](#)
[show chassis synchronization \(T320, T640, and T1600 Routers\) on page 1676](#)
[show chassis synchronization \(PTX Series Packet Transport Routers\) on page 1676](#)
[show chassis synchronization clock-module \(PTX Series Packet Transport Routers\) on page 1676](#)
[show chassis synchronization extensive \(ACX Series Routers\) on page 1677](#)

Output Fields [Table 121 on page 1674](#) lists the output fields for the **show chassis synchronization** command. Output fields are listed in the approximate order in which they appear. [show chassis synchronization](#) [show chassis synchronization](#) [show chassis synchronization](#)

Table 121: 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"> • backup—Source is currently the backup clock source. • master—Source is currently the master clock source. • Online-Master—(PTX Series Packet Transport Routers) Source is the master clock. Source is online. • Online-Standby—(PTX Series Packet Transport Routers) Source is the standby (backup) clock. Source is online.
Current clock state	<p>Indicates current source of external synchronization:</p> <ul style="list-style-type: none"> • internal—Source is providing its own clocking. • locked to master CB—(M320, M40e, and M120 routers) Source is locked to master clock source. • locked to master SCG—(T320, T640, and T1600 routers) Source is locked to master clock source. • locked to master CCG—(PTX Series Packet Transport Routers) Source is locked to master clock source.
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).
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	<p>Indicates priority of external clock sources:</p> <ul style="list-style-type: none"> • primary—Source is a primary reference. • secondary—Source is a secondary reference.
Deviation (in ppm)	<p>Current difference in clock timing, in ppm:</p> <ul style="list-style-type: none"> • measuring—Establishing source deviation. • number—Deviation in ppm.

Table 121: show chassis synchronization Output Fields (*continued*)

Field Name	Field Description
Last deviation (in ppm)	Previous difference in clock timing, in ppm: <ul style="list-style-type: none"> number—Deviation in ppm.
Status	Indicates status of external sources: <ul style="list-style-type: none"> present—Source is configured and present. qualified—Source is eligible for synchronization source.

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

```

show chassis synchronization extensive (ACX Series Routers)

```

user@host> show chassis synchronization extensive
Current clock status : Locked
Clock locked to      : Primary
Configured sources:
Interface           : ce1-0/0/4
Status              : Primary                               Index          : 132
Clock source state   : Clk qualified   Priority         : Default(8)
Configured QL        : PRC              ESMC QL         : Unknown
Clock source type    : ifd              Clock Event     : Clock locked
Kernel flags         : Up,pri,

```

show chassis synchronization (MX Series Routers)

Syntax	show chassis synchronization <clock-module <(re0 | re1 | routing-engine (backup | both | local | master | other))>> <extensive> <interface <i>interface-name</i> >
Release Information	Command introduced in Junos OS Release 10.4. clock-module option introduced in Junos OS Release 12.2. Command introduced in Junos OS Release 13.3 for MX2020 routers.
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, MX2010, and MX2020 routers with Enhanced MX Switch Control Board only) (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 353](#)
 - [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 372](#)
 - [request chassis synchronization mode on page 766](#)
 - [show chassis synchronization on page 1673](#)
 - [synchronization \(MX Series\) on page 672](#)
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- List of Sample Output**
- [show chassis synchronization on page 1684](#)
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 - [show chassis synchronization extensive \(Synchronous Ethernet with link down\) on page 1685](#)
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 - [show chassis synchronization extensive \(configured external clock interface\) on page 1686](#)
 - [show chassis synchronization clock-module \(configured external clock interfaces\) on page 1687](#)
 - [show chassis synchronization extensive \(configured external clock interface\) on page 1687](#)

Output Fields Table 122 on page 1680 lists the output fields for the **show chassis synchronization** command. Output fields are listed in the approximate order in which they appear.

Table 122: show chassis synchronization Output Fields

Field Name	Field Description	Level of Output
Current clock status	Indicates the current status of chassis synchronization: <ul style="list-style-type: none"> • Locked—Clock is operational. • Holdover—Clock is not operational. • Freerun—Clock is locked to the free-run local oscillator. 	none
Clock locked to	Indicates whether the clock is locked to either the primary source or the secondary source.	none

Table 122: show chassis synchronization Output Fields (*continued*)

Field Name	Field Description	Level of Output
Configured sources	Heading for the list of interfaces configured for chassis synchronization and their subsequent status indicators.	none
Source name	Indicates the configured interface that is the source. The external source name indicates the external clock interface.	none
Configured Priority	Indicates the priority configured for the interface.	none
Interface Status	Indicates the status of the interface as primary , secondary , or n/a (external).	none
Configured quality	Indicates the configured quality of the interface. <ul style="list-style-type: none"> • 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 	none
Interface	Indicates the configured interface: <ul style="list-style-type: none"> • ge-fpc/pic/port—Indicates the interface type and which FPC, PIC, and port are configured. 	extensive
Status	Indicates the synchronization status of the indicated interface, as follows: <ul style="list-style-type: none"> • Primary—This interface is the selected primary chassis clock source. • Secondary—This interface is the selected secondary chassis clock source. • n/a—This interface is not a selected clock source. 	extensive
Index	Unique numeric identifier for the established Synchronous Ethernet configuration.	extensive
Clock source state	Indicates the status of the Synchronous Ethernet clock source: <ul style="list-style-type: none"> • Clk qualified—The Synchronous Ethernet clock source is qualified. • n/a—The Synchronous Ethernet clock source is not qualified. 	extensive
Priority	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"> • Default(8)—The parameter is not specified. • -—The parameter is undefined or out of range. 	extensive

Table 122: show chassis synchronization Output Fields (*continued*)

Field Name	Field Description	Level of Output
Configured QL	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"> • prs | st2 | tnc | st3e | st3 | smc | st4—Network option I QLs • prc | ssu-a | ssu-b | sec—Network option II QLs 	extensive
ESMC QL	Indicates the configured Ethernet Synchronization Message Channel (ESMC) quality level: <ul style="list-style-type: none"> • DNU—Network option I source • DSU—Network option II source 	extensive
Clock source type	Indicates that the configured chassis synchronization clock source is one of the following types: <ul style="list-style-type: none"> • ifd—Uses the free-run local oscillator. • extern—Uses a configured qualified clock source. 	extensive
Clock Event	Indicates the event clock status: <ul style="list-style-type: none"> • Clock locked—Clock is established. • n/a—Clock is not established. 	extensive
Configuration flags	Indicates Ext for external interface configuration	
Wait-to-restore time	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.	extensive
Hold-off time	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.	extensive
Kernel flags	Indicates the Synchronous Ethernet software operational status: <ul style="list-style-type: none"> • Up—The Synchronous Ethernet software is operational for the configured interface. • pri—The source is the selected primary clock source. • Dn—The Synchronous Ethernet software is not operational for the configured interface. 	extensive

Table 122: 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"> • Link Down—The link between the Synchronous Ethernet interfaces is not operational. • Not restored—The Synchronous Ethernet link has not yet been restored because it is waiting for the specified wait-to-restore time to elapse. • Forbidden slot—Slot 10 is not supported. • Interface unit missing—The unit parameter is not set or is invalid. • Locked—The paired interface is not available. • No cfg—Synchronous Ethernet is not configured. • RX Disabled—The receiving interface is disabled. • Undefined/invalid QL—The QL mode is not specified in the configuration or, if specified, is not supported. • System initialization in progress—The remote system is performing initialization and not currently available for synchronization. • Unsupported interface—The configured interface does not support Synchronous Ethernet. 	extensive
Clock module on	Indicates whether the clock module is on the Switch Control Board SCB0 or SCB1 .	clock-module
Current role	<p>Indicates the role of the clock module:</p> <ul style="list-style-type: none"> • master—The clock module is on the primary SCB, which is the active chassis clock source. • backup—The clock module is on the backup SCB, which mirrors the state of the active clock. 	clock-module
Current state	<p>Indicates the state of the clock module:</p> <ul style="list-style-type: none"> • freerun—The clock module is in free-run mode. When the system starts up, the default clock module state is free-run. • acquiring-lock on—The clock module is attempting to acquire a lock on the specified clock source. • locked to—The clock module is locked to the specified clock source. • holdover on—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. • holdover—The clock module has transitioned into holdover prior to locking on a valid clock source and collecting holdover data. 	clock-module
Monitored clock sources	Displays information about monitored clock sources.	clock-module
Interface	<p>Indicates the interface type and which FPC, PIC, and port are configured:</p> <ul style="list-style-type: none"> • external—External clock source • ge-fpc/pic/port—Line Synchronous Ethernet or PTP slave • xe-fpc/pic/port—Line Synchronous Ethernet or PTP slave 	clock-module

Table 122: show chassis synchronization Output Fields (*continued*)

Field Name	Field Description	Level of Output
Type	Indicates the type of clock source: <ul style="list-style-type: none"> t1—BITS T1 framed e1—BITS E1 framed 2048khz—BITS unframed 2048 KHz frequency source syncE—Synchronous Ethernet frequency source ptp—PTP slave source ptp-hybrid—PTP slave source using Synchronous Ethernet for frequency 	clock-module
Status	Indicates the status of the clock source: <ul style="list-style-type: none"> failed—The clock source is in the failed state. qualifying—The clock source is being qualified. qualified—The clock source is qualified and can be selected as the chassis clock source. qualified-selected—The clock source is qualified and selected as the chassis clock source. 	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 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 1688 Syntax (TX Matrix Routers) on page 1688 Syntax (TX Matrix Plus Routers) on page 1688 Syntax (MX Series Routers) on page 1688 Syntax (MX104, MX2010, and MX2020 3D Universal Edge Routers) on page 1688 Syntax (QFX Series) on page 1688 Syntax (PTX Series) on page 1688
Syntax	show chassis temperature-thresholds
Syntax (TX Matrix Routers)	show chassis temperature-thresholds <fcc number | scc>
Syntax (TX Matrix Plus Routers)	show chassis temperature-thresholds <fcc 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, MX2010, and MX2020 3D Universal Edge Routers)	show chassis temperature-thresholds
Syntax (QFX Series)	show chassis temperature-thresholds <interconnect-device name> <node-device name>
Syntax (PTX Series)	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 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 12.1 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 MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers. Command introduced in Junos OS Release 13.2 for MX104 3D Universal Edge Routers. satellite option introduced in Junos OS Release 14.2R3.
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

Related Documentation

- *Defining Alarm Thresholds for System Temperature Sensors*

List of Sample Output

[show chassis temperature-thresholds on page 1691](#)

[show chassis temperature-thresholds \(MX104 Router\) on page 1691](#)
[show chassis temperature-thresholds \(MX240, MX480, MX960 Routers with Application Services Modular Line Card\) on page 1692](#)
[show chassis temperature-thresholds \(MX480 Router with MPC4E\) on page 1692](#)
[show chassis temperature-thresholds \(MX2010 Router\) on page 1692](#)
[show chassis temperature-thresholds \(MX2020 Router\) on page 1695](#)
[show chassis temperature-thresholds \(MX2020 Router with MPC4E\) on page 1698](#)
[show chassis temperature-thresholds \(T4000 Core Routers\) on page 1699](#)
[show chassis temperature-thresholds \(TX Matrix Plus Router\) on page 1700](#)
[show chassis temperature-thresholds lcc \(TX Matrix Plus Router\) on page 1701](#)
[show chassis temperature-thresholds sfc \(TX Matrix Plus Router\) on page 1701](#)
[show chassis temperature-thresholds \(TX Matrix Plus routers with 3D SIBs\) on page 1702](#)
[show chassis temperature-thresholds \(QFX3500 Switch and QFX3600\) on page 1703](#)
[show chassis temperature-thresholds interconnect-device \(QFabric System\) on page 1704](#)
[show chassis temperature-thresholds \(PTX5000 Packet Transport Router\) on page 1704](#)
[show chassis temperature-thresholds \(PTX1000 Packet Transport Router\) on page 1706](#)
[show chassis temperature-thresholds \(MX Routers with Media Services Blade \[MSB\]\) on page 1706](#)

Output Fields [Table 123 on page 1690](#) lists the output fields for the **show chassis temperature-thresholds** command. Output fields are listed in the approximate order in which they appear.

Table 123: 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>NOTE: On the QFX3500 switch and QFX3600 switch, there are four fan speeds: low, medium-low, medium-high, and high. 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"> • 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. <p>NOTE: On a TX Matrix Plus router with 3D SIBs, the threshold temperature at the XF junction is set to 70°C for Normal fan speed, which is less than or equal to 4800 RPM.</p> <ul style="list-style-type: none"> • High—The fans operate at high speed if the component has exceeded this temperature or a fan has failed or is missing. <p>NOTE: On a TX Matrix Plus router with 3D SIBs, the threshold temperature at the XF junction is set to 75°C for High fan speed, which is greater than or equal to 5000 RPM.</p> <p>NOTE: 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>

Table 123: show chassis temperature-thresholds Output Fields (*continued*)

Field name	Field Description
Yellow alarm	<p>Temperature threshold settings, in degrees Celsius, that trigger a yellow alarm.</p> <ul style="list-style-type: none"> • Normal—The temperature that must be exceeded on the component to trigger a yellow alarm when the fans are running at full speed. • 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.
Red alarm	<p>Temperature threshold settings, in degrees Celsius, that trigger a red alarm.</p> <ul style="list-style-type: none"> • Normal—The temperature that must be exceeded on the component to trigger a red alarm when the fans are running at full speed. • 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.
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 (MX104 Router)

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

Item	Fan speed	Yellow alarm		Red alarm		Fire Shutdown	
	(degrees C)	(degrees C)	(degrees C)	(degrees C)	(degrees C)	(degrees C)	
Normal	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      Yellow alarm    Red alarm      Fire Shutdown
                (degrees C)    (degrees C)    (degrees C)    (degrees C)
(degrees C)
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      Yellow alarm    Red alarm      Fire Shutdown
                (degrees C)    (degrees C)    (degrees C)    (degrees C)
(degrees C)
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
Fan speed      Yellow alarm    Red alarm      Fire Shutdown
                (degrees C)    (degrees C)    (degrees C)    (degrees C)
Item
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	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

```

	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
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 (T4000 Core Routers)

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

Item	Fan speed		Yellow alarm		Red alarm		Fire Shutdown
	(degrees C)		(degrees C)		(degrees C)		(degrees C)
	Normal	High	Normal	Bad fan	Normal	Bad fan	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		Yellow alarm		Red alarm	
	(degrees C)		(degrees C)		(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		Yellow alarm		Red alarm	
	(degrees C)		(degrees C)		(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		Yellow alarm		Red alarm		Fire
	(degrees C)		(degrees C)		(degrees C)		
	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 107	70	75	82	74	105	100
SIB F2S 18 Board 95	60	65	78	75	85	80
SIB F2S 18 XF Junction 107	70	75	82	74	105	100
SIB F2S 19 Board 95	60	65	78	75	85	80
SIB F2S 19 XF Junction 107	70	75	82	74	105	100
SIB F2S 24 Board 95	60	65	78	75	85	80
SIB F2S 24 XF Junction 107	70	75	82	74	105	100
SIB F2S 25 Board 95	60	65	78	75	85	80
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)		(degrees C)		
Item	Normal	High	Normal	Bad fan	Normal	Bad fan	
Normal							
Chassis default	48	54	65	55	75	65	
100							
Routing Engine 0	55	65	85	85	100	100	
102							
FPC 0	63	68	75	70	90	83	
95							
FPC 1	56	62	75	63	83	76	
95							
FPC 7	56	62	75	63	83	76	
95							
SIB 0	64	70	76	72	87	84	
95							
SIB 0 ASIC Junction	63	68	75	70	105	100	
107							
SIB 2	64	70	76	72	87	84	
95							
SIB 2 ASIC Junction	63	68	75	70	105	100	
107							
SIB 3	64	70	76	72	87	84	
95							
SIB 3 ASIC Junction	63	68	75	70	105	100	
107							

show chassis temperature-thresholds (QFX3500 Switch and QFX3600)

user@switch> 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
rmal						
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
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
```

	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							
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	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							
FPC 0 Intake Temp Sensor 75	30	65	65	65	70	70	
FPC 0 Exhaust Temp Sensor 75	30	65	65	65	70	70	
FPC 0 Mezz Temp Sensor 0 75	30	65	65	65	70	70	
FPC 0 Mezz Temp Sensor 1 75	30	65	65	65	70	70	
FPC 0 PE2 Temp Sensor 103	50	90	90	90	100	100	
FPC 0 PE1 Temp Sensor 103	50	90	90	90	100	100	
FPC 0 PF0 Temp Sensor 103	50	90	90	90	100	100	
FPC 0 PE0 Temp Sensor 103	50	90	90	90	100	100	
FPC 0 PE5 Temp Sensor 103	50	90	90	90	100	100	
FPC 0 PE4 Temp Sensor 103	50	90	90	90	100	100	
FPC 0 PF1 Temp Sensor 103	50	90	90	90	100	100	
FPC 0 PE3 Temp Sensor 103	50	90	90	90	100	100	
FPC 0 CPU Die Temp Sensor 103	50	90	90	90	100	100	
FPC 0 OCX0 Temp Sensor 103	50	90	90	90	100	100	

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 100	48	54	65	55	75	65
Routing Engine 0 112	70	80	95	95	110	110
Routing Engine 1 112	70	80	95	95	110	110
FPC 0 95	55	60	75	65	90	80
FPC 1 95	55	60	75	65	90	80
FPC 2 95	55	60	75	65	90	80
FPC 4	55	60	75	65	90	80

95							
FPC 5		55	60	75	65	90	80
95							

show chassis zones (PTX Series Packet Transport Routers)

Syntax	<code>show chassis zones</code> <code><detail></code>
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	<ul style="list-style-type: none"> • show chassis fan on page 1092 • show chassis temperature-thresholds on page 1688
List of Sample Output	show chassis zones (PTX5000 Packet Transport Router) on page 1708 show chassis zones detail (PTX5000 Packet Transport Router) on page 1709
Output Fields	Table 124 on page 1708 lists the output fields for the show chassis zones detail command.

Table 124: show chassis zones detail Output Fields

Field Name	Field Description
Item	Chassis component: <ul style="list-style-type: none"> • (PTX Series Packet Transport Routers)—Information about the chassis, Routing Engines, Control Boards (CBs), Switch Interface Boards (SIBs), PICs, and Flexible PIC Concentrators (FPCs).
Status	Status of the specified item. Status can be OK , Absent , or Offline .
Measurement	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 1710 Syntax (MX Series Routers) on page 1710 Syntax (QFX Series) on page 1710
Syntax	show chassis zones <detail>
Syntax (MX Series Routers)	show chassis zones <detail> <all-members> <local> <member <i>member-id</i> >
Syntax (QFX Series)	show chassis zones <detail> <interconnect-device <i>name</i> >
Release Information	Command introduced in Junos OS Release 11.3 for the QFX Series. Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers. Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers. all-members , local , and member <i>member-id</i> options introduced in Junos OS Release 15.1 for MX2020 and MX2010 routers.
Description	<p>(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.</p> <p>(MX2010 and MX2020 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.</p>
Options	<p>all-members—(MX2010 and MX2020 routers only) (Optional) Display the status of the cooling system zones in all members of the Virtual Chassis configuration.</p> <p>detail—(MX2010 and MX2020 routers only) (Optional) Display detailed status of the cooling system zones.</p> <p>detail <i>device-name</i>— (QFabric systems only) (Optional) Display detailed status of the two cooling systems on the Interconnect device.</p> <p>interconnect-device <i>name</i>— (QFabric systems only) (Optional) Display the status of the cooling zones on the Interconnect device.</p> <p>local—(MX2010 and MX2020 routers only) (Optional) Display the status of the cooling system zones in the local member of the Virtual Chassis.</p>

member *member-id*—(MX2010 and MX2020 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 1092](#)
- [show chassis temperature-thresholds on page 1688](#)

List of Sample Output

- [show chassis zones interconnect-device \(QFabric System\) on page 1712](#)
- [show chassis zones \(MX2010 Router\) on page 1712](#)
- [show chassis zones detail \(MX2010 Router\) on page 1712](#)
- [show chassis zones \(MX2020 Router\) on page 1713](#)
- [show chassis zones detail \(MX2020 Router\) on page 1713](#)
- [show chassis beacon interconnect-device \(QFabric System\) on page 1715](#)
- [show chassis beacon interconnect-device fpc \(QFabric System\) on page 1715](#)
- [show chassis beacon node-device \(QFabric System\) on page 1715](#)
- [show chassis beacon node-device fpc \(QFabric System\) on page 1715](#)

Output Fields Table 125 on page 1711 lists the output fields for the **show chassis zones** command. Output fields are listed in the approximate order in which they appear.

Table 125: 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"> • Off—The beacon is OFF. • On—The beacon is ON.
show chassis zones command output fields for MX2020 and MX2010 routers:	
Driving FRU	Field replacable unit (FRU).
Temperature	Temperature of the specified FRU in degrees Celsius and degrees Fahrenheit.
Condition	Condition of the specified FRU. Condition can be HIGH TEMP , WARM TEMP , OK , and Offline .
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 and MX2010 routers:	

Table 125: show chassis zones Output Fields (*continued*)

Field Name	Field Description
Item	Chassis component: <ul style="list-style-type: none"> Information about the chassis, Routing Engines, Control Boards (CBs), Switch Fabric Boards (SFBs), PICs, Flexible PIC Concentrators (FPCs), and Adapter Cards (ADCs).
Measurement	Fan tray speed utilization in percentage.
Status	Status of the specified item. Status can be OK , Absent , or Offline .

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 > 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 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

Syntax	show pfe cfep
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M7i routers only) Display Packet Forwarding Engine Compact Forwarding Engine Board (CFEB) status and statistics information.
Options	This command has no options.
Required Privilege Level	admin
List of Sample Output	show pfe cfep on page 1717
Output Fields	Table 126 on page 1716 lists the output fields for the show pfe cfep command. Output fields are listed in the approximate order in which they appear.

Table 126: show pfe cfep Output Fields

Field Name	Field Description
CFEB status	<p>Status of CFEB:</p> <ul style="list-style-type: none"> Slot—CFEB slot number. State—Status of the CFEB: <ul style="list-style-type: none"> Online—CFEB is online and running. Offline—CFEB is powered down. Last State Change—Date and time the CFEB state last changed. 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. Failures—Number of PFE Peer detach failures. Pending—Number of messages waiting to be sent. Policer Drop Probability—Current policer drop probability. The default is high, and can be configured using the policer-drop-probability-low statement.
Peer message type receive qualifiers	<ul style="list-style-type: none"> Message Type—IPC Message Type. For example, interface and nexthop. Receive Qualifier – Message receive qualifier for a peer (non-None only): <ul style="list-style-type: none"> All Only this slot Selective slot

Table 126: show pfe cfep Output Fields (*continued*)

Field Name	Field Description
PFE listener statistics	PFE listener statistics: <ul style="list-style-type: none"> • Open—Number of times a peer was opened. • Close—Number of times a peer was closed. • Sleep—Number of times a thread slept. • Wakeup—Number of times wakeup was issued. • Resync Request—Number of resync requests. • Resync Done—Number of successful resyncs. • Resync Fail—Number of failed resyncs. • Resync Time—Time the resync last happened.
PFE IPC statistics	<ul style="list-style-type: none"> • type—IPC Message Type. • TX Messages—Number of Tx messages. • RX Messages—Number of Rx messages.
PFE socket-buffer mbuf depth	<ul style="list-style-type: none"> • bucket—Bucket number. • count—Number of messages in the bucket.
PFE socket-buffer bytes pending transmit	<ul style="list-style-type: none"> • bucket—Bucket number. • count—Number of bytes pending transmit.

Sample Output

show pfe cfep

```

user@host> show pfe cfep
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

Syntax	show pfe feb
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M5 and M10 routers only) Display Packet Forwarding Engine Forwarding Engine Board (FEB) status and statistics information.
Options	This command has no options.
Required Privilege Level	admin
List of Sample Output	show pfe feb on page 1721 show pfe feb on page 1723
Output Fields	Table 127 on page 1720 lists the output fields for the show pfe feb command. Output fields are listed in the approximate order in which they appear.

Table 127: show pfe feb Output Fields

Field Name	Field Description
FEB status	<p>Status of FEB:</p> <ul style="list-style-type: none"> Slot—FEB slot number. State—State of the FEB: <ul style="list-style-type: none"> Offline—FEB is powered down. Online—FEB is operational and running. 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"> FEB is not inserted properly. Two or more links between the FEB and Packet Forwarding Engine fail. Last State Change—Date and time the CFEB state last changed. 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. Failures—Number of PFE Peer detach failures. Pending—Number of messages waiting to be sent. Policer Drop Probability—Current policer drop probability. The default is high, and can be configured using the policer-drop-probability-low statement.
Peer message type receive qualifiers	<ul style="list-style-type: none"> Message Type—IPC Message Type. For example, interface and nexthop. Receive Qualifier – Message receive qualifier for a peer (non-None only): <ul style="list-style-type: none"> All Only this slot Selective slot

Table 127: show pfe feb Output Fields (*continued*)

Field Name	Field Description
PFE listener statistics	PFE listener statistics: <ul style="list-style-type: none"> • Open—Number of times a peer was opened. • Close—Number of times a peer was closed. • Sleep—Number of times a thread slept. • Wakeup—Number of times wakeup was issued. • Resync Request—Number of resync requests. • Resync Done—Number of successful resyncs. • Resync Fail—Number of failed resyncs. • Resync Time—Time the resync last happened.
PFE IPC statistics	<ul style="list-style-type: none"> • type—IPC Message Type. • TX Messages—Number of Tx messages. • RX Messages—Number of Rx messages.
PFE socket-buffer mbuf depth	<ul style="list-style-type: none"> • bucket—Bucket number. • count—Number of messages in the bucket.
PFE socket-buffer bytes pending transmit	<ul style="list-style-type: none"> • bucket—Bucket number. • count—Number of bytes pending transmit.

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 1726 Syntax (TX Matrix and TX Matrix Plus Router) on page 1726 Syntax (MX Series Router) on page 1726
Syntax	<code>show pfe fpc slot</code> <detail | extensive>
Syntax (TX Matrix and TX Matrix Plus Router)	<code>show pfe fpc</code> <lcc <i>number</i> >
Syntax (MX Series Router)	<code>show pfe fpc slot</code> <detail | extensive> <all-members> <local> <member <i>member-id</i> >
Release Information	Command introduced before Junos OS Release 7.4.
Description	Display Packet Forwarding Engine statistics for the specified Flexible PIC Concentrator (FPC).
Options	<p>slot—FPC slot number. Replace slot with a value from 0 through 2.</p> <p>detail | extensive—(Optional) Display the specified level of detail.</p> <p>all-members—(MX Series routers only) (Optional) Display Packet Forwarding Engine statistics for the specified FPC in all members of the Virtual Chassis configuration.</p> <p>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.</p> <p>Replace <i>number</i> with the following values depending on the LCC configuration:</p> <ul style="list-style-type: none">• 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. <p>local—(MX Series routers only) (Optional) Display Packet Forwarding Engine statistics for the specified FPC in the local Virtual Chassis member.</p>

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 1729](#)
[show pfe fpc lcc on page 1730](#)
[show pfe fpc 0 detail on page 1732](#)
[show pfe fpc 0 \(MX 960 with DPC\) on page 1734](#)

Output Fields [Table 128 on page 1727](#) lists the output fields for the **show pfe fpc** command. Output fields are listed in the approximate order in which they appear.

Table 128: show pfe fpc Output Fields

Field Name	Field Description
FPC 1 status	<p>Status of FPC 1:</p> <ul style="list-style-type: none"> • Slot—FPC slot number – 1. • State—State of FPC1: <ul style="list-style-type: none"> • Dead—Held in reset because of errors. • Diag—Slot is being ignored while the FPC is running diagnostics. • Dormant—Held in reset. • Empty—No FPC is present. • Online—FPC is online and running. • 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. • Probed—Probe is complete; awaiting restart of the Packet Forwarding Engine (PFE). • Probe-wait—Waiting to be probed. • Last State Change—Date and time the FPC state last changed. • 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. • Failures—Number of PFE Peer detach failures. • Pending—Number of messages waiting to be sent. • Memory Enhanced Route—Reallocation of the jtree memory on the Packet Forwarding Engine to allocate more memory for routing tables. Can be configured with the memory-enhanced statement.

Table 128: show pfe fpc Output Fields (*continued*)

Field Name	Field Description
PFE listener statistics	PFE listener statistics: <ul style="list-style-type: none"> • Open—Number of times a peer was opened. • Close—Number of times a peer was closed. • Sleep—Number of times a thread slept. • Wakeup—Number of times wakeup was issued. • Resync Request—Number of resync requests. • Resync Done—Number of successful resyncs. • Resync Fail—Number of failed resyncs. • Resync Time—Time the resync last happened.
PFE IPC statistics	<ul style="list-style-type: none"> • type—IPC Message Type. • TX Messages—Number of Tx messages. • RX Messages—Number of Rx messages.
GFPC 0 status	Status of GFPC 0: <ul style="list-style-type: none"> • Slot—GFPC slot number – 0. • State—State of GFPC. • Last State Change—Date and time the GFPC state last changed.
Peer message type receive qualifiers [non-NONE(s) only]	<ul style="list-style-type: none"> • IPC Msg Type—IPC Message Type. For example, interface, nexthop. • Receive Qualifier—Message receive qualifier for a peer (non-NONE(s) only):
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"> • Open—Number of times a peer was opened. • Close—Number of times a peer was closed. • Sleep—Number of times a thread slept. • Wakeup—Number of times wakeup was issued. • Resync Request—Number of resync requests. • Resync Done—Number of successful resyncs. • Resync Fail—Number of failed resyncs. • Resync Time—Time the resync last happened.
PFE IPC statistics	<ul style="list-style-type: none"> • type—IPC Message Type. • TX Messages—Number of Tx messages. • RX Messages—Number of Rx messages.
PFE socket-buffer mbuf depth	<ul style="list-style-type: none"> • bucket—Bucket number. • count—Number of messages in the bucket.
PFE socket-buffer bytes pending transmit	<ul style="list-style-type: none"> • bucket—Bucket number. • count—Number of bytes pending transmit.

Table 128: 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"> Slot—GFPC slot number – 2. State—State of GFPC. Last State Change—Date and time the GFPC state last changed. Memory Enhanced Route—Reallocation of the jtree memory on the Packet Forwarding Engine to allocate more memory for routing tables. Can be configured with the memory-enhanced statement.
XDPC status	<p>XDPC status:</p> <ul style="list-style-type: none"> Slot—Present or empty. State—Online or offline. Last State Change—Date and time the DPC state last changed. Uptime (total)—Length of time the DPC has been online. Failures—Number of DPC failures. Pending—Number of messages waiting to be sent. Memory Enhanced Route—Reallocation of the jtree memory on the Packet Forwarding Engine to allocate more memory for routing tables. Can be configured with the memory-enhanced statement. Policer Drop Probability—Current policer drop probability. The default is high, and can be configured using the policer-drop-probability-low statement.

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> 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	(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)	All
Interface	(173)	All
Interface	(174)	All
Interface	(175)	All
Interface	(176)	All
Interface	(177)	All
Interface	(178)	All
Interface	(179)	All
Interface	(180)	All
Interface	(181)	All
Interface	(182)	All
Interface	(183)	All
Interface	(184)	All
Interface	(185)	All

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)	A11
Interface	(234)	A11
Interface	(235)	A11
Interface	(236)	A11
Interface	(237)	A11
Interface	(238)	A11
Interface	(239)	A11
Next-hop	(0)	A11
Next-hop	(1)	A11
Next-hop	(2)	A11
Next-hop	(3)	A11
Next-hop	(4)	A11
Next-hop	(5)	A11
Next-hop	(6)	A11
Next-hop	(7)	A11
Next-hop	(8)	A11

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	<ul style="list-style-type: none">• fib-remote on page 231• fib-local on page 230• Example: Configuring Packet Forwarding Engine FIB Localization on page 226

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 clock

Syntax	show ptp clock
Release Information	Command introduced in Junos OS Release 12.2. Command introduced in Junos OS Release 12.3 for ACX Series Routers.
Description	(ACX Series, MX80, MX240, MX480, and MX960 routers) Display the details of the clock configured on the node.
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • IEEE 1588v2 PTP Boundary Clock Overview • IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers • Precision Time Protocol Overview on page 163
List of Sample Output	show ptp clock on page 1746 show ptp clock (ACX Series Routers) on page 1747
Output Fields	Table 129 on page 1745 lists the output fields for the show ptp clock command. Output fields are listed in the approximate order in which they appear.

Table 129: 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: True or False .
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.
Log Variance	Represents an estimate of the variations of the local clock when it is not synchronized via PTP to another clock.
Clock Priority ¹	Priority value of the clock. Lower value takes precedence.

Table 129: show ptp clock Output Fields (*continued*)

Field Name	Field Description
Clock Priority2	Prioritize the masters to avoid confusion when the Clock Priority1 value is the same for different masters in a network.
UTC Offset	Offset between International Atomic Time (TAI) and Coordinated Universal Time (UTC) times. The value is 34 seconds as of January 2012.
Leap59	When TRUE , the last minute of the current UTC day has only 59 seconds (instead of the 60 SI seconds).
Leap61	When TRUE , the last minute of the current UTC day has 61 seconds (instead of the 60 SI seconds).
Time Traceable	When TRUE , the timescale and the UTC offset are traceable to a primary reference.
Frequency Traceable	When TRUE , frequency determining the timescale is traceable to a primary reference.
Time Source	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.
Delay Req Sending Time	Interval in seconds between the delay-request messages sent by the slave to the master.
Steps Removed	Number of boundary clocks between the local clock and the foreign master clock.
Slave-only	Set to TRUE , when the system is used in ordinary slave clock mode; otherwise, FALSE .
Parent Id	EUI-64 clock identifier of the immediate upstream master clock.
GMC Id	EUI-64 clock identifier of the grandmaster clock.
GMC Class	Denotes the grandmaster clock's traceability of the distributed time or frequency.
GMC Accuracy	Indicates the expected accuracy of the grandmaster clock.
GMC Variance	Represents an estimate of the variations of the grandmaster clock.
GMC Priority1	Priority1-value of the grandmaster clock.
GMC Priority2	Priority2-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
00:05:85:ff:fe:73:ef:d0
Total Ports on Device : 0
Clock Accuracy      : 49
Clock Priority1     : 128
UTC Offset          : 33
Leap61             : FALSE
Frequency Traceable : FALSE
Delay Req Sending Time: 0
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 Accuracy       : 254
GMC Priority1      : 0
Global Data:
UTC Offset         : 34
Leap-61           : FALSE
Freq Traceable     : FALSE
Time master        : 160

Clock Identity :
Clock Class      : 255
Log Variance     : -12944
Clock Priority2: 128
Leap59           : FALSE
Time Traceable   : FALSE
Time master      : 0
Steps Removed    : 1

GMC Class        : 52
GMC Variance     : 11952
GMC Priority2     : 0

Leap-59          : FALSE
Time traceable   : FALSE
Time Scale       : FALSE

```

show ptp clock (ACX Series Routers)

```

user@host> run show ptp clock
Clock Details:
Slot Number      : 0
Default Data:
Two-step Clock   : FALSE
84:18:88:ff:fe:c0:7a:00
Total Ports on Device : 0
Clock Accuracy   : 34
Clock Priority1  : 128
UTC Offset       : 0
Leap61          : FALSE
Frequency Traceable : FALSE
Delay Req Sending Time: 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 Accuracy    : 35
GMC Priority1   : 128
Global Data:
UTC Offset      : 0
Leap-61        : FALSE
Freq Traceable  : FALSE
Time source     : 16

Clock Identity :
Clock Class      : 255
Log Variance     : 15353
Clock Priority2: 128
Leap59           : FALSE
Time Traceable   : FALSE
Time Source      : 0
Steps Removed    : 0

GMC Class        : 80
GMC Variance     : 0
GMC Priority2     : 128

Leap-59          : FALSE
Time tracable    : FALSE
Time Scale       : FALSE

```

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 191](#)

Output Fields [Table 130 on page 1748](#) lists the output fields for the **show ptp hybrid** command. Output fields are listed in the approximate order in which they appear.

Table 130: show ptp hybrid Output Fields

Field Name	Field Description
ptp source	Displays the IP address of the PTP source.
sync source	Displays the interface name of the Synchronous Ethernet source through which the PTP source is traceable.
Configured Mode	Displays the current configured mode of the router as Hybrid .
Operating Mode	Displays the current operation mode: Hybrid or None .
PTP Reference	Displays the IP address and the interface name of the PTP reference clock.
Synchronous Ethernet Reference	Displays the interface name of the Synchronous Ethernet reference clock.
Lock state	Displays the current lock state of the router: Locked , Initializing , or Acquiring .
Lock state description	Displays the description for the current lock state of the router: <ul style="list-style-type: none"> • Initializing—Hybrid mode is being initialized. • Acquiring Frequency—Synchronous Ethernet source identified for frequency synchronization, acquiring frequency-related data from master clock. • Frequency Locked, Acquiring Phase—Frequency locked from the Synchronous Ethernet source, acquiring phase-related data from master clock. • Frequency and Phase Locked—Slave clock is frequency and phase synchronized with master clock.

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

Syntax	show ptp lock-status
Release Information	Command introduced in Junos OS Release 12.2.
Description	(ACX Series, MX80, MX240, MX480, and MX960 routers) Display information about the lock status of the slave. The output verifies whether the slave is aligned to the grandmaster (master clock) or not.
Options	detail —Display detailed information about the lock status of the slave.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • <i>IEEE 1588v2 PTP Boundary Clock Overview</i> • <i>IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers</i> • Precision Time Protocol Overview on page 163
List of Sample Output	show ptp lock-status on page 1751 show ptp lock-status (ACX Series) on page 1751 show ptp lock-status detail (ACX Series) on page 1751
Output Fields	Table 131 on page 1750 lists the output fields for the show ptp lock-status command. Output fields are listed in the approximate order in which they appear.

Table 131: show ptp lock-status Output Fields

Field Name	Field Description
Lock State	<p>State of the slave clock with respect to its master clock:</p> <ul style="list-style-type: none"> • Freerun • Holdover • Phase Aligned • Acquiring • Initializing • Freq locked
Phase offset	Time offset information of a slave clock with respect to its master clock. Precision of this time offset is 1 nanosecond.
State since	<p>Date, time, and how long ago the lock status of the PTP client or slave clock changed. The format is State since: year-month-day hour:minute:second:timezone (hour:minute:second ago). For example, State since: 2002-04-26 10:52:40 PDT (04:33:20 ago). On ACX Series routers, this field is displayed in Junos OS Release 15.1 and later.</p>

Table 131: show ptp lock-status Output Fields (*continued*)

Field Name	Field Description
Selected Master Details	<p>Details include the following:</p> <ul style="list-style-type: none"> • Upstream Master address—The address of the remote master from which the slave acquires the clock. • Slave interface—The slave interface on this router corresponding to the Master above.

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 master

Syntax	show ptp master <brief | detail | interface>
Release Information	Command introduced in Junos OS Release 12.2.
Description	(MX80, MX240, MX480, and MX960 routers) Display information about the configured master and the status of the master.
Options	brief —Display information about the master in brief. detail —Display information about the master in detail. interface —Display information about the configured interface of the master.
Required Privilege Level	View
Related Documentation	<ul style="list-style-type: none"> • Precision Time Protocol Overview on page 163
Output Fields	Table 132 on page 1752 lists the output fields for the show ptp master command. Output fields are listed in the approximate order in which they appear.

Table 132: show ptp master Output Fields

Field Name	Field Description
Interface	Name of the interface configured for Precision Time Protocol (PTP) on the master.
Status	Status of the Precision Time Protocol master: <ul style="list-style-type: none"> • Master or Slave • Active or Inactive • Initializing or Down
Local Address	IP or MAC address of the configured master clock.
Status (Local address Status)	Status of the local address of the interface: <ul style="list-style-type: none"> • Configured or Not configured • Master or Slave • Active or Inactive
Total Remote Slaves	Number of remote slaves.
Slave Address	IP or MAC address of the slave.

Table 132: show ptp master Output Fields (*continued*)

Field Name	Field Description
Status	Status of the address of the slave:
(Slave Address Status)	<ul style="list-style-type: none"> • Configured or Not configured • Master or Slave • Active or Inactive or Ready

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

```
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 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

Syntax	show ptp path-trace detail
Release Information	Command introduced in Junos OS Release 13.3R4.
Description	(MX80, MX240, MX480, and MX960 routers) Display the details of the path an announce message takes in a PTP ring topology.
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • <i>IEEE 1588v2 PTP Boundary Clock Overview</i> • Precision Time Protocol Overview on page 163
List of Sample Output	show ptp path-trace detail on page 1754
Output Fields	Table 133 on page 1754 lists the output fields for the show ptp path-trace detail command. Output fields are listed in the approximate order in which they appear.

Table 133: 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 port

Syntax	<code>show ptp port</code> <code><brief | detail></code>
Release Information	Command introduced in Junos OS Release 12.2.
Description	(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.
Options	brief —Display information about the PTP port in brief. detail —Display information about the PTP port in detail.
Required Privilege Level	View
Related Documentation	<ul style="list-style-type: none"> • Precision Time Protocol Overview on page 163
Output Fields	Table 134 on page 1755 lists the output fields for the show ptp port command. Output fields are listed in the approximate order in which they appear.

Table 134: show ptp port Output Fields

Field Name	Field Description
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: PTP listening or PTP initializing .
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.
Announce Timeout	Number of times the announce interval message has to pass between the slave and the master without receipt of an announce message.
Sync Interval	Logarithmic mean interval for sync interval messages to be sent by the master.
Delay Mechanism	Type of delay mechanism used.
Port Number	PTP port number.

Table 134: show ptp port Output Fields (*continued*)

Field Name	Field Description
Operating Mode	Clock mode of the node.
Master Clock ID	Unique clock-identity of the master.
Previous Announce Messages	Previous announce messages.
Current Announce Message	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

```


show ptp slave

Syntax	show ptp slave <brief | detail | interface>
Release Information	Command introduced in Junos OS Release 12.2.
Description	(MX80, MX240, MX480, and MX960 routers) Display information about the configured slave and the status of the slave.
Options	brief —Display information about the slave in detail. detail —Display information about the slave in detail. interface —Display information about the configured interface of the slave.
Required Privilege Level	View
Related Documentation	<ul style="list-style-type: none"> • Precision Time Protocol Overview on page 163
Output Fields	Table 135 on page 1757 lists the output fields for the show ptp slave command. Output fields are listed in the approximate order in which they appear.

Table 135: show ptp slave Output Fields

Field Name	Field Description
Interface	Name of the interface configured for Precision Time Protocol.
Status	Status of the Precision Time Protocol slave: <ul style="list-style-type: none"> • Master or Slave • Active or Inactive • Initializing or Down
Interface	Interface configured on the slave.
Local Address	IP or MAC address of the local interface.
Status (Local address Status)	Status of the local address of the interface acting as the slave: <ul style="list-style-type: none"> • Configured or Unconfigured • Master or Slave • Active or Inactive or Ready
Total Remote Masters	Number of remote masters.
Remote Master	IP or MAC address of the remote node.

Table 135: show ptp slave Output Fields (*continued*)

Field Name	Field Description
Status (Slave IP Address Status)	Status of the address of the master: <ul style="list-style-type: none"> • Configured or Unconfigured • Master or Slave • Active or Inactive

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 synchronous-ethernet esmc statistics

Syntax	show synchronous-ethernet esmc statistics <brief interface <i>interface-name</i> > <detail interface <i>interface-name</i> > < interface <i>interface-name</i> > < interface <i>interface-name</i> (brief | detail)>
Release Information	Command introduced in Junos OS Release 11.2R4 for MX Series 3D Universal Edge Routers. Command introduced in Junos OS Release 14.2R1 for PTX Series Packet Transport Routers.
Description	(MX5, MX10, MX40, MX80, MX80-T, MX240, MX480, MX960, MX2010, MX2020 , and PTX Series routers only) Display the Synchronous Ethernet ESMC statistics.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • Synchronous Ethernet Overview on page 149 • Configuring an External Clock Synchronization Interface for MX Series Routers on page 353 • request chassis synchronization mode on page 766 • request chassis synchronization switch on page 768 • show synchronous-ethernet global-information on page 1763 • show synchronous-ethernet esmc transmit on page 1761 • clear synchronous-ethernet esmc statistics on page 708
List of Sample Output	show synchronous-ethernet esmc statistics on page 1760 show synchronous-ethernet esmc statistics detail on page 1760 show synchronous-ethernet esmc statistics interface (PTX) on page 1760
Output Fields	Table 136 on page 1759 lists the output fields for the show synchronous-ethernet esmc statistics command. Output fields are listed in the approximate order in which they appear.

Table 136: show synchronous-ethernet esmc statistics Output Fields

Field Name	Field Description
Interface Name	interface-slot/pic/port —Displays the name of the interface for which the ESMC statistics are displayed.
Transmit Count	number —Displays the number of ESMC packets transmitted.
Receive Count	number —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
Total Drop Count: 336
Adjacency Count : 4
Receive Count    : 40534
Ineligible Drop Count: 0
```

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

Syntax	show synchronous-ethernet esmc transmit <brief interface <i>interface-name</i> > <detail interface <i>interface-name</i> > < interface <i>interface-name</i> > < interface <i>interface-name</i> (brief | detail)>
Release Information	Command introduced in Junos OS Release 11.2R4 for MX80 3D Universal Edge Routers. Command introduced in Junos OS Release 14.2R1 for PTX Series Routers.
Description	(MX5, MX10, MX40, MX80, MX80-T, MX240, MX480, MX960, MX2010, MX2020, and PTX Series routers only) Display the Synchronous Ethernet ESMC transmit interface details.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • Synchronous Ethernet Overview on page 14-9 • Configuring an External Clock Synchronization Interface for MX Series Routers on page 353 • request chassis synchronization mode on page 766 • request chassis synchronization switch on page 768 • show synchronous-ethernet global-information on page 1763 • show synchronous-ethernet esmc statistics on page 1759
List of Sample Output	show synchronous-ethernet esmc transmit on page 1762
Output Fields	Table 137 on page 1761 lists the output fields for the show synchronous-ethernet esmc transmit detail command. Output fields are listed in the approximate order in which they appear.

Table 137: show synchronous-ethernet esmc transmit detail Output Fields

Field Name	Field Description
Interface name	interface-slot/pic/port —Displays the name of the interface for which the ESMC transmit details are displayed.
Status	string —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

Syntax	show synchronous-ethernet global-information <brief>
Release Information	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.
Description	(MX5, MX10, MX40, MX80, MX80-T, MX240, MX480, MX960, and PTX routers only) Display information about the global configuration for Synchronous Ethernet chassis synchronization.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • Synchronous Ethernet Overview on page 149 • Configuring an External Clock Synchronization Interface for MX Series Routers on page 353 • request chassis synchronization mode on page 766 • show synchronous-ethernet esmc statistics on page 1759 • show synchronous-ethernet esmc transmit on page 1761
List of Sample Output	show synchronous-ethernet global-information (MX) on page 1764 show synchronous-ethernet global-information (PTX) on page 1764
Output Fields	Table 138 on page 1763 lists the output fields for the show synchronous-ethernet global-information command. Output fields are listed in the approximate order in which they appear.

Table 138: show synchronous-ethernet global-information Output Fields

Field Name	Field Description
Network option	(option-1(EEC1) | option-2(EEC2))—Displays the network option configuration, either option-1(EEC1) or option-2(EEC2).
Clock mode	(free-run | auto-select)—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.
QL mode	(enable | disable)—Displays the configured quality level mode configuration. The default is disable.
Switchover mode	(revertive | non-revertive)—Displays the configured synchronization clock switching mode. The default mode is revertive.
Config change holdover	seconds—Displays the time interval to wait before selecting the new clock source during a configuration change. The default value is 30 seconds.

Table 138: show synchronous-ethernet global-information Output Fields (*continued*)

Field Name	Field Description
Switchover holdover	seconds —Displays the time interval to wait before selecting the new clock source during switchover. The default value is 30 seconds.
Reboot holdover	seconds —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

```


PART 4

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