Junos® OS

System Basics: Chassis-Level Features Configuration Guide

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12.3

The information in this document is current as of the date on the title page.

YEAR 2000 NOTICE

Juniper Networks hardware and software products are Year 2000 compliant. Junos OS has no known time-related limitations through the year 2038. However, the NTP application is known to have some difficulty in the year 2036.

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Table of Contents

List of Figures

List of Tables

About the Documentation

Documentation and Release Notes

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

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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.xsl;
       }
     }
   }
   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.xsl; }
   ```

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 the CLI User Guide.

Documentation Conventions

Table 1 on page xxiii 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.

Table 2 on page xxiii 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`
Italic text like this	• Introduces or emphasizes important new terms. • Identifies book names. • Identifies RFC and Internet draft titles.	• A policy *term* is a named structure that defines match conditions and actions. • *Junos OS System Basics Configuration Guide* • RFC 1997, *BGP Communities Attribute*

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

Convention	Description	Examples
Italic text like this	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** *domain-name*
Text like this	Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.	• 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)	Enclose 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)	Enclose a variable for which you can substitute one or more values.	**community name members [*community-ids*]**

Indention and braces ({ })	Identify a level in the configuration hierarchy.	[edit]
		routing-options {
		static {
		route default {
		nexthop *address*;
		retain;
		}
		}
		}

; (semicolon)	Identifies a leaf statement at a configuration hierarchy level.	
J-Web GUI Conventions		
Bold text like this	Represents J-Web graphical user interface (GUI) items you click or select.	• In the Logical Interfaces box, select **All Interfaces**. • To cancel the configuration, click **Cancel**.
> (bold right angle bracket)	Separates levels in a hierarchy of J-Web 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 send your comments to techpubs-comments@juniper.net, or fill out the documentation feedback form at https://www.juniper.net/cgi-bin/docbugreport/ . If you are using e-mail, be sure to include the following information with your comments:

- Document or topic name
- URL or page number
- Software release 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 JNASC 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.

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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: https://www.juniper.net/alerts/
- 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

CHAPTER 1

Router Chassis Configuration Overview

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 to M Series, MX Series, J Series, or T Series routers, while some others are common across all routers.

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

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

```
chassis {
  aggregated-devices {
    ethernet {
      device-count number;
      lacp {
        system-priority;
        link-protection;
      }
    }
    sonet {
      device-count number;
    }
  }
  alarm {
    interface-type {
      alarm-name (red | yellow | ignore);
```

```
    }
}
config-button {
    no-clear;
    no-rescue;
}
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;
        ce1 {
            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);
  }
}
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;
    }
    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 43 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 and T1600 Router Configuration Overview" on page 48 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 265

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 Policy Configuration Guide. For more information on configuring port mirroring for Layer 2 VPLS traffic on MX Series routers, see the *Junos OS Layer 2 Configuration Guide*.

Related Documentation

- Configuring Port-Mirroring Instances on MX Series 3D Universal Edge Routers on page 89
- Configuring Port-Mirroring Instances on M320 Routers on page 81
- Configuring Port-Mirroring Instances on M120 Routers on page 82

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 430
- show chassis fabric fpcs on page 714
- show chassis fabric sibs on page 802
- show chassis sibs on page 1055

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

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 upto 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-MSC
  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 751
- show chassis fabric fpcs on page 714

T4000 Power Management Overview

Starting with Junos OS Release 12.3, the power management feature is enabled on a Juniper Networks T4000 Core Router with Six-Input DC Power Supply. This feature enables you to use only as much power as required to power the chassis. That is, this feature enables you to ensure that the router receives sufficient power to power on the Flexible PIC Concentrator (FPCs) connected to it.

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. The router might shut down if sufficient power is not available to power on all the FPCs connected to the router.

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 the input feeds, respectively.

NOTE: You can connect three 80A 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. The router might shut down if sufficient power is not available 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 available input power as a factor to decide whether or not to power on an FPC connected to the router.

Of all the supported FPC––PIC combinations in a T4000 router, the T1600 Enhanced Scaling FPC4 (model number: T1600-FPC4-ES) with 10-Gigabit LAN/WAN PIC with SFP+ (model number: PD-5-10XGE-SFPP) has the greatest power requirement. Table 3 on page 16 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.

Table 3: FPC Connection Limit Comparison

Six Input Feeds with 40 A Connection	Four Input Feeds with 60 A Connection
When no T1600-FPC4-ES with PD-5-10XGE-SFPP is connected: • All eight FPC slots can be brought online.	When no T1600-FPC4-ES with PD-5-10XGE-SFPP is connected: • Maximum of seven FPC slots with other FPC–PIC combinations can be brought online. That is, only seven slots out of the eight FPC slots can be brought online.
When only one T1600-FPC4-ES with PD-5-10XGE-SFPP is connected: • Maximum of seven FPC slots with other FPC–PIC combinations can be brought online. That is, only seven slots out of the eight FPC slots can be brought online.	When only one T1600-FPC4-ES with PD-5-10XGE-SFPP is connected: • Maximum of six FPC slots with other FPC–PIC combinations can be brought online. That is, only six slots out of the eight FPC slots can be brought online.
When only T1600-FPC4-ES with PD-5-10XGE-SFPP are connected: • Maximum of six T1600-FPC4-ES with PD-5-10XGE-SFPP can be brought online.	More than one T1600-FPC4-ES with PD-5-10XGE-SFPP cannot be brought online simultaneously.

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 to 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 205
- Configuring the Power-On Sequence for FPCs on T640, T1600, and T4000 Routers on page 103
- **pem on page 330**
- **feeds on page 295**
- **input-current on page 310**
- **fru-poweron-sequence on page 303**

CHAPTER 2

Router Chassis Clocking and Synchronization Configuration Overview

Interface and Router Clock Sources Overview

Interface and Router Clock Sources Description

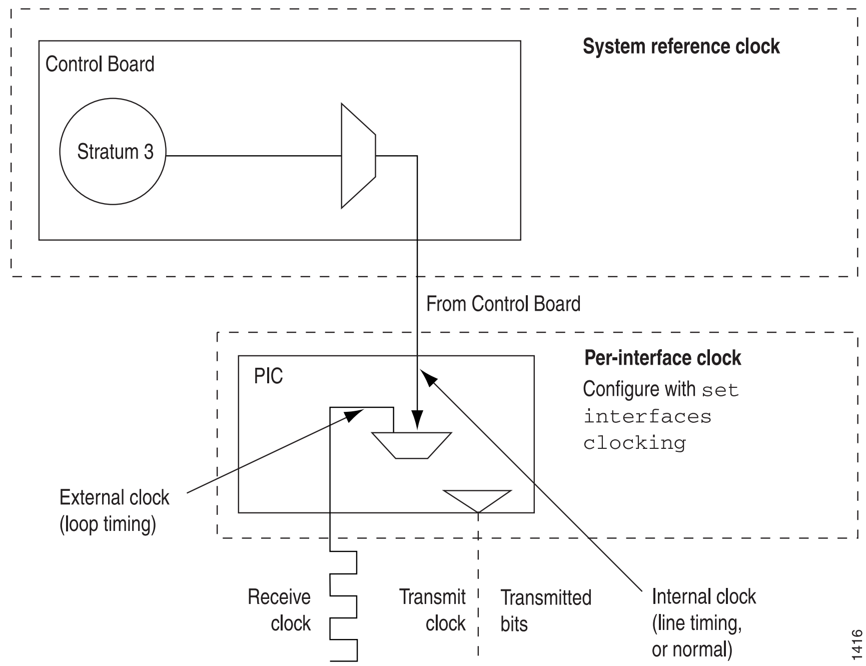
When configuring the router, you can configure the *transmit clock* on each interface; the transmit clock aligns each outgoing packet transmitted over the router's interfaces. For both the router and interfaces, the clock source can be the router's internal Stratum 3 clock, which resides on the control 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 1 on page 20 illustrates the different clock sources on the M120 router.

Figure 1: 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 143.

Related Documentation

- Configuring the Junos OS to Support an External Clock Synchronization Interface for M Series and T Series Routers on page 143
- Synchronous Ethernet Overview on page 21
- Configuring Clock Synchronization Interface for MX Series Routers on page 145

Synchronous Ethernet Overview

Synchronization is a key requirement for circuit (emulation) services and mobile radio access technologies. Traditionally, mobile networks utilized SONET/SDH technologies to backhaul voice and data traffic, and used 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 (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.

Table 4 on page 21 summarizes the first Junos OS release that supports Synchronous Ethernet on the various Juniper Networks routers and their components:

Table 4: Synchronous Ethernet Support on Junos OS

Routers and Components	Junos OS Release
10-Gigabit Ethernet MPC with SFP+ transceivers	11.2R4
MX5, MX10, MX40, and MX80 3D Universal Edge routers with model numbers MX5-T, MX10-T, MX40-T, and MX80-T	11.2R4
On MX240, MX480, and MX960 3D Universal Edge routers, only the following Enhanced MPCs (MPCEs) support Synchronous Ethernet: • 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 WAN-PHY framing mode	11.2R4
10-Gigabit Ethernet MIC with XFP in LAN-PHY framing mode	11.4
Juniper Networks PTX Series Packet Transport Switches with their 10-Gigabit Ethernet, 40-Gigabit Ethernet, and 100-Gigabit Ethernet interfaces	12.1

Table 4: Synchronous Ethernet Support on Junos OS *(continued)*

Routers and Components	Junos OS Release
Juniper Networks ACX2000 Series Universal Access routers with Gigabit Ethernet and 10-Gigabit Ethernet SFP and SFP+ transceivers.	12.2

The ingress clock monitoring feature is supported on all MX Series routers with the 16x10GE MPC. On these routers, the incoming Synchronous Ethernet signals cannot be monitored on the 16x10GE MPC but are monitored by other Modular Port Concentrators (MPCs) in the chassis. Therefore, you can use the 16x10GE 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 16x10GE 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 16x10GE 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 24.

Starting with Junos OS Release 12.1, Synchronous Ethernet is supported on Juniper Networks PTX Series Packet Transport Switches. On the packet transport switches, 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 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.

Synchronous Ethernet is not supported in the following instances:

- Slot 10 on MX Series router chassis
- RJ45 ports
- MPC3E with C form-factor pluggable (CFP) transceiver (CFP)

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, and MX960 routers.

Related Documentation

- Clock Sources for PTX Series Packet Transport Switches on page 150
- Configuring Clock Synchronization Interface for MX Series Routers on page 145

- Configuring External Clock Synchronization for ACX Series Routers
- Ethernet Synchronization Message Channel Overview on page 28
- Example: Configuring Synchronous Ethernet on MX Series Routers on page 153
- Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 157
- request chassis synchronization mode
- **show chassis synchronization (MX Series Routers) on page 1081**
- Synchronous Ethernet on 10-Gigabit Ethernet MIC Overview on page 24
- **synchronization on page 355**

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 157. 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 157.

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 157.

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 5 on page 26 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 5: 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 5 on page 26 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 Switches on page 150
- Configuring Clock Synchronization Interface for MX Series Routers on page 145
- Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 157
- request chassis synchronization mode
- **show chassis synchronization (MX Series Routers) on page 1081**
- Synchronous Ethernet Overview on page 21

- synchronization on page 355

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 for MX Series Routers” on page 145.

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 21
- Configuring Clock Synchronization Interface for MX Series Routers on page 145
- Clock Sources for PTX Series Packet Transport Switches on page 150
- **synchronization on page 355**
- request chassis synchronization mode
- **show chassis synchronization on page 1077**

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 MX Series and ACX Series routers 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 21.

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 161 and "Example: Configuring Precision Time Protocol" on page 165.

The Table 6 on page 31 summarizes the first Junos OS release that supports PTP on the various Juniper routers and their components:

Table 6: Precision Time Protocol Support

Routers and components	Junos OS Release
MX80 3D Universal Edge Routers with model number MX80-P	12.2
MX-MPC2E-3D-P on MX240, MX480, and MX960 routers	12.2
Ethernet Modular Interface Cards (MICs) on MX240, MX480, and MX960 routers	12.2
ACX Series Universal Access Routers	12.2

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, and MX960 routers.

NOTE: 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 161
- Example: Configuring Precision Time Protocol on page 165

- IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers

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 32
- Precision Time Protocol Mode on page 33
- Hybrid Mode on page 35
- Feature Mode Changes on page 35

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 7 on page 33 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 7 on page 33.

Table 7: Default Quality Level to PTP Clock-Class Mapping

SSM QL (Binary)	Standard Mappings Given in ITU-T G.781 Specification		PTP Clock Class
	Option I	**Option II**	
0001	-	QL-PRS	80
0000	-	QL-STU	82

Table 7: Default Quality Level to PTP Clock-Class Mapping *(continued)*

SSM QL (Binary)	Standard Mappings Given in ITU-T G.781 Specification		PTP Clock Class
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 169
- Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 172
- Understanding Hybrid Mode on page 36
- Precision Time Protocol Overview on page 30
- Synchronous Ethernet Overview on page 21

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 36
- Supporting Platforms on page 37

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). PTP synchronizes both frequency and phase including time of day. 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, the accuracy in the order of nanoseconds is difficult to achieve through PTP or Synchronous Ethernet and they 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.

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 clock or a slave clock.

For information about configuring hybrid mode, see "Configuring Hybrid Mode and ESMC Quality Level Mapping" on page 169. You can use the **show ptp hybrid status** operational command to find the current operating mode.

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 (also known as 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 169
- Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 172
- Precision Time Protocol Overview on page 30
- Synchronous Ethernet Overview on page 21

CHAPTER 3

Router Chassis Network Services Configuration Overview

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.

  NOTE: You can use either Enhanced IP Network Services mode or Enhanced Ethernet Network Services mode to improve the scaling and performance specific to routing 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 in the Junos OS Subscriber Management, Release 12.3.

- Junos OS Release 12.3 enables improved virtual private LAN service (VPLS) MAC address learning on T4000 routers with Type 5 FPCs by supporting up to 262,143 MAC addresses per VPLS routing instance. In Junos OS releases before Release 12.3, T4000 routers with Type 5 FPCs support only 65,535 MAC addresses per VPLS routing instance

  To improve MAC address learning on T4000 Core Routers with Type 5 FPCs, enable network services mode and then reboot the router. After the router reboots, modify the size of the MAC address table to the new limit—that is, 262,143 addresses.

NOTE:

- The MAC address learning limit for each interface remains the same (that is, 65,535 MAC addresses).
- You must reboot the router after configuring the enhanced-mode statement. When the T4000 router reboots, only the T4000 Type 5 FPCs are online while the remaining FPCs are offline.

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.
- 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 if you want to use IP Network Services mode or Enhanced IP Network Services mode. However, this configuration requires installing the licensed copies of the IP Network Services mode or Enhanced IP Network Services mode. The licenses for these services are paper licenses.
- You must configure a router chassis that has both MPC-3D-16XGE-SFPP and MPC-3D-16XGE-SFPP-R-B modules installed for Ethernet Network Services mode or Enhanced Ethernet Network Services mode.

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.

Table 8 on page 40 explains the different module functions when you configure the MX Series 3D Universal Edge router chassis for different network services modes.

Table 8: Network Services Mode Functions

Configuration Upon Boot or Configuration Change	Module Function
IP Network Services mode (default; upon boot)	All modules except DPCE-X and DPCE-X-Q modules are powered on.

Table 8: Network Services Mode Functions *(continued)*

Configuration Upon Boot or Configuration Change	Module Function
Ethernet Network Services mode (upon boot)	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. Ethernet Network Services mode provides support for only Layer 2.5 functions.
Enhanced IP Network Services mode (upon boot)	Only Trio MPCs and MS-DPCs are powered on. 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.
Enhanced Ethernet Network Services mode (upon boot)	Only Trio MPCs and MS-DPCs are powered on. All restrictions for operating in Ethernet Network Services mode apply. 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.
Change from IP Network Services mode to Ethernet Network Services mode	DPCE-X and DPCE-X-Q modules are powered on; no reboot is required. No impact to Trio MPCs or MS-DPCs.
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 Trio MPCs or MS-DPCs.
Change from Enhanced IP Network Services mode to Enhanced Ethernet Network Services mode	No reboot is required; no impact to Trio 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 9 on page 42.

Related Documentation

- Firewall Filters and Enhanced Network Services Mode Overview in the Junos OS Subscriber Management, Release 12.3.
- Table 9 on page 42
- **enhanced-mode on page 292**
- **show chassis fpc on page 849**

Restrictions on Junos OS Ethernet Network Services Mode and Enhanced Ethernet Network Services Mode Features for MX Series Routers

Table 9 on page 42 lists Junos OS feature restrictions when running in Ethernet Network Services mode or Enhanced Ethernet Network Services mode.

Table 9: Restricted Software Features in Ethernet Network Services Mode

Software Feature	Restriction in Ethernet Network Services Mode
BGP	• BGP allows only family L2 VPN to provide IP control plane support. • Data plane support applies only to Ethernet and MPLS. • BGP does not support inet, inet6, inet-vpn, and inet6-vpn
L3VPN	Layer 3 VPN is not available.
Unicast RPF	Unicast reverse-path forwarding is disabled.
Source and destination class usage (SCU and DCU)	Source and Destination Class Usage is disabled.
Filter terms	The number of externally configured filter terms is restricted to 64 KB.
Prefixes	The number of supported prefixes is restricted to 32 K.

NOTE: MX Series routers supporting Layer 2.5 functions work as full-scale routers and they support interior gateway protocol (IGP), multicast routing protocols, and other routing features. The restrictions applicable on these routers are that the number of routes is limited and you cannot use BGP.

Related Documentation

- Network Services Mode Overview on page 39
- Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 102

CHAPTER 4

TX Matrix and TX Matrix Plus Router Configuration Overview

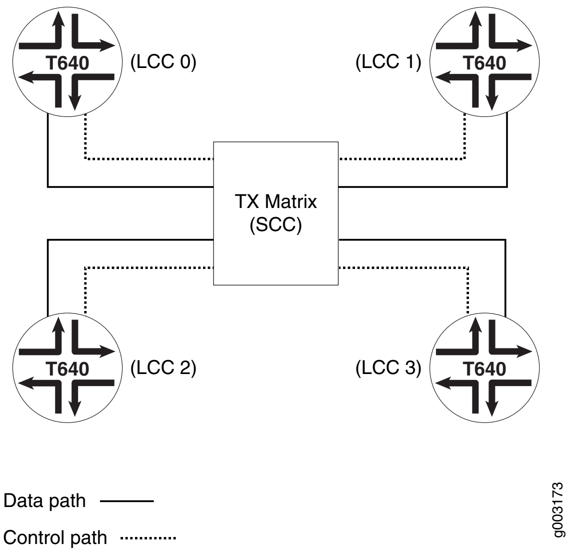
TX Matrix Router and T640 Router Configuration Overview

This topic provides an overview of configuring the TX Matrix router and T640 routers.

TX Matrix Router and T640 Router-Based Routing Matrix Overview

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 2 on page 44.

Figure 2: 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 45.

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 Configuration 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 57

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 10 on page 47. You can use the converted FPC number to configure the interfaces on the TX Matrix router in your routing matrix.

Table 10: 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 57

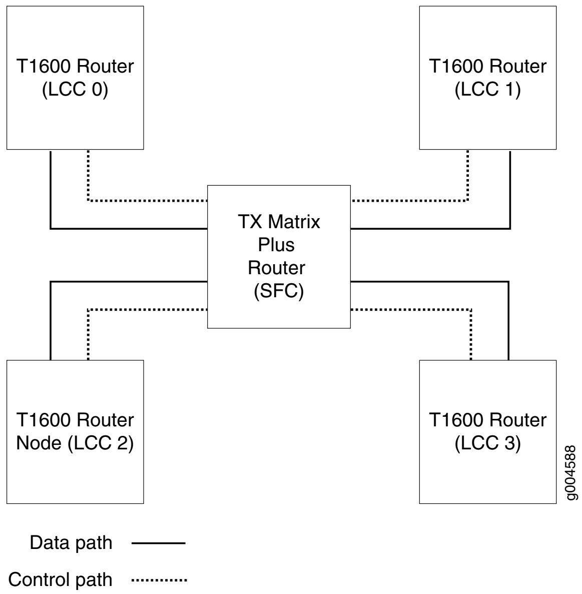
TX Matrix Plus Router and T1600 Router Configuration Overview

This topic provides an overview of configuring the TX Matrix Plus router and T1600 routers.

TX Matrix Plus Router and T1600 Router-Based Routing Matrix Overview

A routing matrix based on a TX Matrix Plus router is a multichassis architecture that consists of a TX Matrix Plus router and from one to four T1600 routers. From the perspective of the user interface, the routing matrix appears as a single router. The TX Matrix Plus router (or switch-fabric chassis (SFC)) controls all the T1600 routers (or line-card chassis (LCC)) in the routing matrix, as shown in Figure 3 on page 49.

Figure 3: Routing Matrix Composed of a TX Matrix Plus Router and Four T1600 Routers



You configure and manage the TX Matrix Plus router and its T1600 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 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 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 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 router is not propagated to the TX Matrix Plus router or other T1600 routers in the routing matrix. For details, see "Committing Configurations on the TX Matrix Plus Router" on page 51.

Running Different Junos OS Releases on the TX Matrix Plus Router and T1600 Routers

On a routing matrix composed of a TX Matrix Plus router and T1600 routers, if you elect to run different Junos OS Releases on the TX Matrix Plus router and T1600 Routing Engines, a change in Routing Engine mastership can cause one or all T1600 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 T1600 routers. Software installed on a primary TX Matrix Plus router is distributed to all connected primary T1600 routers and the backup is distributed to all connected backup routers.

TX Matrix Plus Router Rebooting Process

When you reboot the TX Matrix Plus router master Routing Engine, all the master Routing Engines in the connected T1600 routers reboot. In addition, you can selectively reboot the master Routing Engine or any of the connected T1600 routers.

TX Matrix Plus Router Routing Engine Rebooting Sequence

The Routing Engines on the TX Matrix Plus router (or switch-fabric chassis) and T1600 routers (or line-card chassis) in the routing matrix boot from the storage media in this order: the USB device (if present), the CompactFlash 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 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 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 T1600 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 host subsystem. For each host subsystem in the router, the 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 Router Internal Ethernet Interfaces

On a T1600 router configured in a routing matrix, the Routing Engine (RE-TXP-LCC) and Control Board (LCC-CB) function as a unit, or host subsystem. For each host subsystem in the router, the 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 routers configured in a routing matrix, see the Junos® OS Network Interfaces.

Committing Configurations on the TX Matrix Plus Router

In a routing matrix composed of a TX Matrix Plus router and T1600 routers, all configuration must be performed on the TX Matrix Plus router. Any configuration you commit on a T1600 router is not propagated to the TX Matrix Plus router or other T1600 routers. Only configuration changes you commit on the TX Matrix Plus router are propagated to all T1600 routers. A commit on a TX Matrix Plus router overrides any changes you commit on a T1600 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 TX Matrix Plus router.

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 router: **lcc *n*-re0** and **lcc *n*-re1**. ***n*** identifies a T1600 router from 0 through 3.

Routing Matrix System Log Messages

You configure the T1600 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 the TX Matrix Plus router or the T1600 routers, see Configuring System Logging for a TX Matrix Plus Router.

Related Documentation

- Using the Junos OS to Configure a T1600 Router Within a Routing Matrix on page 73
- TX Matrix Plus Router Chassis and Interface Names on page 52
- Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 75

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 router in a routing matrix composed of a TX Matrix Plus router and T1600 routers.

T1600 routers are assigned LCC index numbers, 0 through 3, depending on the hardware setup of the routing matrix. The current supported configuration of the routing matrix, can have up to four T1600 routers, and each T1600 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 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.

To convert FPC numbers in the T1600 routers to the correct FPC in a routing matrix, use the conversion chart shown in Table 11 on page 53. You can use the converted FPC number to configure the interfaces on the TX Matrix Plus router in your routing matrix.

Table 11: 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

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**.

Related Documentation

- TX Matrix Plus Router and T1600 Router Configuration Overview on page 48
- Using the Junos OS to Configure a T1600 Router Within a Routing Matrix on page 73
- Configuring the Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 Router Stays Offline on page 74

PART 2

Configuration

CHAPTER 5

Configuring TX Matrix Chassis-Level Features

Using the Junos OS to Configure a T640 Router Within a Routing Matrix

A routing matrix composed of a TX Matrix router and T640 routers supports the same chassis configuration statements as a standalone router (except **ce1**, **ct3**, **mlfr-uni-nni-bundles**, **sparse-dlcis**, and **vtmapping**). By including the **lcc** statement at the **[edit chassis]** hierarchy level, you configure PIC-specific features, such as framing, on specific T640 routers. In addition, a routing matrix has two more chassis configuration statements, **online-expected** and **offline**.

To configure a T640 router that is connected to a TX Matrix router, include the **lcc** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
lcc number;
```

number can be 0 through 3.

To configure a T640 router within a routing matrix, include the following statements at the **[edit chassis lcc *number*]** hierarchy level:

```
[edit chassis lcc number]
fpc slot-number { # Use the hardware FPC slot number
pic pic-number {
  atm-cell-relay-accumulation;
  atm-l2circuit-mode (cell | aal5 | trunk trunk);
  framing (sdh | sonet);
  idle-cell-format {
```

```
        itu-t;
        payload-pattern payload-pattern-byte;
      }
      max-queues-per-interface (8 | 4);
      no-concatenate;
    }
    offline;
    online-expected;
    q-pic-large-buffer {
      large-scale;
    }
```

NOTE: For the FPC slot number, specify the actual hardware slot number (numbered 0 through 7) as labeled on the T640 router chassis. Do not use the corresponding software FPC number shown in Table 10 on page 47.

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 59.

Related Documentation

- TX Matrix Router and T640 Router Configuration Overview on page 43
- TX Matrix Router Chassis and Interface Names on page 46
- Configuring the Junos OS to Upgrade and Downgrade Switch Interface Boards on a TX Matrix Router on page 58
- Configuring the Junos OS to Enable the TX Matrix Router to Generate an Alarm If a T640 Router Stays Offline on page 59

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 58
2. Configuring the Junos OS to Downgrade Switch Interface Boards on a TX Matrix Router on page 59

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 43
- Using the Junos OS to Configure a T640 Router Within a Routing Matrix on page 57

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 43
- Using the Junos OS to Configure a T640 Router Within a Routing Matrix on page 57

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, and T1600 routers.

Related Documentation

- Example: Configuring Packet Forwarding Engine FIB Localization on page 62

Configuring FIB Localization

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, and T1600 routers.

Example: Configuring Packet Forwarding Engine FIB Localization

This example shows how to configure Packet Forwarding Engine FIB localization.

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, or T1600 router.
- Junos OS Release 11.4 or later running on the router.

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
```

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@host# set policy-statement fib-policy then accept
   ```

   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 64
- Verifying FIB-Localization Configuration on page 65
- Verifying Routes After the Policy Is Applied on page 65

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

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 Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

fib-remote

Syntax fib-remote;

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-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 *policy-name* term *term-name* 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 67
- Overview on page 68
- Configuration on page 68
- Verification on page 70

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, or T1600 router.
- Junos OS Release 11.4 or later running on the router.

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
```

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@host# set policy-statement fib-policy then accept
```

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

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 60
- fib-local on page 66
- fib-remote on page 66
- no-route-localize on page 67
- route-localization on page 67

CHAPTER 6

Configuring TX Matrix Plus Chassis-Level Features

Using the Junos OS to Configure a T1600 Router Within a Routing Matrix

A routing matrix composed of a TX Matrix Plus router and T1600 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 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;
```

number can be 0 through 3.

To configure a T1600 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 router chassis. Do not use the corresponding software FPC number shown in the "TX Matrix Plus Router Chassis and Interface Names" on page 52.

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 Router Stays Offline" on page 74.

Related Documentation

- TX Matrix Plus Router and T1600 Router Configuration Overview on page 48
- TX Matrix Plus Router Chassis and Interface Names on page 52
- Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 75

Configuring the Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 Router Stays Offline

By default, the Junos OS enables all the T1600 routers in the routing matrix to come online. The Junos OS also enables you to configure all the T1600 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 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 router. When the T1600 router is ready to come back online, delete the **offline** configuration statement.

To configure a T1600 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 router that is part of the routing matrix is allowed to come online. However, if a T1600 router does not come online, the TX Matrix Plus router does not generate an alarm.

Related Documentation

- TX Matrix Plus Router and T1600 Router Configuration Overview on page 48
- Using the Junos OS to Configure a T1600 Router Within a Routing Matrix on page 73
- Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 75

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 routing platform. The TX Matrix Plus routing platform 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 76
- Configuring the Junos OS for Upgrading SIBs on the T1600 Router and Connecting It to the SFC on page 76
- Upgrading CBs and Routing Engines of the T1600 Router for Control Plane Connectivity on page 78
- Changing the Management Ethernet Interface Name for the T1600 Router on page 78
- Transferring Control of the T1600 Router (LCC0) to the SFC on page 78
- Adding a New T1600 Router to the TX Matrix Plus Routing Platform on page 79
- Downgrading a T1600 Router from the LCC of a TX Matrix Routing Platform to a Standalone T1600 Router on page 79

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 78.
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 76.
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 76.
   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.

CHAPTER 7

Configuring M Series Chassis-Level Features

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 7

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 85.

Related Documentation

- Port-Mirroring Instances Overview on page 7

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 83
2. Assigning an IP Address to an Interface in the Routing Instance on page 83

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
                Temp    CPU Utilization (%) Memory Utilization (%)
Slot    State   (C)     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 265

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 *Junos System Basics and Services Command Reference*.

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 143
- Configuring Port-Mirroring Instances on M120 Routers on page 82

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 118
- Configuring the Junos OS to Enable Larger Delay Buffers for T1, E1, and DS0 Interfaces Configured on Channelized IQ PICs on page 119

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 81
- Configuring the Junos OS to Support an External Clock Synchronization Interface for M Series and T Series Routers on page 143
- Configuring the Junos OS to Support Eight Queues on IQ Interfaces for T Series and M320 Routers on page 87

CHAPTER 8

Configuring MX Series Chassis-Level Features

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 90
- Configuring Port-Mirroring Instances at the PIC Level on page 90

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 and the Junos OS VPNs Configuration Guide.

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.
- Any change in the hash-key configuration requires rebooting the FPC for the changes to take effect.
- 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 251
- **family on page 294**
- **hash-key on page 305**
- **inet on page 308**
- **multiservice on page 319**
- **payload on page 328**
- **symmetric-hash on page 352**

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 up to 120 Gbps of full-duplex traffic.
- 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 3D Universal Edge Routers Line Card Guide*.
- 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 3D Universal Edge Routers Line Card Guide*.

Related Documentation

- 16x10GE MPC
- *MX Series 3D Universal Edge Routers Line Card Guide*.
- Configuring the Number of Active Ports on a 16-Port 10-Gigabit Ethernet MPC on MX Series Routers on page 93
- Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 102
- Configuring Tunnel Interfaces on MX Series Routers

Configuring the Number of Active Ports on a 16-Port 10-Gigabit Ethernet MPC on MX Series Routers

The Junos OS provides the **number-of-ports *active-ports*** configuration statement at the **[edit chassis fpc *slot-number*]** hierarchy level. This statement can be used for enabling or disabling the physical ports on the Packet Forwarding Engines of a 16-port 10-Gigabit Ethernet MPC (16x10GE 3D MPC). This configuration can be used for the following purposes:

- **Enabling 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.
- **Ensuring 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.

To configure the number of active ports on the 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);
```

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 3D Universal Edge Routers Line Card Guide*.

Related Documentation

- 16-Port 10-Gigabit Ethernet MPC on MX Series Routers (16x10GE 3D MPC) Overview on page 92
- Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 102
- Configuring Tunnel Interfaces on MX Series Routers
- **number-of-ports** **on page 322**

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 92
- Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 102

MPC3E on MX Series Routers Overview

In Junos OS Release 12.2 and later, MX960, MX480, and MX240 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 MPC is inserted into a MIC slot in an MX series router. MICs provide the physical interface and are installed into the MPCs.

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 10-Gigabit Ethernet MIC with SFPP (model number MIC3-3D-10XGE-SFPP)
- 2-port 40-Gigabit Ethernet MIC with QSFP+ (model number MIC3-3D-2X40GE-QSFPP)

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 MIC (MIC3-3D-1X100GE-CFP) to Interoperate with 100-Gigabit Ethernet PICs (Type 4 1X100GE PIC for STFPC4 FPC) Using SA Multicast Mode" on page 99.

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

The MPC3E supports these key features:

- Supports 100-Gigabit Ethernet interfaces
- Supports two separate slots for MICs
- Supported MICs: MIC3-3D-1X100GE-CFP, MIC3-3D-1X100GE-CXP, MIC3-3D-10XGE-SFPP, MIC3-3D-2X40GE-QSFP, MIC-3D-20GE-SFP, and the MIC-3D-2XGE-XFP
- Supports up to 100 Gbps per MIC slot
- Supports 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.
- Supports up to four full-duplex tunnel interfaces on the line card
- Supports intelligent oversubscription services

For more information about supported Junos OS features on the MPC3E, see Protocols and Applications Supported by the MX240, MX480, MX960 MPC3E in the *MX Series 3D Universal Edge Routers Line Card Guide*.

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
- Class-of-service (CoS) support
- Tunnel support
- Interoperability with existing DPCs and MPCs

At a high level, the MPC3E does not currently support these features:

- Fine-grained queuing and input queuing
- Unified in-service software upgrade (ISSU)
- Multilink services
- Internet Group Management Protocol (IGMP) snooping with bridging, integrated routing and bridging (IRB), or VPLS
- Intelligent hierarchical policers
- Precision time protocol (IEEE 1588)
- Synchronous Ethernet
- Virtual chassis support

For information about the supported and unsupported Junos OS features for this MPC, see Protocols and Applications Supported by the MX240, MX480, MX960 MPC3E in the *MX Series 3D Universal Edge Routers Line Card Guide*.

Related Documentation

- MPC3E MIC Overview
- Protocols and Applications Supported by the MX240, MX480, MX960 MPC3E
- Configuring Tunnel Interfaces on MX Series Routers with the MPC3E on page 97
- Configuring 100-Gigabit Ethernet MIC (MIC3-3D-1X100GE-CFP) to Interoperate with 100-Gigabit Ethernet PICs (Type 4 1X100GE PIC for STFPC4 FPC) Using SA Multicast Mode on page 99
- 2-port 10-Gigabit Ethernet MICs with XFP
- *MX Series 3D Universal Edge Routers Line Card Guide*.

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 *Junos Interfaces Command Reference*.

Related Documentation

- Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC on page 253
- Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 254
- Example: Configuring Tunnel Interfaces on the MPC3E on page 254
- **bandwidth (Tunnel Services) on page 276**
- **tunnel-services (Chassis) on page 369**

- [edit chassis] Hierarchy Level

Configuring 100-Gigabit Ethernet MIC (MIC3-3D-1X100GE-CFP) to Interoperate with 100-Gigabit Ethernet PICs (Type 4 1X100GE PIC for STFPC4 FPC) Using SA Multicast Mode

To configure a 100-Gigabit Ethernet MIC (MIC3-3D-1X100GE-CFP) to interoperate with other Juniper Networks 100-Gigabit Ethernet PICs (Type 4 1X100GE PIC for STFPC4 FPC), 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 and each 1X100GE MIC creates a single PIC. A 100-Gigabit Ethernet MIC plugged in to slot 0 corresponds to PIC 0 and the MIC plugged in to 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

The default packet steering mode for the 100-Gigabit Ethernet PIC 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 Gpbs Packet Forwarding Engines to achieve 100 Gbps throughput. The 50 Gpbs 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 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 Gpbs 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-*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 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 the 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 Junos OS Operational Mode Commands.

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 303

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 Services Interfaces Configuration Release 11.2

Related Documentation

- Configuring the Junos OS to Enable Service Packages on Adaptive Services Interfaces on page 141

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 346

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 39
- Firewall Filters and Enhanced Network Services Mode Overview in the Junos OS Subscriber Management, Release 12.3
- Restrictions on Junos OS Ethernet Network Services Mode and Enhanced Ethernet Network Services Mode Features for MX Series Routers on page 42
- 16-Port 10-Gigabit Ethernet MPC on MX Series Routers (16x10GE 3D MPC) Overview on page 92
- network-services on page 320

CHAPTER 9

Configuring T Series Chassis-Level Features

Configuring the Power-On Sequence for FPCs on T640, T1600, and T4000 Routers

Starting with Junos OS Release 12.3, the Junos OS enables you to configure the power-on sequence for the Flexible PIC Concentrators (FPCs) on T640, T1600, and T4000 routers with the Six-Input DC Power Supply. This enables you to redistribute the available power to the FPCs based on 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 205
- **fru-poweron-sequence on page 303**

CHAPTER 10

Configuring J Series Chassis-Level Features

Configuring the Junos OS to Prevent the Resetting of the Factory Default or Rescue Configuration During Current Configuration Failure on J Series Routers

On J Series Services Routers, if the current configuration fails, you can load a rescue configuration or the factory default configuration by pressing the **CONFIG** (Reset) button:

- Rescue configuration—When you press and quickly release the **CONFIG** button, the configuration LED blinks green and the rescue configuration is loaded and committed. The rescue configuration is user defined and must be set previously for this operation to be successful.
- Factory defaults—When you hold the **CONFIG** button for more than 15 seconds, the configuration LED blinks red and the router is set back to the factory default configuration.

CAUTION: **When you set the router back to the factory default configuration, the current committed configuration and all previous revisions of the router's configuration are deleted.**

To limit how the **CONFIG** button resets a router configuration, include one or both of the following statements at the **[edit chassis]** hierarchy level:

```
[edit chassis]
config-button {
  no-clear;
```

```
    no-rescue;
  }
```

no-clear—Prevents resetting the router to the factory default configuration. You can still press and quickly release the button to reset to the rescue configuration (if one was set previously).

no-rescue—Prevents resetting the router to the rescue configuration. You can still press and hold the button for more than 15 seconds to reset to the factory default configuration.

When both the **no-clear** and **no-rescue** statements are present, the **CONFIG** button does not reset to either configuration.

Configuring the Junos OS to Support the uPIM Mode on J Series Routers

The 6-port, 8-port, and 16-port Gigabit Ethernet uPIMs used on the J Series routers (J2320, J2350, J4350, and J6350) support Layer 2 switching and can forward traffic at both Layer 2 (switching) and Layer 3 (routing). You can configure a uPIM to run in either routing mode (the default) or switching mode.

Routing mode provides the standard routing services. Switching mode allows traffic forwarding at both Layer 2 and Layer 3. At Layer 2, a uPIM can switch intra-LAN traffic from one LAN host to another, such as from one port on a uPIM to another on the same uPIM. At Layer 3, a uPIM can route traffic to WAN interfaces and other PIMs present on the chassis.

To configure the PIM mode, include the following statements at the **[edit chassis fpc]** hierarchy level:

```
[edit chassis]
fpc fpc-slot {
  pic pim-slot {
    ethernet {
      pic-mode (switching | routing);
    }
  }
}
```

Related Documentation

- Configuring the Junos OS to Set a PIM Offline on J Series Routers on page 106
- Configuring the Junos OS to Disable Power Management on the J Series Chassis on page 107

Configuring the Junos OS to Set a PIM Offline on J Series Routers

On J Series routers, the system monitors the PIMs and verifies that a newly inserted PIM falls within the power capacity of the chassis. PIMs that fall outside of acceptable power ranges can be taken offline or disabled for power management purposes.

This operation differs from the **power-off** option used on non-J Series products.

To take a PIM offline, include the **offline** statement at the **[edit chassis fpc *slot-number*]** hierarchy level:


```
[edit chassis fpc slot-number]
offline;
```

Related Documentation

- Configuring the Junos OS to Support the uPIM Mode on J Series Routers on page 106
- Configuring the Junos OS to Disable Power Management on the J Series Chassis on page 107

Configuring the Junos OS to Disable Power Management on the J Series Chassis

Instead of setting a PIM offline, the power management feature on a chassis can be disabled. The **disable-power-management** statement disables power management on the chassis and, when used, causes any PIMs disabled because of exceeding chassis power limits to come online.

It is important to consider power management carefully before enabling disabled PIMs. If the PIMs have been disabled because they exceeded power limits, they should not be enabled.

To disable power management on the J Series chassis, include the **disable-power-management** statement at the **[edit chassis]** hierarchy level:

```
[edit chassis]
disable-power-management;
```

Related Documentation

- Configuring the Junos OS to Set a PIM Offline on J Series Routers on page 106
- Configuring the Junos OS to Support the uPIM Mode on J Series Routers on page 106

Configuring J Series Services Router Switching Interfaces

In access switching mode, only one physical interface is configured for the entire Gigabit Ethernet uPIM. The single physical interface serves as a virtual router interface (VRI). Configuration of the physical port characteristics is done under the single physical interface.

To configure Gigabit Ethernet uPIM physical Ethernet interface properties, include the **switch-port** statement at the **[edit interfaces ge-*pim*/0/0 switch-options]** hierarchy level:

```
[edit interfaces ge-pim /0/0 switch-options]
switch-port port-number {
  (auto-negotiation | no-auto-negotiation);
  speed (10m | 100m | 1g);
  link-mode (full-duplex | half-duplex);
}
```

Related Documentation

- Example: Configuring J Series Services Router Switching Interfaces on page 254

CHAPTER 11

Configuring PIC-Specific Features

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 84
- Router Chassis Configuration Statements on page 265

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.

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 *Junos OS SONET/SDH Interfaces Configuration Guide*.

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 43
- TX Matrix Plus Router and T1600 Router Configuration Overview on page 48
- Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized (Multiplexed) Mode on page 114

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 *Junos OS SONET/SDH Interfaces Configuration Guide*.

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 123

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 in to 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 179
- Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC on page 118
- Configuring the Junos OS to Enable Idle Cell Format and Payload Patterns for ATM Devices on page 180
- atm-cell-relay-accumulation on page 274

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 114
- Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 135
- Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 116
- Configuring the Junos OS to Support Channelized STM1 Interface Virtual Tributary Mapping on page 137
- Configuring the Junos OS to Enable Larger Delay Buffers for T1, E1, and DS0 Interfaces Configured on Channelized IQ PICs on page 119

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 110
- Configuring the Junos OS to Support the Sparse DLCI Mode on Channelized STM1 or Channelized DS3 PICs on page 114

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 *N*xDS0 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 (*N*xDS-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 12 on page 117 for more information about ranges.)

You can use any of the values within the range available for ***x***; you do not have to configure the links sequentially. The software applies the interface options you configure according to the following rules:

- You can configure the **e1-options** statement for channel group 0 only; for example, **ds-0/0/0:0**.
- There are no restrictions on changing the default **ds0-options**.
- If you delete a configuration you previously committed for channel group 0, the options return to the default values.

To configure the channel groups and time slots for a Channelized E1 interface, include the **channel-group** and **timeslots** statements at the **[edit chassis fpc *slot-number* pic *pic-number* ce1 e1 *port-number*]** hierarchy level:

[edit chassis fpc *slot-number* pic *pic-number* ce1 e1 *port-number*]
channel-group *channel-number* timeslots *slot-number*;

NOTE: If you commit the interface name but do not include the [edit chassis] configuration, the Channelized E1 PIC behaves like a standard E1 PIC: none of the DS0 functionality is accessible.

NOTE: The FPC slot range depends on the platform. The maximum range of 0 through 7 applies to M40 routers; for M20 routers, the range is 0 through 3; for M10 routers the range is 0 through 1; for M5 routers, the only applicable value is 0. The Channelized E1 PIC is not supported on M160 routers.

The theoretical maximum number of channel groups possible per PIC is 10 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 117

Ranges for Channelized E1 Interfaces Configuration

Table 12 on page 117 shows the ranges for configuring channel groups and time slots for Channelized E1 Interfaces.

Table 12: Ranges for Channelized E1 Configuration

Item	Variable	Range
FPC slot	*slot-number*	0 through 7 (see note below)
PIC slot	*pic-number*	0 through 3
E1 port	*port-number*	0 through 9
DS0 channel group	*group-number*	0 through 23
Time slot	*slot-number*	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 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 116

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;
}
```

For an example on how to enable ILMI for cell relay, see the *Junos OS ATM Interfaces Configuration Guide*.

Related Documentation

- Configuring the Junos OS to Enable ATM2 Intelligent Queuing Layer 2 Circuit Transport Mode on page 179

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 119

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 118

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 *N*xDS0 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 13 on page 120.)

For information on configuring the buffer size, see the *Junos Class of Service Configuration Guide*.

Related Documentation

- Maximum Delay Buffer with q-pic-large-buffer Statement Enabled on page 120

Maximum Delay Buffer with q-pic-large-buffer Statement Enabled

Table 13 on page 120 lists the maximum delay buffer that can be configured for T1, E1, and DS0 interfaces configured on Channelized IQ PICs:

Table 13: 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
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

Table 13: Maximum Delay Buffer with q-pic-large-buffer Statement Enabled *(continued)*

Platform, PIC, or Interface Type	Maximum Buffer Size
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
*N*xDS0 IQ Interfaces—Maximum sizes vary by channel size:	
1xDSO through 3xDS0	4,000,000 microseconds
4xDSO through 7xDS0	2,000,000 microseconds
8xDSO through 15xDS0	1,000,000 microseconds
16xDSO through 32xDS0	500,000 microseconds
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 119

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 291
- ingress-policer-overhead on page 309

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.

   Also, for ATM MICs, you can configure the **oc12-stm4** port speed option only for ports 0 and 4. 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. However, rate-selectability can be disabled only on the 8-port SONET/SDH OC3/STM1 (Multi-Rate) MIC.

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**

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 351
- no-multi-rate on page 321

CHAPTER 12

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 M320, T320, T640, T1600, 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 302

CHAPTER 13

Configuring Chassis Settings to Support Aggregated Devices

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

To define virtual links, you need to specify the associations between physical and logical devices within the **[edit interfaces]** hierarchy, and assign the correct number of logical devices by including the **device-count** statement at the **[edit chassis aggregated-devices ethernet]** and **[edit chassis aggregated-devices sonet]** hierarchy levels:

```
[edit chassis]
aggregated-devices {
  ethernet {
    device-count number;
  }
  sonet {
    device-count number;
  }
}
```

The maximum number of Ethernet logical interfaces that you can configure is 128. On M Series and T Series routers, you can configure a maximum number of 128 aggregated interfaces. On MX Series routers, you can configure a maximum of 480 aggregated interfaces. The aggregated interfaces are numbered from **ae0** through **ae127** for M Series and T Series routers, and the aggregated interfaces (LAG bundles) are numbered from **ae0** through **ae479** on MX Series routers. The maximum number of SONET/SDH logical interfaces is 16. The aggregated SONET/SDH interfaces are numbered from **as0** through **as15**.

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;
```

Related Documentation

- Configuring an Aggregated Ethernet Interface
- Junos® OS Ethernet Interfaces
- Configuring Aggregated Ethernet Interfaces on PTX Series Packet Transport Switches

CHAPTER 14

Configuring Chassis Settings to Support Load Balancing

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, and M320, M120, MX Series, and T Series routers. 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 316

CHAPTER 15

Configuring Chassis Settings to Support Channelized Interfaces

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 14 on page 136 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 x 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-number*1 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 136

Ranges for Channelized DS3-to-DS0 Configuration

Table 14 on page 136 shows the ranges for each of the quantities in the preceding configuration.

Table 14: Ranges for Channelized DS3-to-DS0 Configuration

Item	Variable	Range
FPC slot	***slot-number***	0 through 7 (see note below)

Table 14: Ranges for Channelized DS3-to-DS0 Configuration *(continued)*

Item	Variable	Range
PIC slot	*pic-number*	0 through 3
Port	*port-number*	0 through 1
T1 link	*link-number*	0 through 27
DS0 channel group	*group-number*	0 through 7
time slot	*slot-number*	1 through 24

Related Documentation

- Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 135

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 114
- 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 278

CHAPTER 16

Configuring Chassis Settings to Support Adaptive Services Interfaces

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 101

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

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

- Configuring an External Clock Synchronization Interface for PTX Series Packet Transport Switches on page 151

Configuring Clock Synchronization Interface for MX Series Routers

MX5-T, MX10-T, MX40-T, MX80, MX80-T, MX240, MX480, and MX960 routers support external clock synchronization using Synchronous Ethernet.

Configuring external clock synchronization requires making clock selection, quality level (QL), and priority considerations. The clock selection algorithm is used to pick the two best clock sources, primary and secondary, from among all the various sources, based on system configuration and execution criteria such as QL, priority, hardware restrictions, and so on, and is achieved using the following logic and restrictions:

- QL must be configured for non-external clocks, whether or not QL is enabled.
- In the case of option-1, QL must be configured for external clocks (external-a or external-b), whether or not QL is enabled.
- In the case of option-2, the default QL for the external clocks is QL_STU, whether or not QL is enabled.
- Starting with Junos OS Release 12.2R1, the quality level (QL) parameter for a Synchronous Ethernet interface is optional when **quality-mode** is enabled and the **selection-mode** is set to **receive-quality**. The default QL for a Synchronous Ethernet interface is **SEC** for the **option-1** network type and **ST3** for the **option-2** network type.
- When QL is enabled, the received QL must be equal to or better than the configured QL for that particular source or else that source will not be considered for clock selection. This is so that a downstream client is guaranteed clock quality of a certain level (that 'certain level' being the configured QL).
- Configuring priority is optional. When not specified, external-a has a higher default priority than external-b, and external-b has a higher default priority than Ethernet based sources such as ge or xe clock sources, which have the lowest default priority. Configured priority is higher than any default priority.
- The 10-Gigabit Ethernet MIC with XFP supports Synchronous Ethernet, which requires both the MIC and interface configured in LAN framing mode. In LAN mode, the LAN frequency is directly supplied by the MIC's on-board clocking circuitry.
- During clock selection:
  - The active source with highest QL is selected.
  - If QL is the same for two or more sources, then the source with highest priority wins.
  - If two or more sources have the same QL and priority, then currently active source, if any, among these sources wins.
  - If two or more sources have the same QL and priority, and none of these is currently active, then any one of these may be picked.
  - The configured (or default) QL of the selected clock source is used for Ethernet Synchronization Messaging Channel (ESMC).

- If the primary clock source is ge|xe-x/y/z, where y is even (0 or 2), then the secondary cannot be ge|xe-x/y/* or ge|xe-x/y + 1/*. E.g., if ge-1/2/3 is the primary clock source, then the secondary cannot be ge-1/2/* or ge-1/3/* for an MX80 or MX240 router.
- If the primary clock source is ge|xe-x/y/z, where y is odd (1 or 3), then the secondary cannot be ge|xe-x/y/* or ge|xe-x/y - 1/*. E.g., if xe-2/3/4 is the primary, then the secondary cannot be xe-2/2/* or xe-2/3/* for an MX80 or MX240 router.
- If the primary clock source is ge|xe-x/y/z, then the secondary cannot be ge|xe-x/y/* in the case of 12-16x10G DPC on an MX Series router e.g., if ge-0/1/2, is primary, then ge-0/1/* cannot be the secondary clock source, but ge-0/0/* may be the secondary.
- In order to receive or transmit ESMC messages out of an interface, at least one logical interface should be configured on that interface. If the interface is currently not configured with a logical interface, you may do so using the **set interfaces** ***interface-name*** **unit 0** statement at the **edit** hierarchy level.

Setting the clock type

To set the clock type, use the following command:

```
set chassis synchronization network-option (option-1 | option-2)
```

EEC-1 maps to G.813 option 1 and EEC-2 maps to G.812 type IV clock.

Setting the clock mode

To set the mode of operation to select the clock source either from free-run local oscillator or from an external qualified clock, use the following command:

```
set chassis synchronization clock-mode (free-run | auto-select)
```

For MX80 routers, the free-run clock is provided by the local oscillator..

For MX240 routers, the free-run clock is provided by the SCB..

The default for both routers is auto-select mode.

Setting the quality mode

To set the synchronization quality mode, use the following command:

```
set chassis synchronization quality-mode-enable
```

The default is disable.

Setting the selection mode

To configure the ESMC or SSM quality-based clock selection mode, use the following command:

```
set chassis synchronization selection-mode (configured-quality|received-quality)
```

When the **selection-mode** statement is set as **configured-quality**, the clock source selection algorithm uses the ESMC or SSM quality level configured for a qualifying interface.

When the **selection-mode** statement is set as **received-quality**, the clock source selection algorithm uses the ESMC or SSM quality level received on the qualifying 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.

Setting the switchover, config-change, or reboot times

To set the switchover, configuration-change, or restart time, use the following command:

```
set chassis synchronization hold-interval (configuration-change | restart |
switchover) seconds
```

This sets the time interval to wait before selecting the new clock source during.

The default switchover time is 30 seconds and cold boot time is 120 seconds.

Setting the synchronization switching mode

To set the synchronization switchover mode, use the following command:

```
set chassis synchronization switchover-mode (revertive | non-revertive)
```

In revertive mode, the system switches from a lower to a higher quality clock source whenever the higher clock source becomes available.

In non-revertive mode, the system continues to use the current clock source as long as it is valid.

The default mode is revertive.

Setting the clock source

To set the clock source, use the following command:

```
set chassis synchronization source (external-a | external-b | interfaces
interface-name)
```

The clock source is specified using the clock selection process.

Setting ESMC packet transmit

To enable ESMC packet transmit, use the following command:

```
set chassis synchronization esmc-transmit interfaces interface-name
```

Setting the synchronization source quality level

To set the synchronization source quality level, use the following command:

```
set chassis synchronization source (external-a | external-b | interfaces
interface-name) quality-level (prc | prs |sec | smc | ssu-a | ssu-b | st2 | st3 |
st3e | st4 | stu | tnc)
```

Both option I and option II SSM quality levels are supported.

The quality level is set to DNU for network-option 1 and set to DUS for network-option 2, if quality-level not configured and no ESMC messages received.

On selected active source (primary or secondary which 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 Ethernet interface type sources. This is done to avoid the source looping, as per the standard requirement.

Setting the synchronization source priority

To set the synchronization source priority, use the following command:

```
set chassis synchronization source (external-a | external-b | interfaces
interface-name) priority number
```

Setting the

To set the synchronization source wait to restore time, use the following command:

synchronization source wait to restore time

```
set chassis synchronization source interfaces interface-name wait-to-restore
minutes
```

A wait-to-restore time can be configured for each port. 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 selection process.

The range is from **0** through **12** minutes.

The default time is 5 minutes.

Setting the synchronization source lockout

To set the synchronization source lockout, use the following command:

```
set chassis synchronization source (external-a | external-b | interfaces
interface-name) request lockout
```

Lockout may be configured for any source. When configured, that source will not be considered by the selection process.

Setting the forced switch

To set the forced switch, use the following command:

```
set chassis synchronization source (external-a | external-b | interfaces
interface-name) request force-switch
```

Forces a switch to the source provided the source is enabled and not locked out. Only one configured source may be force-switched.

Setting the MIC level framing mode for the 10-Gigabit Ethernet MIC with XFP

To configure the LAN framing mode on the 10-Gigabit Ethernet MIC with XFP, use the following command:

```
set chassis fpc fpc-slot pic pic-slot framing <lan>
```

Operation in LAN framing mode on the 10-Gigabit Ethernet MIC with XFP also requires interface framing mode configuration of the MIC interface.

Setting the interface framing mode for the 10-Gigabit Ethernet MIC with XFP

To configure the interface framing mode on the 10-Gigabit Ethernet MIC with XFP, use the following command:

```
set interfaces xe-fpc/pic/port framing-mode <lan-phy | wan-phy>
```

Operation in LAN framing mode on the 10-Gigabit Ethernet MIC with XFP also requires MIC level framing mode configuration.

To verify the configuration, see “Example: Configuring Synchronous Ethernet on MX Series Routers” on page 153.

Related Documentation

- Clock Sources for PTX Series Packet Transport Switches on page 150
- Example: Configuring Synchronous Ethernet on MX Series Routers on page 153
- Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 157
- request chassis synchronization mode
- **show chassis synchronization (MX Series Routers) on page 1081**

- **synchronization (MX Series) on page 355**
- Synchronous Ethernet Overview on page 21

Clock Sources for PTX Series Packet Transport Switches

System clocking on PTX Series Packet Transport Switches 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.

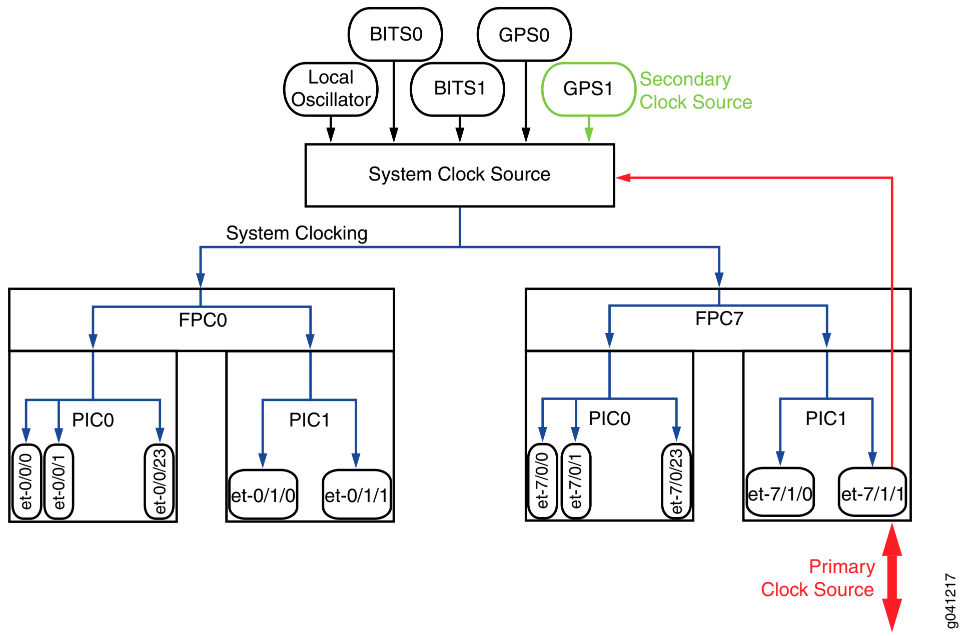
PTX Series Packet Transport Switches can use an internal clock source or it can extract clocking from an external source.

Clock sources and specifications include:

- The PTX Series Packet Transport Switch 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 G.8261 and G.8262 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 4: Clocking Example for PTX Series Packet Transport Switches



In this example, the primary clock source is configured as interface **et-7/1/1** and the secondary clock source is configured as **gps1**.

Related Documentation

- Configuring an External Clock Synchronization Interface for PTX Series Packet Transport Switches on page 151
- recovered-clock
- **synchronization on page 353**

Configuring an External Clock Synchronization Interface for PTX Series Packet Transport Switches

The PTX Series Packet Transport Switches 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. 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.

The PTX Series Packet Transport Switches include a Centralized Clock Generator (CCG) that is used to generate systemwide interface timing signals. The CCG:

- Provides a synchronous Ethernet clock source to the chassis.

- Accepts a BITS clock from CCG bulkhead to use as the basis for the Stratum clock source.
- Accepts an RX recovered clock from an FPC to use as input for the Stratum clock source.

The sources can be BITS, GPS, freerunning, or RX recovered line timing.

To configure a recovered clock for an FPC, include the **recovered-clock** statement at the **[edit chassis fpc *slot-number* pic *pic-number*]** hierarchy level:

```
[edit chassis fpc slot-number pic pic-number]
recovered-clock {
  port port-number;
}
```

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);
  transmitter-enable;
  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);
}
```

Use the **synchronization** statement options to specify a primary and secondary timing source. To do this, configure the following options:

- For the PTX Series Packet Transport Switches, specify a signal type mode for interfaces, either **t1** or **e1**.
- Specify the switching mode as **revertive** if a lower-priority synchronization can be switched to a valid, higher-priority synchronization.
- Specify the primary external timing source by using the **primary (fpc-*slot-number* | gps-0-10mhz | gps-0-5mhz | gps-1-10mhz | gps-1-5mhz |bits-a | bits-b)** statement.
- Specify the secondary external timing source by using the **secondary (fpc-*slot-number* | gps-0-10mhz | gps-0-5mhz | gps-1-10mhz | gps-1-5mhz |bits-a | bits-b)** statement.

For the PTX 5000 Packet Transport Switch, the supported clock sources are:

- **fpc-0**, **fpc-1**, **fpc-2**, **fpc-3**, **fpc-4**, **fpc-5**, **fpc-6**, or **fpc-7**.
- **gps-0-10mhz**, **gps-0-5mhz**, **gps-1-10mhz**, or **gps-1-5mhz**.
- **bits-a** or **bits-b**

Related Documentation

- Clock Sources for PTX Series Packet Transport Switches on page 150
- recovered-clock

• synchronization on page 353

Example: Configuring Synchronous Ethernet on MX Series Routers

- Requirements on page 153
- Overview on page 153
- Configuration on page 153
- Verification on page 155

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

- [xref target has no title]

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 for MX Series Routers" on page 145.

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

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 Switches on page 150
- Configuring Clock Synchronization Interface for MX Series Routers on page 145
- Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 157
- request chassis synchronization mode
- **show chassis synchronization (MX Series Routers) on page 1081**
- **synchronization (MX Series) on page 355**
- Synchronous Ethernet Overview on page 21

Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC

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 24.

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 for MX Series Routers" on page 145.

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 Switches on page 150
- Configuring Clock Synchronization Interface for MX Series Routers on page 145
- request chassis synchronization mode
- **show chassis synchronization (MX Series Routers) on page 1081**
- Synchronous Ethernet Overview on page 21
- Synchronous Ethernet on 10-Gigabit Ethernet MIC Overview on page 24
- **synchronization (MX Series) on page 355**

CHAPTER 18

Configuring Chassis Setting to Support Precision Time Protocol

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

This topic includes the following tasks:

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.

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***

Related Documentation

- [edit protocols ptp] Hierarchy Level
- Precision Time Protocol Overview on page 30
- Example: Configuring Precision Time Protocol on page 165

Example: Configuring Precision Time Protocol

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 161.

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-client10.10.1.1 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

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 in the Junos OS Operational Mode Commands.

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 in the Junos OS Operational Mode Commands.

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 in the Junos OS Operational Mode Commands.

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 in the Junos OS Operational Mode Commands.

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 in the Junos OS Operational Mode Commands.

Related Documentation

- [edit protocols ptp] Hierarchy Level
- Configuring Precision Time Protocol on page 161
- Precision Time Protocol Overview on page 30

CHAPTER 19

Configuring Chassis Setting to Support Hybrid Mode

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 32. The following procedures explain configuring hybrid mode with either of the modes in detail.

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***

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 172.

Related Documentation

- Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 172
- Understanding Hybrid Mode on page 36
- Precision Time Protocol Overview on page 30
- Synchronous Ethernet Overview on page 21

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

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 32. 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 169.

Configuration

Hybrid Mode with Mapping of the PTP Clock Class to the ESMC Quality Level

CLI Quick Configuration

To quickly configure hybrid mode on the ge-1/2/3.0 interface with the clock source IP address as 2.2.2.2, copy the following commands, paste them in a text file, remove any line breaks, and then copy and paste the commands into the CLI.

```
[edit]

set protocols ptp slave hybrid
set protocols ptp slave hybrid synchronous-ethernet-mapping
set protocols ptp slave hybrid synchronous-ethernet-mapping clock-source 2.2.2.2 interface
ge-1/2/3.0
set protocols ptp slave convert-clock-class-to-quality-level
```

Step-by-Step Procedure

To configure hybrid mode on an MX240 router with mapping of the PTP clock class to the ESMC quality level, perform the following steps:

1. Configure the **convert-clock-class-to-quality-level** option on the slave at the **[edit protocols ptp slave]** hierarchy level.

   ```
   [edit protocols ptp slave]
   user@host# set convert-clock-class-to-quality-level
   ```

2. Configure hybrid mode on the slave.

   ```
   [edit protocols ptp slave]
   user@host# edit hybrid
   ```

3. Configure the Synchronous Ethernet mapping option, IP address of the master clock as 2.2.2.2, and the interface ge-1/2/3.0 for hybrid mode on the slave.

   ```
   [edit protocols ptp slave hybrid]
   user@host# set synchronous-ethernet-mapping clock-source 2.2.2.2 interface
     ge-1/2/3.0
   ```

Results

Display the results of the configuration of hybrid mode with the mapping of the PTP clock class to the ESMC quality level:

```
[edit protocols ptp slave]
user@host# show
convert-clock-class-to-quality-level
hybrid {
  synchronous-ethernet-mapping {
    clock-source 2.2.2.2 {
    interface ge-1/2/3.0;
    }
  }
}
```

Hybrid Mode with a User-Defined Mapping of the PTP Clock Class to the ESMC Quality Level

CLI Quick Configuration

To quickly configure hybrid mode on the interface ge-1/2/3.0, copy the following commands, paste them in a text file, remove any line breaks, and then copy and paste the commands into the CLI.

```
[edit]

set protocols ptp slave hybrid
set protocols ptp slave hybrid synchronous-ethernet-mapping
set protocols ptp slave hybrid synchronous-ethernet-mapping clock-source 2.2.2.2 interface
ge-1/2/3.0
set protocols ptp slave clock-class-to-quality-level-mapping quality-level prc clock-class
80
```

Step-by-Step Procedure

To configure hybrid mode with a user-defined mapping of the PTP clock class to the ESMC quality level on an MX240 router, perform the following steps:

1. Configure the **quality-level** option for the **clock-class-to-quality-level-mapping** statement on the slave at the **[edit protocols ptp slave]** hierarchy level and then configure the **clock-class** option for the set quality level if you want to manually override the mapping of the ESMC quality level to the clock class.

   ```
   [edit protocols ptp slave]
   user@host# set clock-class-to-quality-level-mapping quality-level prc clock-class
     80
   ```

2. Configure hybrid mode on the slave.

   ```
   [edit protocols ptp slave]
   user@host# edit hybrid
   ```

3. Configure the Synchronous Ethernet mapping option, IP address of the master clock as 2.2.2.2 , and the interface ge-1/2/3.0 for hybrid mode on the slave.

   ```
   [edit protocols ptp slave hybrid]
   user@host# set synchronous-ethernet-mapping clock-source 2.2.2.2 interface
     ge-1/2/3.0
   ```

Results

Display the results of the configuration of hybrid mode with a user-defined mapping of the PTP clock class to the ESMC quality level:

```
[edit protocols ptp slave]
user@host# show
clock-class-to-quality-level-mapping {
  quality-level prc {
    clock-class 80;
  }
}
hybrid {
  synchronous-ethernet-mapping {
    clock-source 2.2.2.2 {
    interface ge-1/2/3.0;
```



```
        }
      }
    }
```

Verification

Verifying That the Router Is Operating in Hybrid Mode

Purpose Verify the current mode of operation of the slave.

Action In operational mode, enter the **run show ptp hybrid** command to display the current configuration and current mode of operation of the slave.

In operational mode, enter the **run show ptp hybrid config** command to display the PTP source to Synchronous Ethernet interface mappings.

In operational mode, enter the **run show ptp hybrid status** command to display the current hybrid mode operational status.

Meaning The output displays the current configuration and current mode of operation of the slave. For information about the **run show ptp hybrid** operational command, see show ptp hybrid.

Verifying the Quality Level Change on the Transmit Side

Purpose Verify the quality level change on the transmit side of the router.

Action In operational mode, enter the **run show synchronous-ethernet esmc transmit detail** command to display the ESMC transmit interface details.

Meaning The output displays the ESMC SSM quality level transmitted out of various Ethernet interfaces. For information about the **run show synchronous-ethernet esmc transmit detail** operational command, see show synchronous-ethernet esmc transmit.

Verifying Global Information Parameters After Mapping of the PTP Clock Class to the ESMC Quality Level in Hybrid Mode

Purpose Verify the global information parameters after mapping of the PTP clock class to the ESMC quality level in hybrid mode by enabling the **convert-clock-class-to-quality-level** option.

Action In operational mode, enter the **run show ptp global-information** command to display the following output:

```
user@host> run show ptp global-information
PTP Global Configuration:
Domain number            : 0
Transport Encapsulation : IPv4
Clock mode               : Ordinary
Priority Level1          : 128
Priority Level2          : 128
Unicast Negotiation      : Disabled
ESMC QL From Clock Class: Enabled
Clock Class/ESMC QL      : 84 / (QL SSU-A/SSM 0x4)
Slave Parameters:
  Sync Interval          : -
  Delay Request Interval: -6 (64 packets per second)
  Announce Interval      : -
  Announce Timeout       : 3
Master Parameters:
  Sync Interval          : -6 (64 packets per second)
  Delay Request Interval: -
  Announce Interval      : 1 (1 packet every 2 seconds)
  Clock Step             : one-step
Number of Slaves        : 1
Number of Masters       : 0
```

In operational mode, enter the **run show ptp quality-level-mapping** command to display the following output:

```
user@host> run show ptp quality-level-mapping
quality level          ptp clock class
PRC                       84
SSU-A                     92
SSU-B                     96
SEC                       104
```

Meaning The output for **run show ptp global-information** displays the parameters set in Synchronous Ethernet mode and the parameters set for the master and the slave.

The output of **run show ptp quality-level-mapping** displays the default mapping of the clock class to the ESMC quality level.

Verifying Global Information Parameters After Configuring User-Defined Mapping of the PTP Clock Class to the ESMC Quality Level in Hybrid Mode

Purpose Verify the global information parameters after configuring a user-defined mapping of the PTP clock class to the ESMC quality level in hybrid mode by disabling the **convert-clock-class-to-quality-level** option.

Action In operational mode, enter the **run show ptp global-information** command to display the following output:

```
user@host> run show ptp global-information
PTP Global Configuration:
Domain number            : 0
Transport Encapsulation : IPv4
Clock mode               : Ordinary
Priority Level1          : 128
```

```
Priority Level2          : 128
Unicast Negotiation      : Disabled
ESMC QL From Clock Class: Disabled
Clock Class/ESMC QL      :  -
Slave Parameters:
  Sync Interval          : -
  Delay Request Interval: -6 (64 packets per second)
  Announce Interval      : -
  Announce Timeout       : 3
Master Parameters:
  Sync Interval          : -6 (64 packets per second)
  Delay Request Interval: -
  Announce Interval      : 1 (1 packet every 2 seconds)
  Clock Step             : one-step
```

Meaning The output displays the parameters set in Synchronous Ethernet mode and the parameters set for the master and the slave.

Related Documentation

- Configuring Hybrid Mode and ESMC Quality Level Mapping on page 169
- Understanding Hybrid Mode on page 36
- Precision Time Protocol Overview on page 30
- Synchronous Ethernet Overview on page 21

CHAPTER 20

Configuring Chassis Settings to Support ATM Devices

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 118
- Configuring the Junos OS to Enable Idle Cell Format and Payload Patterns for ATM Devices on page 180
- Configuring the Junos OS to Use ATM Cell-Relay Accumulation Mode on an ATM1 PIC on page 113

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 43. For information about the TX Matrix Plus router, see “TX Matrix Plus Router and T1600 Router Configuration Overview” on page 48.

Related Documentation

- Configuring the Junos OS to Use ATM Cell-Relay Accumulation Mode on an ATM1 PIC on page 113
- Configuring the Junos OS to Enable ATM2 Intelligent Queuing Layer 2 Circuit Transport Mode on page 179
- Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC on page 118

- 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

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

- System Basics: Chassis-Level Features Configuration Guide

Traffic Black Hole Caused by Fabric Degradation

A traffic black hole occurs when packets are dropped by a device without notification. Other connected devices continue to forward traffic to the affected device, impacting the network performance. A severely degraded fabric plane can be one of the reasons for a traffic black hole.

Devices can limit the black-hole time by detecting unreachable destination Packet Forwarding Engines and signaling connected devices when they cannot carry traffic because of a severely degraded fabric.

Packet Forwarding Engine destinations can become unreachable for the following reasons:

- The fabric Switch Interface Boards (SIBs) go 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 detected by the SPMB.
- On T640 and T1600 routers:
  - 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.

- On PTX Series systems:
  - Link errors on all connected planes
  - Two Packet Forwarding Engines can reach the fabric but not each other
  - Link errors where two Packet Forwarding Engines have connectivity with the fabric but not through a common plane

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. On T640 and T1600 routers: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.

   On PTX Series systems: SIB restart phase: Healing is attempted 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 bad.

2. On T640 and T1600 routers: Fabric plane and FPC restart phase: Healing is attempted by restarting both the fabric planes and the FPCs. If there are bad FPCs that are unable to initiate high-speed links to the fabric after reboot, creation of traffic black hole is limited because no interfaces are created for these FPCs.

   On PTX Series systems: SIB and FPC restart phase: Healing is attempted by restarting both the SIBs and the FPCs. If there are bad FPCs that are unable to initiate high-speed links to the fabric after reboot, creation of traffic black hole is limited because no interfaces are created for these FPCs.

3. FPC offline phase: Traffic black hole is limited by turning the FPCs offline and by turning off interfaces because previous attempts at recovery have failed.

By default, the system limits black-hole time by detecting severely degraded fabric. No user interaction is necessary.

Related Documentation

- Disabling FPC Restart on page 194
- Router Chassis Configuration Statements on page 265

- degraded

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 ocur 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 192
- Corrective Actions for Fabric Failures on MX Series Routers on page 189
- **redundancy-mode on page 340**
- **show chassis fabric redundancy-mode on page 794**
- Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 195

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 189
- FPCs with Degraded Fabric on page 191
- Complete Black Hole Towards a Single Destination Only on page 191
- Redundancy Fabric Mode on Active Control Boards on page 191

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 the 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 192.

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 with Trio chips 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 that contain the enhanced SCB with Trio chips 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 195.

Related Documentation

- Detection and Corrective Actions of FPCs with Degraded Fabric on MX Series Routers on page 192
- Detection and Recovery of Fabric-Related Failures Caused by Traffic Black Holes on MX Series Routers on page 186
- **redundancy-mode on page 340**
- **show chassis fabric redundancy-mode on page 794**

- Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 195

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 186
- Corrective Actions for Fabric Failures on MX Series Routers on page 189
- **redundancy-mode on page 340**
- **show chassis fabric redundancy-mode on page 794**

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 systems, 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 systems) 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 185
- Router Chassis Configuration Statements on page 265

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 {
  offine-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 323**
- Traffic Black Hole Caused by Fabric Degradation on page 185
- Router Chassis Configuration Statements on page 265

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, the maximum number of available fabric planes are used for MX routers with Trio chips 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 that contain the enhanced SCB with Trio chips and the MPC3E, 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 340**
- **show chassis fabric redundancy-mode on page 794**
- Router Chassis Configuration Statements on page 265

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, and 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**—(T Series platforms only) 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 Configuration Guide.

  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.

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 318
- filter on page 297
- route (chassis) on page 341
- vpn-label on page 373

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 Configuration Guide.

You can configure the Routing Engine to halt (instead of rebooting) when the hard disk fails on the Routing Engine. To configure this feature, include the **disk-failure-action (halt | reboot)** statement at the **[edit chassis routing-engine on-disk-failure]** hierarchy level:

```
[edit chassis routing-engine]
on-disk-failure {
  disk-failure-action (halt | reboot);
}
```

Use the **halt** option to configure the Routing Engine to halt when the hard disk fails. Use the **reboot** option to configure the Routing Engine to reboot when the hard disk fails.

Related Documentation

- Configuring Automatic Mirroring of the CompactFlash Card on the Hard Disk Drive

Associating Sampling Instances for Active Flow Monitoring with a Specific Packet Forwarding Engine

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 Packet Forwarding Engine.

To configure active sampling instances, include the **instance** statement at the **[edit forwarding-options sampling]** hierarchy level. This configuration is supported on MX Series, M120, M320, and T Series routers. For more information about configuring sampling instances, see the Junos Services Interfaces Configuration Release 11.2.

To associate a configured active sampling instance with a specific Packet Forwarding Engine, 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 or 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*
- sampling-instance on page 344

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 291
- ingress-policer-overhead on page 309

Configuring Sanity Polling for FPCs on T Series Routers

T Series routers running Junos OS Release 11.4 and later support the sanity polling feature. You can configure the **sanity-poll** statement for a particular FPC to start a periodic sanity check for that FPC. The periodic sanity check includes checking for FPC 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 and performs the appropriate actions in case of an error.

To configure sanity polling for an FPC, 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;
    }
  }
}
```


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 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 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, 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 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. If you do not configure any actions, the **sanity-poll** statement generates only FPC system log messages.

Related Documentation

- sanity-poll on page 345
- retry-count on page 341

- on-error on page 325

CHAPTER 22

Configuring Chassis Settings for the Craft Interface

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 209
- Silencing External Devices Connected to Alarm Relay Contacts on page 250

CHAPTER 23

Configuring Chassis Settings for PEMs

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, 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 60A 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 tasks lists the procedure for configuring 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 206
- Configuring the Six-Input DC Power Supply on T640 and T1600 Routers on page 206
- Configuring the Six-Input DC Power Supply on T4000 Routers on page 207

Configuring the Six-Input DC Power Supply on an LCC Router in a Routing Matrix

To configure the six-input DC power supply:

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:

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:

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 60A of input current:

   [edit chassis pem]
   user@host# **set input-current 60**

   NOTE: You can connect three 80A DC power cables to Six-Input DC Power Supply using terminal jumpers. When you do this, ensure that you configure the **feeds** statement as 6 and the **input current** statement as 40. If these configurations are not set, the power management feature is *not* enabled. For more information on the power management feature, see "T4000 Power Management Overview" on page 15.

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 15
- Configuring the Power-On Sequence for FPCs on T640, T1600, and T4000 Routers on page 103

- pem on page 330
- feeds on page 295
- input-current on page 310
- fru-poweron-sequence on page 303

- Chassis Traps

CHAPTER 24

Configuring Chassis Settings for Alarms

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 210
- Chassis Conditions That Trigger Alarms on page 211
- Silencing External Devices Connected to Alarm Relay Contacts on page 250

System-Wide Alarms and Alarms for Each Interface Type

Table 15 on page 210 lists the system-wide alarms and the alarms for each interface type.

Table 15: 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 15: 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 209

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 248
- For J Series Services Routers chassis component alarm conditions, see the *J Series Services Routers Hardware Guide*
- Chassis Component Alarm Conditions on M5 and M10 Routers on page 212
- Chassis Component Alarm Conditions on M7i and M10i Routers on page 215
- Chassis Component Alarm Conditions on M20 Routers on page 220

- Chassis Component Alarm Conditions on M40 Routers on page 223
- Chassis Component Alarm Conditions on M40e and M160 Routers on page 228
- Chassis Component Alarm Conditions on M120 Routers on page 233
- Chassis Component Alarm Conditions on M320 Routers on page 238
- Chassis Component Alarm Conditions on MX Series 3D Universal Edge Routers on page 243

- For PTX5000 Packet Transport Switch chassis component alarm conditions, see the *PTX5000 Packet Transport Switch 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,sSee 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 16 on page 212 lists the alarms that the chassis components can generate on M5 and M10 routers.

Table 16: 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 16: 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 16: 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.	• 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 16: 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.	• 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.	• 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.	• 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.	• 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 **www.juniper.net/** 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 M7i and M10i Routers

Table 17 on page 216 lists the alarms that the chassis components can generate on M7i and M10i routers.

Table 17: 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 17: 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 17: 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. An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded. This might be caused by a faulty serial console port cable connected to the device.	Replace the serial cable connected to the device. 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.	Yellow
	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 17: Chassis Component Alarm Conditions on M7i and M10i Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		• 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.	• 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.	• 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.	• 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.	• 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 18 on page 220 lists the alarms that the chassis components can generate on M20 routers.

Table 18: 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 18: Chassis Component Alarm Conditions on M20 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Excessive framing errors on console port. An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded. This might be caused by a faulty serial console port cable connected to the device.	Replace the serial cable connected to the device. 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.	Yellow
	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 18: Chassis Component Alarm Conditions on M20 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		• 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 18: 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.	• 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.	• 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.	• 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.	• 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 19 on page 223 lists the alarms that the chassis components can generate on M40 routers.

Table 19: Chassis Component Alarm Conditions on M40 Routers

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Air filter	Change air filter.	Change air filter.	Yellow

Table 19: 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 19: 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 19: Chassis Component Alarm Conditions on M40 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Excessive framing errors on console port. An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded. This might be caused by a faulty serial console port cable connected to the device.	Replace the serial cable connected to the device. 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.	Yellow
	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 19: Chassis Component Alarm Conditions on M40 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		• 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 19: 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.	• 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.	• 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.	• 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.	• 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 20 on page 229 lists the alarms that the chassis components can generate on M40e and M160 routers.

Table 20: 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 20: 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 20: 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. An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded. This might be caused by a faulty serial console port cable connected to the device.	Replace the serial cable connected to the device. 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.	Yellow
	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 20: Chassis Component Alarm Conditions on M40e and M160 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		• 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 20: 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.	• 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.	• 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.	• 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.	• 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 21 on page 233 lists the alarms that the chassis components can generate on M120 routers.

Table 21: Chassis Component Alarm Conditions on M120 Routers

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Air filters	Change air filter.	Change air filter.	Yellow

Table 21: 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 21: 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 21: Chassis Component Alarm Conditions on M120 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Excessive framing errors on console port. An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded. This might be caused by a faulty serial console port cable connected to the device.	Replace the serial cable connected to the device. 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.	Yellow
	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 21: Chassis Component Alarm Conditions on M120 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		• 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 21: 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.	• 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.	• 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.	• 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.	• 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 22 on page 239 lists the alarms that the chassis components can generate on M320 routers.

Table 22: 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 22: 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 22: Chassis Component Alarm Conditions on M320 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Routing Engine	Excessive framing errors on console port. An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded. This might be caused by a faulty serial console port cable connected to the device.	Replace the serial cable connected to the device. 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.	Yellow
	Error in reading or writing hard disk.	Reformat hard disk and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	Error in reading or writing CompactFlash card.	Reformat CompactFlash card and install bootable image. If this fails, replace failed Routing Engine.	Yellow
	System booted from default backup Routing Engine. If you manually switched mastership, ignore this alarm condition.	Install bootable image on default master Routing Engine. If this fails, replace failed Routing Engine.	Yellow
	System booted from hard disk.	Install bootable image on CompactFlash card. If this fails, replace failed Routing Engine.	Yellow
	CompactFlash card missing in boot list.	Replace failed Routing Engine.	Red
	Hard disk missing in boot list.	Replace failed Routing Engine.	Red
	Routing Engine failed to boot.	Replace failed Routing Engine.	Red
	A spare SIB is missing.	Insert spare SIB in to empty slot.	Yellow
	The Ethernet management interface (**fxp0** or **em0**) on the Routing Engine is down.		Red

Table 22: Chassis Component Alarm Conditions on M320 Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		• 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.	• Check room temperature. • Check air filter and replace it. • Check airflow. • Check fan.	Yellow

Table 22: 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.	• 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.	• 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.	• 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 23 on page 243 lists the alarms that the chassis components can generate on MX Series 3D Universal Edge routers.

Table 23: 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 23: 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 23: 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 23: 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. An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded. This might be caused by a faulty serial console port cable connected to the device.	Replace the serial cable connected to the device. 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.	Yellow
	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 23: Chassis Component Alarm Conditions on MX Series 3D Universal Edge Routers *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
		• 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 23: 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.	• 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.	• 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.	• 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.	• 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 24 on page 249 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 High Availability Configuration Guide*.

Table 24: 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.	• 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 24: Backup Routing Engine Alarms *(continued)*

Chassis Component	Alarm Condition	Remedy	Alarm Severity
Multibit Memory ECC	The backup Routing Engine reports a multibit ECC error.	• 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 250

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 209
- Configuring the Junos OS to Disable the Physical Operation of the Craft Interface on page 203

CHAPTER 25

Examples

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 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 90

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 118
- Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 254
- Example: Configuring Tunnel Interfaces on the MPC3E on page 254
- **bandwidth (Tunnel Services) on page 276**
- **tunnel-services (Chassis) on page 369**

- [edit chassis] Hierarchy Level

Example: Configuring J Series Services Router Switching Interfaces

Configure a single physical interface for the uPIM and set the port parameters for port 0 and port 1:

```
[edit interfaces]
ge-2/0/0 {
  {
    switch-port 0 {
      no-auto-negotiation;
      1g;
      link-mode full-duplex;
    }
    port 1 {
      no-auto-negotiation;
      10m;
      link-mode half-duplex;
    }
  }
}
```

Related Documentation

- Configuring J Series Services Router Switching Interfaces on page 107

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 253
- Example: Configuring Tunnel Interfaces on the MPC3E on page 254
- **bandwidth (Tunnel Services) on page 276**
- **tunnel-services (Chassis) on page 369**

- [edit chassis] Hierarchy Level

Example: Configuring Tunnel Interfaces on the MPC3E

- Configuring a 20-Gigabit Ethernet Tunnel on page 255
- Configuring a Tunnel With Unspecified Bandwidth on page 255

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 trafiic 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 253
- Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 254
- **bandwidth (Tunnel Services) on page 276**
- **tunnel-services (Chassis) on page 369**

- [edit chassis] Hierarchy Level
- Configuring Tunnel Interfaces on MX Series Routers

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 (SCB): Synchronous Ethernet, ordinary Precision Time Protocol (PTP) slave, hybrid PTP slave, and retiming through the building-integrated timing supply (BITS) external interface.

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, and MX960 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

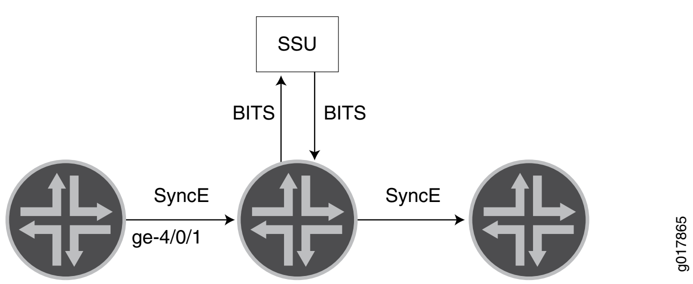
With the addition of a Stratum 3 (ST3) clock module to the Enhanced MX SCB, an MX240, MX480, or MX960 chassis can perform clock monitoring, filtering, and holdover in a centralized chassis location. Chassis line cards can be configured to recover network timing clocks at the physical layer via Synchronous Ethernet or by a packet-based PTP implementation. These recovered clocks are routed to the Enhanced MX 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, and MX960 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 Enhanced MX SCB OCXO device.

In Junos 12.3, support was added for synchronizing an MX240, MX480, or MX960 chassis with an Enhanced MX SCB to a BITS timing source through an RJ-48 port on the Enhanced MX SCB. The BITS external clock interface (ECI) 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 5 on page 257 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 260.

Figure 5: BITS Retiming with Synchronization Supply Unit (SSU)



Prior to the Enhanced MX SCB, 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

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 165.

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 262
- Verifying the Ordinary PTP Clock Source on page 262
- Verifying the Hybrid PTP Clock Source on page 263
- Verifying the Retiming through the BITS External Interface on page 263

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 355**
- **show chassis synchronization (MX Series Routers) on page 1081**
- Example: Configuring Precision Time Protocol on page 165
- Configuring Hybrid Mode and ESMC Quality Level Mapping on page 169
- PTP Operational Mode Commands
- Precision Time Protocol Overview on page 30

CHAPTER 26

Configuration Statements

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 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);
    }
  }
  config-button {
    no-clear;
    no-rescue;
    craft-lockout;
  }
  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);
   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;
      ce1 {
         e1 port-number {
            channel-group channel-number timeslots slot-number;
         }
      }
      channelization;
      ct3 {
         port port-number {
            t1 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;
    input-current amps-in-each-feed;
}
maximum-ecmp;
offline;
online-expected;
sampling-instance;
}
memory-enhanced{
    filter;
    route;
    vpn-label;
}
(packet-scheduling | no-packet-scheduling);
pem {
    minimum number;
    feeds number-of-input-feeds
}
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 43 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 and T1600 Router Configuration Overview” on page 48 and the *TX Matrix Plus Router Hardware Guide*.

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 12.1X48R4 for PTX Series Packet Transport Switches.

Description
Allow the user to disable restarting of the FPCs during healing from a degraded fabric condition. The device can automatically recover from degraded fabric conditions by restarting both the fabric planes and the FPCs. If the **action-fpc-restart-disable** statement is configured, the healing attempt is limited to restarting the fabric planes only.

Default
The system will detect a blackholing condition and try to heal the system.

Required Privilege Level
interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Disabling FPC Restart on page 194
- Traffic Black Hole Caused by Fabric Degradation on page 185

adaptive-services

Syntax
```
adaptive-services {
  (layer-2 | layer-3);
}
```

Hierarchy Level
[edit chassis fpc *slot-number* pic *pic-number*]

Release Information
Statement introduced before Junos OS Release 7.4.

Description
Enable a service package on adaptive services interfaces.

Options
The remaining statements are explained separately.

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 Service Packages on Adaptive Services Interfaces on page 141
- Configuring the Junos OS to Support Layer 2 Services on MX Series 3D Universal Edge Routers with MS-DPCs on page 101

- *Junos Services Interfaces Configuration Guide*
- Junos OS Feature Guides

aggregate-ports

Syntax aggregate-ports;

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*]

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

- Configuring 4-Port OC192 PIC to Operate in OC768-over-OC192 Mode

aggregated-devices

Syntax

```
aggregated-devices {
  ethernet {
    device-count number;
    lacp {
      link-protection {
        non-revertive;
      }
      system-priority;
    }
  }
  sonet {
    device-count number;
    }
  maximum-links maximum-links-limit;
}
```

Hierarchy Level [edit chassis]

Release Information Statement introduced before Junos OS Release 7.4.
Support for LACP link protection and system priority introduced in Junos OS Release 9.3.

Description Configure properties for aggregated devices on the router.

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

- Configuring Junos OS for Supporting Aggregated Devices on page 127

alarm (chassis)

Syntax

```
alarm {
  interface-type {
    alarm-name (ignore |red | yellow);
  }
}
```

Hierarchy Level

[edit chassis],
[edit chassis interconnect-device *name*],
[edit chassis node-group *name*]

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.

Description

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.

To configure more than one alarm, include multiple ***alarm-name*** lines.

Options

alarm-name—Alarm condition. For a list of conditions, see Table 15 on page 210.

ignore—The specified alarm condition does not set off any alarm.

interface-type—Type of interface on which you are configuring the alarm: **atm**, **ethernet**, **sonet**, or **t3**.

red—The specified alarm condition sets off a red alarm.

yellow—The specified alarm condition sets off a yellow alarm.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Understanding Alarms
- Chassis Conditions That Trigger Alarms on page 211
- Chassis Alarm Messages on a QFX3500 Device
- Interface Alarm Messages

allow-sram-parity-errors

Syntax allow-sram-parity-errors;

Hierarchy Level [edit chassis fpc *slot-number*]

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 *announce-timeout-value*;

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 *announce-timeout-value*—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

- Configuring Precision Time Protocol on page 161
- Example: Configuring Precision Time Protocol on page 165
- Precision Time Protocol Overview on page 30

announce-interval

Syntax announce-interval *announce-interval-value*;

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 *announce-interval-value*—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

- Configuring Precision Time Protocol on page 161
- Example: Configuring Precision Time Protocol on page 165
- Precision Time Protocol Overview on page 30

atm-cell-relay-accumulation

Syntax atm-cell-relay-accumulation;

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 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

- Configuring the Junos OS to Use ATM Cell-Relay Accumulation Mode on an ATM1 PIC on page 113

atm-l2circuit-mode

Syntax atm-l2circuit-mode (cell | aal5 | trunk *trunk*);

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 Configure the ATM2 intelligent queuing (IQ) Layer 2 circuit transport mode.

Default aal5

Options **aal5**—Tunnel a stream of ATM cells encoded with ATM Adaptation Layer (AAL5) over an IP Multiprotocol Label Switching (MPLS) backbone.

cell—Tunnel a stream of ATM cells over an IP MPLS backbone.

trunk ***trunk***—Transport ATM cells over an MPLS core network that is implemented on some other vendor switches. Trunk mode can be **UNI** or **NNI**.

NOTE: To determine which vendors support Layer 2 circuit trunk mode, contact Juniper Networks Customer Support.

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 ATM2 Intelligent Queuing Layer 2 Circuit Transport Mode on page 179

bandwidth (Tunnel Services)

Syntax bandwidth *bandwidth-value*;

Hierarchy Level [edit chassis fpc *slot-number* pic *number* tunnel-services]

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 *bandwidth-value*—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**.

NOTE: If you specify a bandwidth that is not compatible with the type of DPCs or MPCs and their respective Packet Forwarding Engine, tunnel services are not activated. For example, you cannot specify 1 gigabit per second bandwidth for a Packet Forwarding Engine on a 10-Gigabit Ethernet 4-port DPC or 16x10GE 3D MPC.

NOTE: Bandwidth rates of 20 gigabits per second and 40 gigabits per second require use of an MX Series router with the MPC3E and the 100-Gigabit CFP MIC.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC on page 253
- 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 254
- Example: Configuring Tunnel Interfaces on the MPC3E on page 254
- Configuring Layer 3 Tunnel Services Interfaces on an MX Series Router with a DPC
- tunnel-services (Chassis) on page 369
- [edit chassis] Hierarchy Level

ce1

Syntax

```
ce1 {
  e1 port-number {
    channel-group channel-number timeslots slot-number;
  }
}
```

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*]

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure channelized E1 port and channel specifications.

Options **e1** ***port-number***—Any valid E1 port number on the host system.

The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 116

channel-group

Syntax channel-group *channel-number* timeslots *slot-number*;

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number* ce1 e1 *link-number*],
[edit chassis fpc *slot-number* pic *pic-number* ct3 port *port-number* t1 *link-number*],
[edit chassis lcc *lcc-index* fpc *slot-number* pic *pic-number* ce1 e1 *link-number*],
[edit chassis lcc *lcc-index* fpc *slot-number* pic *pic-number* ct3 port *port-number* t1 *link-number*]

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure the DS0 channel number.

Options ***channel-number***—DS0 channel group.

Range: 0 through 7 for DS0 naming, and 0 through 23 for E1 naming.

timeslots *slot-number*—One or more actual time slot numbers allocated.

Range: 1 through 24 for T1 and 1 through 32 for E1

Default: All time slots for T1 and all time slots for E1

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 135
- Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 116

channelization

Syntax channelization;

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*]

Release Information Statement introduced in Junos OS Release 11.4.

Description Enable the DS3/E3 MIC 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 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

- Configuring the Junos OS to Enable Channelization on DS3/E3 MIC on page 137

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	• Router Chassis Configuration Statements on page 265

clock-class

Syntax	clock-class *clock-class-value*;
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.
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 169 • Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 172 • Understanding Hybrid Mode on page 36 • Precision Time Protocol Overview on page 30 • Synchronous Ethernet Overview on page 21

clock-class-to-quality-level-mapping

Syntax

```
clock-class-to-quality-level-mapping {
  clock-class clock-class-value;
  {
    quality-level ql-value;
  }
}
```

Hierarchy Level [edit protocols ptp slave]

Release Information Statement introduced in Junos OS Release 12.2R2.

Description Configure the slave to override the default Precision Time Protocol (PTP) clock class to Ethernet Synchronization Message Channel (ESMC) mapping.

The remaining statements are explained separately.

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 169
- Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 172
- Understanding Hybrid Mode on page 36
- Precision Time Protocol Overview on page 30
- Synchronous Ethernet Overview on page 21

clock-source (slave)

Syntax

clock-source *ip-address* {
  local-ip-address *local-ip-address*;
}

Hierarchy Level

[edit protocols ptp slave interface *interface-name* unicast-mode transport]

Release Information

Statement introduced in Junos OS Release 12.2.

Description

Configure the IP address of the master.

Options

ip-address—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

- Configuring Precision Time Protocol on page 161
- Example: Configuring Precision Time Protocol on page 165
- Precision Time Protocol Overview on page 30

clock-source (hybrid)

Syntax

```
clock-source ip-address {
  interface interface1-name;
  interface interface2-name;
}
```

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

interface *interface1-name*—Synchronous Ethernet interface traceable to the same PTP master clock.

interface *interface2-name*—Synchronous Ethernet interface traceable to the same PTP master clock.

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).

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 169
- Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 172
- Understanding Hybrid Mode on page 36
- Precision Time Protocol Overview on page 30
- Synchronous Ethernet Overview on page 21

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.

NOTE: **A boundary clock is not supported on the ACX Series routers for 12.2.**

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

- Configuring Precision Time Protocol on page 161
- Example: Configuring Precision Time Protocol on page 165
- Precision Time Protocol Overview on page 30
- IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers

clock-client

Syntax clock-client *ip-address*;

Hierarchy Level [edit protocols ptp master interface *interface-name* unicast-mode transport ipv4]

Release Information Statement introduced in Junos OS Release 12.2.

Description Configure the IP address of the slave.

Options *ip-address*—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

- Configuring Precision Time Protocol on page 161
- Example: Configuring Precision Time Protocol on page 165
- Precision Time Protocol Overview on page 30

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 **one-step**—One clock step to send timing information along with the synchronous message.

two-step—Two clock steps to send timing information and receive a subsequent follow-up message.

Default: one-step

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 161
- Example: Configuring Precision Time Protocol on page 165
- Precision Time Protocol Overview on page 30

config-button

Syntax

```
config-button {
  no-clear;
  no-rescue;
}
```

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 7.4.

Description (J Series Services Routers only) Configure the **CONFIG** button on the router to prevent resetting the router to the factory default or rescue configuration.

Options **no-clear**—Prevent resetting the router to the factory default configuration. You can still press and quickly release the button to reset to the rescue configuration (if one was set previously).

no-rescue—Prevent resetting the router to the rescue configuration. You can still press and hold the button for more than 15 seconds to reset to the factory default configuration.

When both the **no-clear** and **no-rescue** statements are present, the **CONFIG** button is deactivated for all types of reset.

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 Prevent the Resetting of the Factory Default or Rescue Configuration During Current Configuration Failure on J Series Routers on page 105

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 Configure the slave to enable it to retrieve Ethernet Synchronization Message Channel (ESMC) information from the Precision Time Protocol (PTP) clock class.

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.

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 169
- Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 172
- Precision Time Protocol Overview on page 30
- Synchronous Ethernet Overview on page 21
- Understanding ESMC Quality Level Mapping on page 32
- Understanding Hybrid Mode on page 36

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

- Configuring the Junos OS to Disable the Physical Operation of the Craft Interface on page 203

ct3

Syntax

```
ct3 {
  port port-number {
    t1 link-number {
      channel-group channel-number timeslots slot-number;
    }
  }
}
```

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*]

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure channelized T3 port and channel specifications.

Options **port** ***port-number***—Any valid T3 port number on the host system.

t1 ***link-number***—T1 link.

Range: 0 through 27

The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 135

degraded-fabric-detection-enable

Syntax degraded-fabric-detection-enable;

Hierarchy Level [edit chassis fabric degraded]

Release Information Statement introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Switches.

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

- Traffic Black Hole Caused by Fabric Degradation on page 185
- Disabling FPC Restart on page 194

degraded-fpc-bad-plane-threshold

Syntax degraded-fpc-bad-plane-threshold *number-bad-planes*;

Hierarchy Level [edit chassis fabric degraded]

Release Information Statement introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Switches.

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

- Traffic Black Hole Caused by Fabric Degradation on page 185
- Disabling FPC Restart on page 194

delay-request

Syntax delay-request *delay-request-value*;

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 ***delay-request-value***—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

- Configuring Precision Time Protocol on page 161
- Example: Configuring Precision Time Protocol on page 165
- Precision Time Protocol Overview on page 30

device-count

Syntax device-count *number*;

Hierarchy Level [edit chassis aggregated-devices ethernet]

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure the number of aggregated logical devices available to the router.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring Junos OS for Supporting Aggregated Devices on page 127

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

- Configuring the Junos OS to Enable a Routing Engine to Reboot on Hard Disk Errors on page 198

domain

Syntax domain *domain-value*;

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

- Configuring Precision Time Protocol on page 161
- Example: Configuring Precision Time Protocol on page 165
- Precision Time Protocol Overview on page 30

dynamic-profile-options

Syntax

```
dynamic-profile-options {
   versioning;
}
```

Hierarchy Level [edit system]

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

- Enabling Dynamic Profiles to use Multiple Versions

e1

Syntax

```
e1 port-number {
  channel-group channel-number timeslots slot-number;
}
```

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number* ce1]

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

- Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 116

egress-policer-overhead

Syntax egress-policer-overhead *bytes*;

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*]

Release Information Statement introduced before Junos OS Release 11.1.

Description Add the configured number of bytes to the length of a packet exiting the interface.

Options *bytes*—Number of bytes added to a packet exiting an interface.

Range: 0–255 bytes

Default: 0

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring a Policer Overhead on page 121
- **ingress-policer-overhead on page 309**
- 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.

Description Enable improved virtual private LAN service (VPLS) MAC address learning by supporting up to 262,143 MAC addresses per VPLS routing instance.

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 commit your configuration, a warning message prompts you to reboot the router. You must reboot the router and then modify the size of the VPLS MAC address table, otherwise the improved VPLS MAC address learning does not take effect.
- When the T4000 router reboots after the **enhanced-mode** statement is configured, only the T4000 Type 5 FPCs are online while the remaining FPCs are offline.

Default By default, the improved VPLS MAC address learning feature is disabled.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Network Services Mode Overview on page 39
- show chassis fpc on page 849
- mac-table-size

ethernet (Chassis)

Syntax

```
ethernet {
  device-count number;
  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

- Configuring Junos OS for Supporting Aggregated Devices on page 127
- Configuring LACP Link Protection of Aggregated Ethernet Interfaces (CLI Procedure)

fabric upgrade-mode

Syntax

```
fabric {
  upgrade-mode;
}
```

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

- TX Matrix Router and T640 Router Configuration Overview on page 43

family

Syntax

```
family {
  inet {
    layer-3;
    layer-4;
    symmetric-hash {
      complement;
    }
  }
  multiservice {
    source-mac;
    destination-mac;
    payload {
      ip {
        layer-3;
        layer-4;
      }
    }
    symmetric-hash {
      complement;
    }
  }
}
```

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number* hash-key]

Release Information Statement introduced in Junos OS Release 9.6.

Description (MX Series 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 **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 90

feeds (T640, T1600, and T4000 Routers with Six-Input DC Power Supply)

Syntax feeds *number-of-input-feeds*;

Hierarchy Level [edit chassis pem]
[edit chassis lcc *lcc-number* pem] (Routing Matrix)

Release Information Statement introduced in Junos OS Release 12.1.

Description 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.

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.

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.
- All power supplies in the router must use the same number of inputs feeds.

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
- Configuring the Six-Input DC Power Supply on page 205

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 Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Example: Configuring Packet Forwarding Engine FIB Localization on page 62

fib-remote

Syntax fib-remote;

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-remote.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Example: Configuring Packet Forwarding Engine FIB Localization on page 62

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

- Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels on page 196

fpc (M320, T320, T640 Routers)

Syntax

```
fpc slot-number {
  pic pic-number {
    ce1 {
      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.

Description Configure properties for the PICs in individual Flexible PIC Concentrators (FPCs).

Options *slot-number*—Slot number in which the FPC is installed.

Range: 0 through 7

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 110
- Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized (Multiplexed) Mode on page 114

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;
    }
  }
  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 introduced in Junos OS Release 9.3.

Description Configure properties for the DPC or MPC and corresponding Packet Forwarding Engines to create tunnel interfaces.

(MX Series Virtual Chassis only) To configure properties for MPCs in a member router in an MX Series Virtual Chassis configuration, you must specify the router's Virtual Chassis member number *before* the **fpc** statement. Specify the member number in the form **member** ***member-id***, where ***member-id*** is 0 or 1. If you do not specify the member number before the **fpc** statement, the commit operation fails and the software displays an error message indicating that the **fpc** statement must include the member number for routers in Virtual Chassis mode.

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
- Configuring Port-Mirroring Instances on MX Series 3D Universal Edge Routers on page 89
- Enabling Inline Service Interfaces

fpc (TX Matrix and TX Matrix Plus Routers)

Syntax

```
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;
    q-pic-large-buffer (large-scale | small-scale);
  }
}
```

Hierarchy Level [edit chassis lcc *number*]

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 *slot-number*—Slot number in which the FPC is installed.

Range: 0 through 7

The remaining statements are explained separately.

Required Privilege Level
interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- TX Matrix Router and T640 Router Configuration Overview on page 43
- TX Matrix Plus Router and T1600 Router Configuration Overview on page 48
- Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 110
- TX Matrix Router Chassis and Interface Names on page 46
- TX Matrix Plus Router Chassis and Interface Names on page 52

fpc-feb-connectivity

Syntax

```
fpc-feb-connectivity {
  fpc number feb (slot-number | none);
}
```

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 **fpc *number***—Specify the FPC slot number.

Range: 0 through 5

feb *slot-number*—Specify the FEB slot number.

Range: : 0 through 5

none—Disconnect the FPC from the FEB.

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 FPC to FEB Connectivity on M120 Routers on page 85

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, 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.

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.**

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 Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 125
- *TX Matrix Router Hardware Guide*

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

- Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 110

fru-poweron-sequence

Syntax fru-poweron-sequence *fru-poweron-sequence*;

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 10.0.
Statement introduced in Junos OS Release 12.1 for PTX Series packet transport switches.
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 switches) 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 switches) ***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 be 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 100
- Configuring the Power-On Sequence for FPCs on PTX Series Packet Transport Switches
- Configuring the Power-On Sequence for FPCs on T640, T1600, and T4000 Routers on page 103

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 161
- Example: Configuring Precision Time Protocol on page 165
- Precision Time Protocol Overview on page 30

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 90

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 169
- Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 172
- Understanding Hybrid Mode on page 36
- Precision Time Protocol Overview on page 30
- Synchronous Ethernet Overview on page 21

idle-cell-format

Syntax

```
idle-cell-format {
  itu-t;
  payload-pattern payload-pattern-byte;
}
```

Hierarchy Level

[edit chassis fpc *slot-number* pic *pic-number* idle-cell-format],
[edit chassis lcc *number* fpc *slot-number* pic *pic-number* 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

itu-t—Configure the idle cell header to use the International Telecommunications Union (ITU-T) standard of 0x00000001.

Default: (4 bytes): 0x00000000

payload-pattern-byte—Configure the idle cell payload pattern. The payload pattern byte can range from 0x00 through 0xff.

Default: cell payload (48 bytes)

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 Idle Cell Format and Payload Patterns for ATM Devices on page 180

inet (chassis)

Syntax

```
inet {
  layer-3;
  layer-4;
  symmetric-hash {
    complement;
  }
}
```

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number* 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 **layer-3**—Include Layer 3 IP data in the hash key.

layer-4—Include Layer 4 IP data in the hash key.

symmetric-hash—Configure symmetric hash key with source and destination ports.

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 90

ingress-policer-overhead

Syntax ingress-policer-overhead *bytes*;

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*]

Release Information Statement introduced before Junos OS Release 11.1

Description Add the configured number of bytes to the length of a packet entering the interface.

Options *bytes*—Number of bytes added to a packet entering an interface.

Range: 0–255 bytes

Default: 0

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring a Policer Overhead on page 121
- **egress-policer-overhead on page 291**

- CoS on Enhanced IQ2 PICs Overview

input-current (T4000 Routers with Six-Input DC Power Supply)

Syntax input-current *amps-in-each-feed*;

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 received in each feed.

NOTE: Before configuring input current for your router, see the *T4000 Core Router Hardware Guide* for special considerations.

Options **Values:**

- 40–Indicates 40A of input current is received in each feed.
- 60–Indicates 60A of input current is received 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

- Configuring the Six-Input DC Power Supply on page 205

lacp

Syntax

```
lacp {
  link-protection {
    non-revertive;
  }
  system-priority priority;
}
```

Hierarchy Level [edit chassis aggregated-devices ethernet]

Release Information Statement introduced in Junos OS Release 9.3.

Description For aggregated Ethernet interfaces only, configure Link Aggregation Control Protocol (LACP) parameters at the global level for use by LACP at the interface level.

Options The statements are described separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring Junos OS for Supporting Aggregated Devices on page 127

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).

Options *number*—Specify a T640 router or a T1600 on a routing matrix.

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

- TX Matrix Router and T640 Router Configuration Overview on page 43
- Using the Junos OS to Configure a T640 Router Within a Routing Matrix on page 57
- TX Matrix Plus Router and T1600 Router Configuration Overview on page 48
- Using the Junos OS to Configure a T1600 Router Within a Routing Matrix on page 73
- *TX Matrix Router Hardware Guide*
- *TX Matrix Plus Router Hardware Guide*

linerate-mode

Syntax linerate-mode;

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number* linerate-mode],
[edit chassis lcc *number* fpc *slot-number* pic *pic-number* 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

- Junos® OS Network Interfaces

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

- Configuring Junos OS for Supporting Aggregated Devices on page 127

local-ip-address (master)

Syntax local-ip-address *local-ip-address*;

Hierarchy Level [edit protocols ptp master interface *interface-name* unicast-mode clock-client *ip-address*]

Release Information Statement introduced in Junos OS Release 12.2.

Description The IP address of the interface acting as a master.

Options *local-ip-address*—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

- Configuring Precision Time Protocol on page 161
- Example: Configuring Precision Time Protocol on page 165
- Precision Time Protocol Overview on page 30

local-ip-address (slave)

Syntax local-ip-address *local-ip-address*;

Hierarchy Level [edit protocols ptp slave interface *interface-name* unicast-mode clock-source *ip-address*]

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 *local-ip-address*—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

- Configuring Precision Time Protocol on page 161
- Example: Configuring Precision Time Protocol on page 165
- Precision Time Protocol Overview on page 30

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;
      }
    }
  }
}
```

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 161
- Example: Configuring Precision Time Protocol on page 165
- Precision Time Protocol Overview on page 30

maximum-ecmp

Syntax maximum-ecmp *next-hops*;

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 **set protocols mpls static-label-switched-path**.

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.

Default 16

Options ***next-hops***—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

- Configuring ECMP Next Hops for RSVP and LDP LSPs for Load Balancing on page 131

maximum-links

Syntax maximum-links *maximum-links-limit*;

Hierarchy Level [edit chassis aggregated-devices]

Release Information Statement introduced in Junos OS Release 11.1 for T Series routers.
Statement introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport Switches.
Statement introduced in Junos OS Release 12.2 for the M Series and MX Series routers.

Description Configure the maximum links limit for aggregated devices.

Options ***maximum-links-limit***—Maximum links limit for aggregated devices.

Range: 16, 32; (PTX Series systems only in Junos OS Release 12.3) 64

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring Junos OS for Supporting Aggregated Devices on page 127
- Configuring an Aggregated Ethernet Interface

max-queues-per-interface

Syntax max-queues-per-interface (8 | 4);

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.
Support for TX Matrix and TX Matrix Plus added in Junos OS Release 9.6.
On MX Series routers, configure eight egress queues on Trio MPC/MIC interfaces.

Description On M320, T320, T640 , TX Matrix, and TX Matrix Plus routers, configure eight egress queues on IQ interfaces.

On MX Series routers, configure eight egress queues on Trio MPC/MIC interfaces.

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 Eight Queues on IQ Interfaces for T Series and M320 Routers on page 87
- Configuring Up to 16 Forwarding Classes
- Enabling Eight Queues on ATM Interfaces
- Configuring the Maximum Number of Queues for Trio MPC/MIC Interfaces

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
- Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels on page 196

mlfr-uni-nni-bundles

Syntax mlfr-uni-nni-bundles *number*;

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*]

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure link services management properties.

Options *number*—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 128

Default: 16

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 the Link Services PIC on page 118

multiservice

Syntax

```
multiservice {
  source-mac;
  destination-mac;
  payload {
    ip {
      layer-3 (source-ip-only | destination-ip-only);
      layer-4;
    }
  }
  symmetric-hash {
    complement;
  }
}
```

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number* 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 **destination-mac**—Include destination MAC address in the hash key.

payload—Include payload data in the hash key. This option has the following suboptions:

- **layer-3**—Include Layer 3 IP information in the hash key.
- **layer-4**—Include Layer 4 IP information in the hash key.

source-mac—Include source MAC address in the hash key.

symmetric-hash—Create a symmetric hash or symmetric hash complement key with any attribute.

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 90

network-services

Syntax network-services (ethernet | enhanced-ethernet | ip | enhanced-ip);

Hierarchy Level [edit chassis]

Release Information Statement introduced before Junos OS Release 8.5.
Options **enhanced-ethernet** and **enhanced-ip** introduced in Junos OS Release 11.4.

Description Set the router's network services to a specific mode of operation.

Options **ethernet**—Set the router's network services to Ethernet and use standard, compiled firewall filter format.

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.

ip—Set the router's network services to Internet Protocol and use standard, compiled firewall filter format.

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.

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.**

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 39
- Firewall Filters and Enhanced Network Services Mode Overview in the Junos OS Subscriber Management, Release 12.3
- Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 102

no-concatenate

Syntax no-concatenate;

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*],
[edit chassis lcc *number* fpc *slot-number* pic *pic-number*] (Routing Matrix)

Release Information Statement introduced before Junos OS Release 7.4.

Description Do not concatenate (multiplex) the output of a SONET/SDH PIC (an interface with a name **so-*fpc/pic/port***).

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**.

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.

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
- Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized (Multiplexed) Mode on page 114

no-multi-rate

Syntax no-multi-rate;

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*]

Release Information Statement introduced in Junos OS Release 11.2.

Description Disable the rate-selectability configuration. This statement is supported only on the 8-port SONET/SDH OC3/STM1 (Multi-Rate) MIC with SFP.

Default Rate-selectability is enabled.

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 123

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

- Configuring Junos OS for Supporting Aggregated Devices on page 127
- Configuring LACP Link Protection of Aggregated Ethernet Interfaces (CLI Procedure)

number-of-ports

Syntax number-of-ports *active-ports*;

Hierarchy Level [edit chassis fpc *slot-number*]

Release Information Statement introduced in Junos OS Release 10.1.

Description Enable or disable 8 or 12 physical ports on a 16-port 10-Gigabit Ethernet MPC (16x10GE 3D MPC).

Options ***active-ports***—Specify the number of ports (8 or 12) to enable or disable.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Number of Active Ports on a 16-Port 10-Gigabit Ethernet MPC on MX Series Routers on page 93

offline

Syntax offline;

Hierarchy Level [edit chassis lcc *number*]

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 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

- **online-expected on page 326**
- TX Matrix Router and T640 Router Configuration Overview on page 43
- TX Matrix Plus Router and T1600 Router Configuration Overview on page 48
- Configuring the Junos OS to Enable the TX Matrix Router to Generate an Alarm If a T640 Router Stays Offline on page 59
- Configuring the Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 Router Stays Offline on page 74

offline-on-fabric-bandwidth-reduction

Syntax offline-on-fabric-bandwidth-reduction;

Hierarchy Level [edit chassis fpc *slot-number*]

Release Information Statement introduced in Junos OS Release 12.1.

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

- Disabling an FPC with Degraded Fabric Bandwidth on page 194
- Traffic Black Hole Caused by Fabric Degradation on page 185

on-disk-failure (Chassis Routing Engine)

Syntax
```
on-disk-failure {
  disk-failure-action (halt | reboot);
}
```

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

- Configuring the Junos OS to Enable a Routing Engine to Reboot on Hard Disk Errors on page 198

on-error

Syntax

```
on-error {
  raise-alarm;
  power (cycle | off);
  write-coredump;
}
```

Hierarchy Level

[edit chassis fpc *slot-number* sanity-poll]
[edit chassis lcc *number* fpc *number* sanity-poll] (Routing Matrix)

Release Information

Statement introduced in Junos OS Release 11.4.

Description

Instruct the FPC to perform actions during an error condition.

Options

raise-alarm—Generate and display a chassis alarm in case of an error.

power cycle—Reboot the FPC after generating a core file. This statement is useful in case of temporary software errors that are eliminated after reboot.

power off—Halt the FPC and keep it offline. This statement is useful in case of permanent hardware failures.

CAUTION: The **power off** statement halts the FPC. Ensure that you have backup paths through different FPC 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** statement for an error.

write-coredump—Trigger the core file in case of an error.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring Sanity Polling for FPCs on T Series Routers on page 200
- sanity-poll on page 345
- retry-count on page 341

online-expected

Syntax online-expected;

Hierarchy Level [edit chassis lcc *number*]

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 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

- TX Matrix Router and T640 Router Configuration Overview on page 43
- TX Matrix Plus Router and T1600 Router Configuration Overview on page 48
- Configuring the Junos OS to Enable the TX Matrix Router to Generate an Alarm If a T640 Router Stays Offline on page 59
- Configuring the Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 Router Stays Offline on page 74
- **offline on page 323**

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**

NOTE: The packet-scheduling feature is available on M160 routers only.

Options **no-packet-scheduling**—Do not schedule packets.

packet-scheduling—Schedule packets to preserve interpacket gaps.

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 an M160 Router to Operate in Packet Scheduling Mode on page 84

payload

Syntax

```
payload {
  ip {
    layer-3;
    layer-4;
  }
}
```

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number* 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 **ip**—Include IPv4 payload data in the hash key. This option has the following suboptions:

- **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 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 90

pem (M320 Routers)

Syntax

```
pem {
  minimum number;
}
```

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 *number***—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

- Configuring the Junos OS to Support Entry-Level Configuration on an M320 Router with a Minimum Number of SIBs and PIMs on page 88
- sib on page 347

pem (T640, T1600, and T4000 Routers with Six-Input DC Power Supply)

Syntax

```
pem {
  feeds number-of-input-feeds;
  input-current amps-in-each-feed;
}
```

Hierarchy Level

[edit chassis]
[edit chassis lcc *lcc-number*] (Routing Matrix)

Release Information

Statement introduced in Junos OS Release 12.1.
Introduced the **feeds** option in Junos OS Release 12.1.
Introduced the **input-current** option 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 ***number-of-input-feeds***—Number of input feeds connected to the six-input DC power supply.

input-current ***amps-in-each-feed***—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

- Configuring the Six-Input DC Power Supply on page 205

pic (M Series, MX Series, and T Series Routers)

Syntax

```
pic pic-number {
  ce1 {
    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;
  }
  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 110
- Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized (Multiplexed) Mode on page 114
- Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 135
- Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 116

- Enabling Inline Service Interfaces

pic (TX Matrix and TX Matrix Plus Routers)

Syntax

```
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;
  q-pic-large-buffer (large-scale | small-scale);
}
```

Hierarchy Level [edit chassis lcc *number* fpc *slot-number*]

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 *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

- TX Matrix Router and T640 Router Configuration Overview on page 43
- TX Matrix Plus Router and T1600 Router Configuration Overview on page 48
- Configuring the Junos OS to Enable SONET/SDH Framing for SONET/SDH PICs on page 110

policer-drop-probability-low

Syntax policer-drop-probability-low;

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 11.4R1.

Description 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.

The **policer-drop-probability-low** statement is applicable to the following routing platforms:

- 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

- show pfe cfeb
- show pfe feb
- show pfe fpc

port (Chassis)

Syntax port *port-number*;

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number* ct3]

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure the channelized T3 port number on the PIC.

Options ***port-number***—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

- Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 135

power

Syntax power (off | on);

Hierarchy Level [edit chassis fpc *slot-number*]

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure the Flexible PIC Concentrator (FPC) to stay offline or to come online automatically.

Default **on**

Options **off**—Take the FPC offline, and configure it to stay offline, as, for example, after a system reboot.

on—Bring the FPC online, and configure it to come online automatically, as, for example, after a system reboot.

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 Make a Flexible PIC Concentrator Stay Offline on page 109

priority1

Syntax

priority1 *priority1-value*;

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 priority as one of the following:

- 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 *priority1-value*.
- 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.

Note that the lower value takes precedence.

Options

priority1-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

- Configuring Precision Time Protocol on page 161
- Precision Time Protocol Overview on page 30
- IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers

priority2

Syntax priority2 *priority2-value*;

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

- Configuring Precision Time Protocol on page 161
- Example: Configuring Precision Time Protocol on page 165
- Precision Time Protocol Overview on page 30
- IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers

q-pic-large-buffer

Syntax q-pic-large-buffer (large-scale | small-scale);

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 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 *N*xDS0 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 119
- Configuring Schedulers

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

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

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 169
- Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 172
- Understanding Hybrid Mode on page 36
- Precision Time Protocol Overview on page 30
- Synchronous Ethernet Overview on page 21

red-buffer-occupancy

Syntax

```
red-buffer-occupancy {
  weighted-averaged [ instant-usage-weight-exponent exponent-value ];
}
```

Hierarchy Level

[edit chassis fpc *slot-number* pic *pic-number*],
[edit chassis lcc *number* fpc *slot-number* pic *pic-number*]

Release Information

Statement introduced in Junos OS Release 8.3.

Description

Configure the IQ PIC to base random early detection (RED) queue management on a *simple moving average* buffer occupancy calculation. If you do not include this statement, the IQ PIC bases RED on an *instantaneous* buffer occupancy value. As an option, you can specify that the IQ PIC bases RED on a *weighted moving average* of buffer occupancy values.

Options

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.

instant-usage-weight-exponent *exponent-value*—(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.

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 *operational* value of 31, which results in a weight value of $2^{-31} = 1 / 2^{31}$ = 0.0000000004656612873077392578125.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring Weighted RED Buffer Occupancy
- Example: Configuring Weighted RED Buffer Occupancy

redundancy-mode

Syntax redundancy-mode (increased-bandwidth | redundant)

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 Switch Control Board (SCB) with Trio chips and the MPC3E, the control boards operate in redundancy fabric mode (all the FPCs use 4 fabric planes as active planes) by default.

Options **increased-bandwidth**—Enable increased fabric bandwidth mode for the control boards, which causes all the available fabric planes to be used.

redundant—Enable redundancy mode for the control boards, which causes all the FPCs to use 4 fabric planes as active planes.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Detection and Corrective Actions of FPCs with Degraded Fabric on MX Series Routers on page 192
- Detection and Recovery of Fabric-Related Failures Caused by Traffic Black Holes on MX Series Routers on page 186
- Corrective Actions for Fabric Failures on MX Series Routers on page 189
- Router Chassis Configuration Statements on page 265
- **show chassis fabric redundancy-mode on page 794**
- Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 195

retry-count

Syntax retry-count *number;*

Hierarchy Level [edit chassis fpc *slot-number* sanity-poll]
[edit chassis lcc *number* fpc *number* sanity-poll] (Routing Matrix)
[edit chassis cluster redundancy-group *group-number* ip-monitoring]

Release Information Statement introduced in Junos OS Release 11.4.

Description Number of times sanity polling periodically checks for an error condition in the FPC.

Options *number*—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

- Configuring Sanity Polling for FPCs on T Series Routers on page 200
- sanity-poll on page 345
- on-error on page 325

route (chassis)

Syntax route;

Hierarchy Level [edit chassis memory-enhanced]

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

- Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels on page 196

routing-engine (Chassis)

Syntax

```
routing-engine {
  on-disk-failure {
    disk-failure-action (halt | reboot);
  }
}
```

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

- Configuring the Junos OS to Enable a Routing Engine to Reboot on Hard Disk Errors on page 198
- *Junos High Availability Configuration Guide*

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.

Related Documentation

- Example: Configuring Packet Forwarding Engine FIB Localization on page 62

route-memory-enhanced

Syntax route-memory-enhanced;

Hierarchy Level [edit chassis]

Release Information Statement added in Junos OS Release 9.6.

Description Reallocate the jtree memory on the Packet Forwarding Engine to allocate more memory for routing tables, and Layer 3 VPNs. This statement is supported 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
- T640, T1600, and TX routers with Enhanced Scaling FPC3 and Enhanced Scaling FPC4

NOTE: For T Series routers only. With Junos OS Release 10.2, enhanced jtree memory allocation is turned OFF by default. For Junos OS Release 9.3 to 10.1, the default routing tables (inet.0 and inet6.0) use both memory segments by default.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels on page 196

sampling-instance

Syntax sampling-instance *instance-name*;

Hierarchy Level [edit chassis fpc *slot-number*]
[edit chassis lcc *number* fpc *slot-number*] (Routing Matrix)

Release Information Statement introduced in Junos OS Release 9.6.

Description (MX Series, M120, M320, and T Series routers only) Associate a defined sampling instance with a specific Packet Forwarding Engine for active sampling instances configured at the **[edit forwarding-options sampling]** hierarchy level.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Associating Sampling Instances for Active Flow Monitoring with a Specific Packet Forwarding Engine on page 198
- *Junos Services Interfaces Configuration Guide*

sanity-poll

Syntax

```
sanity-poll {
  retry-count number;
  on-error {
    raise-alarm;
    power (cycle | off);
    write-coredump;
  }
}
```

Hierarchy Level

[edit chassis fpc *slot-number*]
[edit chassis lcc *number* fpc *number*] (Routing Matrix)

Release Information

Statement introduced in Junos OS Release 11.4.

Description

Enable sanity polling and start periodic sanity checking for a particular FPC. The periodic sanity check includes checking for error conditions such as “register sanity issues,” “high temperature,” “hardware failure,” and so on in the FPC.

NOTE: **Currently, periodic sanity check is performed only on the routing chip register.**

Options

The remaining statements are explained separately.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring Sanity Polling for FPCs on T Series Routers on page 200
- retry-count on page 341
- on-error on page 325

service-package

Syntax service-package (layer-2 | layer-3);

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number* 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

- Configuring the Junos OS to Enable Service Packages on Adaptive Services Interfaces on page 141
- Configuring the Junos OS to Support Layer 2 Services on MX Series 3D Universal Edge Routers with MS-DPCs on page 101
- *Junos Services Interfaces Configuration Guide*

session-offload

Syntax session-offload;

Hierarchy Level [edit chassis fpc *slot-number* pic *number* 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

- Configuring the Junos OS to Enable Session Offloading on MX Series 3D Universal Edge Routers with MS-DPCs on page 101

sfm (Chassis)

Syntax sfm *slot-number* power off;

Hierarchy Level [edit chassis]

Release Information Statement introduced before Junos OS Release 7.4.

Description For routers with SFMs, configure an SFM to stay offline.

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.

Options ***slot-number***—Slot number in which the SFM is installed.

power off—Take the SFM offline and configure it to remain offline.

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 Make an SFM Stay Offline on page 84
- *Junos High Availability Configuration Guide*

sib

Syntax

```
sib {
  minimum number;
}
```

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 ***number***—Minimum number of SIBs 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

- Configuring the Junos OS to Support Entry-Level Configuration on an M320 Router with a Minimum Number of SIBs and PIMs on page 88
- **pem on page 329**

sonet

Syntax

```
sonet {
  device-count number;
}
```

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

- Configuring Junos OS for Supporting Aggregated Devices on page 127

slave

Syntax

```
slave {
  announce-interval announce-interval-value
  announce-timeout announce-timeout-value;
  delay-request delay-request-value;
  frequency-only;
  grant-duration interval
  interface interface-name {
    unicast-mode {
      transport ipv4;
      clock-source ip-address {
        local-ip-address local-ip-address {
          asymmetry number;
        }
      }
    }
  }
  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 161
- Example: Configuring Precision Time Protocol on page 165
- Precision Time Protocol Overview on page 30
- IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers

sparse-dlcis

Syntax sparse-dlcis;

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number*];

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 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 the Sparse DLCI Mode on Channelized STM1 or Channelized DS3 PICs on page 114

speed

Syntax speed (oc3-stm1 | oc12-stm4 | oc48-stm16);

Hierarchy Level [edit chassis fpc *slot-number* pic *pic-number* port *port-number*]

Release Information Statement introduced in Junos OS Release 11.2.

Description Configure the port speed. This statement is supported only on the SONET/SDH (Multi-Rate) MICs with SFP, the Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP, and ATM MICs.

Default **oc3-stm1**

Options **oc3-stm1**—OC3 or STM1.

oc12-stm4—OC12 or STM4.

oc48-stm16—OC48 or 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.

Also, for ATM MICs, you can configure the **oc12-stm4** port speed option only for ports 0 and 4. 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.

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 123

symmetric-hash

Syntax

```
symmetric-hash {
  complement;
}
```

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

- Configuring PIC-Level Symmetrical Hashing for Load Balancing on 802.3ad LAGs for MX Series Routers on page 90

synchronization (M Series, T Series, and PTX Series)

Syntax

```
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;
}
```

Hierarchy Level [edit chassis]

Release Information Statement introduced in Junos OS Release 7.6.
Statement introduced in Junos OS Release 9.3 for M120 routers.
Statement introduced in Junos OS Release 10.2 for T320, T640, and T1600 routers.
Statement introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport Switches.

Description (M320, M40e, M120, T320, T640, and T1600 routers and PTX Series Packet Transport Switches 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 **primary**—First external timing source specified in the configuration hierarchy. This statement has the following suboptions:

- **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 Switch, replace *slot-number* 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.

secondary—Second external timing source specified in the configuration hierarchy.

- **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 Switch, 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 Switches.

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 143

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 {
      signal-type (2048khz | e1 | t1);
      e1-options {
        framing (g704 | g704-no-crc4);
        line-encoding (ami | hdb3);
        sabit number;
      }
      t1-options {
        framing (esf | sf);
        line-encoding (ami | b8zs);
      }
    }
  }
  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;
    }
  }
  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);
    }
    interfaces (interface-name | external){
      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);
}
```

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 (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 for MX Series Routers" on page 145.

(MX240, MX480, and MX960 routers with Enhanced MX SCB) Configure centralized clocking parameters.

- Starting in Junos 12.2, configure distribution of the selected chassis clock source to downstream network elements through supported line interfaces.
- Starting in Junos 12.3, configure an external building-integrated timing supply (BITS) timing source. You can also configure the selected chassis clock, or an incoming Synchronous Ethernet or PTP line source for transmission out the external interface.

For configuration details, see "Example: Configuring Centralized Clocking on the Enhanced MX Switch Control Board" on page 256.

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—(Enhanced MX SCB only) 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 (2048khz | e1 | t1)**—Specify the external interface signal type:
  - **2048khz**—2048-KHz clock signal
  - **e1**—E1-coded 2048-KHz signal on 120-ohm balanced line
  - **t1**—T1-coded 1.544-MHz signal on 100-ohm balanced line
- **e1-options**—Specify the E1 options:
  - **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
  - **line-encoding (ami | hdb3)**—Specify the line encoding:
    - **ami**— Alternate mark inversion (AMI)
    - **hdb3**—High-d Density bipolar 3 code (HDB3)
  - **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:
  - **framing (esf | sf)**—Specify the framing format:
    - **esf**—Extended superframe (ESF)
    - **sf**—Superframe (SF)

- **line-encoding (ami | b8zs)**—Specify the line encoding:
  - **ami**— Alternate mark inversion (AMI)
  - **b8zs**—8-bit zero suppression, bipolar with 8-zero substitution (B8ZS)

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—(Enhanced MX SCB 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 25 on page 359). If the quality level of the output clock source drops below the configured minimum quality level threshold, the external output clock is squelched.

Table 25: 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:
  - **chassis**—Chassis clock for output
  - **line**—Best line clock source for output
- **tx-dnu-to-line-source-enable**—Set Tx QL 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 (QL) parameter for a Synchronous Ethernet interface is optional when quality mode is enabled and the selection mode is set to **received-quality**. The default QL for a Synchronous Ethernet interface is based on the value of **network-option**: **option-1** selects **SEC** and **option-2** selects **ST3**. Table 26 on page 360 shows whether SSM QL is supported for a given external interface signal type and framing. The default setting is disabled.

Table 26: SSM-QL Support by Signal Type and Framing

Signal Type	Framing	SSM QL 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.

- When the **selection-mode** statement is set as **configured-quality**, the clock source selection algorithm uses the ESMC or SSM quality level configured for a qualifying interface.
- When the **selection-mode** statement is set as **received-quality**, the clock source selection algorithm uses the ESMC or SSM quality level received on the qualifying 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.**

source (external-a | external-b | interfaces (*interface-name* | external))—Specify clock sources. The primary clock source is **external-a**, the secondary clock source is **external-b**. The clock source is chosen using the clock selection process.

(Enhanced MX SCB only) Specify the **external** interface to select the external clock source configured in **interfaces external**.

- **priority** *number*—Specify a priority level from 1 to 5. When not specified, **external-a** has higher default priority than **external-b**, and **external-b** 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 25 on page 359.

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 QL 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 (QL) are supported:
    - For option-1, QL must be configured for external clocks (**external-a** or **external-b**) whether or not QL is enabled.
    - For option-2, the default QL for external clocks is QL_STU whether or not QL is enabled.
  - QL 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.
- **wait-to-restore** *minutes*—(**interfaces** only) Specify a time for each port to be up before opening the ESMC—from 0 through 12 minutes. 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.

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.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Synchronous Ethernet Overview on page 21
- **show chassis synchronization (MX Series Routers) on page 1081**
- Configuring Clock Synchronization Interface for MX Series Routers on page 145
- Example: Configuring Framing Mode for Synchronous Ethernet on MX Series Routers with 10-Gigabit Ethernet MIC on page 157
- Example: Configuring Centralized Clocking on the Enhanced MX Switch Control Board on page 256
- request chassis synchronization mode
- Clock Sources for PTX Series Packet Transport Switches on page 150

synchronous-ethernet-mapping

Syntax

```
synchronous-ethernet-mapping {
  clock-source ip-address {
    interface interface1-name;
    interface interface2-name;
  }
}
```

Hierarchy Level [edit protocols ptp slave hybrid]

Release Information Statement introduced in Junos OS Release 12.2R2.

Description Configure the Synchronous Ethernet mapping for 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 169
- Example: Configuring Hybrid Mode and ESMC Quality Level Mapping on page 172
- Understanding Hybrid Mode on page 36
- Precision Time Protocol Overview on page 30
- Synchronous Ethernet Overview on page 21

system-priority

Syntax system-priority *priority*;

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 Define LACP system priority for aggregated Ethernet interfaces at the global (chassis) level.

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.

Options *priority*—Priority for the aggregated Ethernet system. A smaller value indicates a higher priority.

Range: 0 through 65535

Default: 127

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring Junos OS for Supporting Aggregated Devices on page 127
- Configuring LACP Link Protection of Aggregated Ethernet Interfaces (CLI Procedure)

t1

Syntax

t1 *link-number* {
   channel-group *channel-number* timeslots *slot-number*;
}

Hierarchy Level

[edit chassis fpc *slot-number* pic *pic-number* ct3 port *port-number*];

Release Information

Statement introduced before Junos OS Release 7.4.

Description

Configure channelized T1 port and channel specifications.

Options

link-number—T1 link.

Range: 0 through 27 for DS0 naming

The remaining statements are explained separately.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 135

traffic-manager

Syntax

```
traffic-manager {
  egress-shaping-overhead number;
  ingress-shaping-overhead number;
  mode {
    egress-only;
    ingress-and-egress;
    session-shaping;
  }
}
```

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 in Junos OS Release 8.3.

Description Enable CoS queueing, scheduling, and shaping.

NOTE: **Junos OS does not support ingress-and-egress mode on label-switched interfaces (LSI) configured with VPLS .**

Options **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 queuing 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**—(M10i and M120 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.

transport (slave)

Syntax transport ipv4;

Hierarchy Level [edit protocols ptp slave interface *interface-name* unicast-mode]

Release Information Statement introduced in Junos OS Release 12.2.

Description Configure the encapsulation type for Precision Time Protocol (PTP) packet transport . Currently, IPv4 is the only supported encapsulation type for PTP.

The remaining statements are explained separately.

Options **IPv4**—The encapsulation type for Precision Time Protocol packet transport as IPv4.

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 161
- Example: Configuring Precision Time Protocol on page 165
- Precision Time Protocol Overview on page 30

transport (master)

Syntax transport ipv4;

Hierarchy Level [edit protocols ptp master interface *interface-name* unicast-mode]

Release Information Statement introduced in Junos OS Release 12.2.

Description Configure the encapsulation type for Precision Time Protocol packet transport. Currently, IPv4 is the only supported encapsulation type for PTP.

The remaining statements are explained separately.

Options **IPv4**—The encapsulation type for Precision Time Protocol packet transport as IPv4.

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 161
- Example: Configuring Precision Time Protocol on page 165
- Precision Time Protocol Overview on page 30

tunnel-services (Chassis)

Syntax

```
tunnel-services {
  bandwidth (1g | 10g | 20g | 40g);
  tunnel-only;
}
```

Hierarchy Level [edit chassis fpc *slot-number* pic *number*]

Release Information Statement introduced in Junos OS Release 8.2.

Description For MX Series 3D Universal Edge Routers, configure the amount of bandwidth for tunnel services.

For M7i, M10i, M120, M320, T Series and TX Matrix routers with IQ2 PICs and IQ2E PICs, configure support for per unit scheduling for GRE tunnels. You can specify the IQ2 and IQ2E PICs to work exclusively in tunnel mode or as a regular PIC. The default setting uses IQ2 and IQ2E PICs as a regular PIC. If you do not configure the **tunnel-only** option, the IQ2 and IQ2 PICs operate as regular PICs. For M7i, M10i, M120, M320, T Series and TX Matrix routers with IQ2 PICs and IQ2E PICs, you can use the **tunnel-only** option to specify that an IQ2 or IQ2E PIC work in tunnel mode only.

NOTE: **Bandwidth rates of 20 gigabits per second and 40 gigabits per second require use of an MX Series router with the 100-Gigabit Ethernet Modular Port Concentrator (MPC) and the 100-Gigabit CFP MIC.**

Options **tunnel–only** (Optional)—For M7i, M10i, M120, M320, T Series and TX Matrix routers with IQ2 PICs and IQ2E PICs, specify that an IQ2 or IQ2E PIC work in tunnel mode only.

The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC on page 253
- Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 254
- Example: Configuring Tunnel Interfaces on the MPC3E on page 254
- **bandwidth (Tunnel Services) on page 276**

- [edit chassis] Hierarchy Level
- Configuring Layer 3 Tunnel Services Interfaces on an MX Series Router with a DPC

ucode-imem-remap

Syntax ucode-imem-remap;

Hierarchy Level [edit chassis feb slot *number*]

Release Information Statement introduced in Junos OS Release 10.4R2.

Description 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.

You can enable the microcode remap by using the **ucode-imem-remap** statement at the [**edit chassis feb slot** ***number***] hierarchy level. The default microcode map will continue to be available if the **ucode-imem-remap** statement is not configured.

NOTE: **On M120 routers, the FEB is automatically restarted once the ucode-imem-remap statement is configured and committed.**

Required Privilege Level interfaces—To view this statement in the configuration.
interfaces-control—To add this statement to the configuration.

Related Documentation

- Router Chassis Configuration Statements on page 265

unicast-mode (master)

Syntax

```
unicast-mode {
  transport ipv4;
  clock-client ip-address {
    local-ip-address local-ip-address;
  }
}
```

Hierarchy Level [edit protocols ptp master interface *interface-name*]

Release Information Statement introduced in Junos OS Release 12.2.

Description Configure the master in unicast mode. You can set this option when PTP unicast mode of messaging is needed.

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 161
- Example: Configuring Precision Time Protocol on page 165
- Precision Time Protocol Overview on page 30

unicast-mode (slave)

Syntax

```
unicast-mode {
  clock-source ip-address {
    local-ip-address local-ip-address;
      asymmetry number;
    }
  }
  transport ipv4;
}
```

Hierarchy Level [edit protocols ptp slave interface *interface-name*]

Release Information Statement introduced in Junos OS Release 12.2.

Description Configure the slave in unicast mode. You can set this option when PTP unicast mode of messaging is needed.

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 161
- Example: Configuring Precision Time Protocol on page 165
- Precision Time Protocol Overview on page 30
- IEEE 1588v2 Precision Timing Protocol (PTP) on ACX Series Universal Access Routers

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.

NOTE:

When unicast negotiation is enabled, you cannot commit any packet rate–related configuration.

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 161
- Example: Configuring Precision Time Protocol on page 165
- Precision Time Protocol Overview on page 30
- 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

- Configuring the Junos OS to Allocate More Memory for Routing Tables, Firewall Filters, and Layer 3 VPN Labels on page 196

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

- Configuring Path MTU Checks for VPNs
- Configuring the Junos OS to Enable MTU Path Check for a Routing Instance on M Series Routers on page 82

vtmapping

Syntax
vtmapping (itu-t | klm);

Hierarchy Level
[edit interfaces *interface-name* sonet-options];
[edit chassis fpc *number* pic *number*]

Release Information
Statement introduced before Junos OS Release 7.4.

Description
For the Channelized STM1 IQ PIC or Channelized STM1 PIC, configure virtual tributary mapping.

For the Channelized STM1 PIC, you configure virtual tributary mapping at the **[edit chassis fpc *number* pic *number*]** hierarchy level.

Options
itu-t—International Telephony Union standard.

klm—KLM standard.

Default: **klm**

Required Privilege Level
interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- Configuring Virtual Tributary Mapping of Channelized STM1 Interfaces
- Configuring the Junos OS to Support Channelized STM1 Interface Virtual Tributary Mapping on page 137

PART 3

Administration

CHAPTER 27

Administrative Commands

clear chassis display message

Syntax clear chassis display message

Syntax (TX Matrix Router) clear chassis display message
<lcc *number* | scc>

Syntax (TX Matrix Plus Router) clear chassis display message
<lcc *number* | sfc *number*>

Syntax (QFabric Systems) clear chassis display message
<node-device *name* | interconnect-device *name*>

Release Information Command introduced in Junos OS Release 7.5.
Command introduced in Junos OS Release 9.0 for EX Series switches.
sfc option for the TX Matrix Plus routers introduced in Junos OS Release 9.6.
Command introduced in Junos OS Release 11.1 for the QFX Series.

Description (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.

Options **none**—Clear or stop a text message on the craft interface display.

interconnect-device ***name***—(QFabric systems only) (Optional) On a QFabric system, clear or stop a text message on the LCD panel display on the specified Interconnect device.

lcc ***number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, clear or stop a text message on the craft interface on a specific T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, clear or stop a text message on the craft interface on a specific T1600 router that is connected to the TX Matrix Plus router. Replace ***number*** with a value from **0** through **3**.

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 (or 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 423
- show chassis craft-interface

List of Sample Output clear chassis display message on page 381

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      |
     +--------------------+
```


request chassis cb

Syntax

request chassis cb (offline | online) slot *slot-number*

Syntax (TX Matrix Router)

request chassis cb (offline | online) <slot *slot-number* | lcc *number* slot *cb-slot-number* | scc *number* slot *cb-slot-number*>

Syntax (TX Matrix Plus Router)

request chassis cb (offline | online) <slot *slot-number* | lcc *number* slot *cb-slot-number* | sfc *number* slot *cb-slot-number*>

Syntax (QFabric System)

request chassis cb (offline | online) interconnect-device *name* slot *slot-number*
<interconnect-device *name* slot *slot-number* (offline | online)>

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 EX Series Switches Hardware and CLI Terminology Mapping.

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 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.

sfc ***number***—(TX Matrix Plus routers only) (Optional) Change the CB status for the TX Matrix Plus router (or switch-fabric chassis). Replace ***number*** with 0.

Required Privilege Level

maintenance

Related Documentation

- show chassis environment cb on page 509
- Switching Control Board Redundancy
- Routing Engine and Switching Control Board Redundancy Configuration Statements

List of Sample Output

request chassis cb on page 384
request chassis cb interconnect-device (QFabric System) on page 384
request chassis cb (MX2020 Router) on page 384
request chassis cb (MX2010 Router) on page 384

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 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 **offline**—Take the CFEB offline.

online—Bring the CFEB online.

restart—Restart the CFEB.

Required Privilege Level maintenance

Related Documentation

- show chassis cfeb on page 443
- Configuring CFEB Redundancy on the M10i Router
- CFEB Overview

List of Sample Output request chassis cfeb on page 385

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 request chassis cip (offline | online) slot *slot-number*

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 **offline**—Take the CIP offline.

online—Bring the CIP online.

slot *slot-number*—CIP slot number. Replace ***slot-number*** with a value ranging from 0 through 1.

Required Privilege Level maintenance

Related Documentation

- show chassis cip on page 445
- Installing a T1600 CIP
- Installing a T640 CIP
- Installing a TX-CIP
- Installing an M320 CIP
- Installing the M40e CIP
- Installing the T1600 CIP
- Installing the T320 CIP
- CIP Overview

List of Sample Output

request chassis cip offline slot (TX Matrix Plus Router) on page 386
request chassis cip offline slot (TX Matrix Plus Router) on page 386

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 fabric plane

Syntax request chassis fabric plane *plane-number* (offline | online)

Release Information Command introduced in Junos OS Release 8.0.
Command introduced in Junos OS Release 9.4 for EX Series switches.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Description Control the operation of the specified fabric plane.

Options **offline**—Take the fabric plane offline. Use the **request chassis fabric plane *plane-number* offline** command to clear a **FAULT** state on a fabric plane. To bring the fabric plane back online, use the **request chassis fabric plane *plane-number* online** command.

online—Bring the fabric plane online.

plane *plane-number*—Fabric plane number.

- For the M120 router, replace ***plane-number*** with a value from 0 through 3.
- For the MX480 and MX240 routers, replace ***plane-number*** with a value from 0 through 7.
- For the MX2020 and MX2010 routers, replace ***plane-number*** with a value from 0 through 7.
- For the MX960 router, replace ***plane-number*** with a value from 0 through 5.
- For the EX8208 switch, replace ***plane-number*** with a value from 0 through 11.
- For the EX8216 switch, replace ***plane-number*** with a value from 0 through 7.

Required Privilege Level maintenance

Related Documentation

- show chassis fabric plane on page 751
- show chassis fabric plane-location on page 790
- show chassis fabric summary
- Creating a Fabric Port Group
- Fabric Management Overview

List of Sample Output
request chassis fabric plane 0 online on page 388
request chassis fabric plane 0 offline on page 388
request chassis fabric plane 0 online (EX8200 switch) on page 388
request chassis fabric plane (MX2020 Router) on page 388
request chassis fabric plane (MX2010 Router) on page 388

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

Syntax request chassis feb (offline | online | restart) slot *slot-number*

Syntax (ACX Series Routers) request chassis feb restart slot *slot-number*

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 *slot-number*—FEB slot number. Replace ***slot-number*** with a value from 0 through 5.

Required Privilege Level maintenance

Related Documentation

- show chassis feb on page 832
- show chassis fabric feb on page 709
- show chassis fpc-feb-connectivity on page 876

- feb
- Switching Control Board Redundancy

List of Sample Output

request chassis feb offline slot 0 on page 390
request chassis feb online slot 0 on page 390
request chassis feb restart slot 0 on page 390

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

Syntax
request chassis fpc (offline | online | restart) slot *slot-number*

Syntax (TX Matrix and TX Matrix Plus Routers)
request chassis fpc (offline | online | restart) slot *slot-number*
<lcc *number*>

Syntax (MX Series Routers)
request chassis fpc (offline | online | restart) slot *slot-number*
<all-members>
<local>
<member *member-id*>

Syntax (MX2020 3D Universal Edge Routers)
request chassis fpc (offline | online | restart) slot *slot-number*

Syntax (MX2010 3D Universal Edge Routers)
request chassis fpc (offline | online | restart) slot *slot-number*

Syntax (QFabric System)
request chassis fpc
<interconnect-device *name* slot *slot-number* (offline | online)>
<(offline | online) interconnect-device *name* slot *slot-number*>
<slot *slot-number* interconnect-device *name* (offline | online)>

Syntax (PTX Series Packet Transport Switches)
request chassis fpc (offline | online | restart) slot *slot-number*

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 11.3 for QFX Series.
Command introduced in Junos OS 12.1 for PTX Series Packet Transport Switches.
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
(M20, M40, M40e, M120, M160, M320, MX Series, and T Series routers, QFabric systems, EX Series switches, and PTX Series Packet Transport Switches only) Control the operation of the Flexible PIC Concentrator (FPC). For information about the meaning of “FPCs” on the switches, see EX Series Switches Hardware and CLI Terminology Mapping.

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 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> 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 Switch—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 and TX Matrix Plus routers only) (Optional) On a TX Matrix router, control the FPC in a specified T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, control the FPC in a specified T1600 router that is connected to the TX Matrix Plus router. Replace ***number*** with a value from 0 through 3.

Required Privilege Level maintenance

Related Documentation

- show chassis fpc on page 849
- show chassis fpc-feb-connectivity on page 876
- show chassis fabric fpcs on page 714
- Configuring the Junos OS to Make a Flexible PIC Concentrator Stay Offline on page 109
- Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 125
- MX960 Flexible PIC Concentrator Description

List of Sample Output

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

```
user@host> request chassis fpc slot 0
```

with Media Services Blade [MSB])

```
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

Syntax request chassis fpm resync

Syntax (TX Matrix Routers) request chassis fpm resync (lcc *number* | scc)

Syntax (TX Matrix Plus Routers) request chassis fpm resync (lcc *number* | sfc *number*)

Syntax (MX Series Routers) request chassis fpm resync
<all-members>
<local>
<member *member-id*>

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 *number*—(TX Matrix and TX Matrix Plus routers only) On a TX Matrix router, resynchronize the craft interface status on a specified T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, resynchronize the craft interface status on a specified T1600 router that is connected to the TX Matrix Plus router. Replace ***number*** with a value from **0** through **3**.

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 (or 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 555
- Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 125

List of Sample Output request chassis fpm resync on page 396
request chassis fpm resync (MX2010 Router) on page 396

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 Router) request chassis lcc (offline | online) slot *slot-number*

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 router (or line-card chassis) that is connected to the TX matrix router. On a TX Matrix Plus router, control the operation of a T1600 router (or line-card chassis) that is connected to the TX Matrix Plus router.

Options

offline—On a routing matrix based on the TX Matrix router (or switch-card chassis), take the T640 router (or line-card chassis) offline. On a routing matrix based on a TX Matrix Plus router (or switch-fabric chassis), take the T1600 router (or line-card chassis) offline.

online—On a routing matrix based on the TX Matrix router (or switch-card chassis), bring the T640 router (or line-card chassis) online. On a routing matrix based on a TX Matrix Plus router (or switch-fabric chassis), bring the T1600 router (or line-card chassis) online.

slot *slot-number*—On a TX Matrix router (or switch-card chassis), the slot number of a T640 router (or line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router (or switch-fabric chassis), the slot number of a T1600 router (or line-card chassis) that is connected to the TX Matrix Plus (or switch-fabric chassis) router. Replace ***slot-number*** with a value from **0** through **3**.

Required Privilege Level maintenance

Related Documentation

- show chassis lccs on page 984
- Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade (CLI Procedure)
- fpc

List of Sample Output request chassis lcc on page 397

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 request chassis mcs (offline | online | restart) slot *slot-number*

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 **offline**—Take the MCS offline.

online—Bring the MCS online.

restart—Restart the MCS.

slot *slot-number*—MCS slot number. Replace ***slot-number*** with 0 or 1.

Required Privilege Level maintenance

Related Documentation

- show chassis environment mcs on page 576

List of Sample Output request chassis mcs on page 398

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.

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.**

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.
- 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**.
- 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 878

List of Sample Output request chassis mic online on page 400
request chassis mic (MX Routers with Media Services Blade [MSB]) on page 400
request chassis mic onine (MX2010 Router) on page 400

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 onine (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 request chassis optics fpc-slot *fpc-slot-number* reactivate

Release Information Command introduced in Junos OS Release 12.3 for MX240, MX480, and MX960 3D Universal Edge Routers.

Description (MX240, MX480, MX960 routers) Control the status of the optical transceiver.

Options **fpc-slot *fpc-slot-number***—Slot number of the line card that houses the optical transceiver.

- MX240 router—Replace ***fpc-slot-number*** with a value from 0 through 2.
- MX480 router—Replace ***fpc-slot-number*** with a value from 0 through 5.
- MX960 router—Replace ***fpc-slot-number*** with a value from 0 through 11.

reactivate—Reactivate the optical transceiver.

Required Privilege Level maintenance

Related Documentation

- Supported Network Interface Standards by Transceiver
- CHASSISD System Log Messages

List of Sample Output request chassis optics (MX480 router) on page 401

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 request chassis pcg (offline | online) slot *slot-number*

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 ***slot-number***—PCG slot number. Replace ***slot-number*** with **0** or **1**.

Required Privilege Level maintenance

Related Documentation

- show chassis environment pcg on page 578

List of Sample Output request chassis pcg on page 402

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

Syntax

request chassis pic (offline | online) fpc-slot *slot-number* pic-slot *slot-number*

Syntax (ACX4000 Series Routers)

request chassis pic (offline | online) fpc-slot *slot-number* pic-slot *slot-number*

Syntax (TX Matrix and TX Matrix Plus Routers)

request chassis pic (offline | online) fpc-slot *slot-number* pic-slot *slot-number*
<lcc *number*>

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.

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: 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.
```

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.
- M120 routers—0 through 5.
- MX960 routers—0 through 11.
- M40, M40e, M160, M320, T320, T640, and T1600 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 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> **request chassis pic fpc-slot 1 lcc 1 pic-slot 0 offline**
  user@host> **request chassis pic fpc-slot 9 pic-slot 0 offline**

pic-slot ***slot-number***—PIC slot number. For the M Series router, the T640 router, the T1600 router, the TX Matrix and TX Matrix Plus routers, it can be 0, 1, 2, or 3. On the MX960 router, ***slot-number*** corresponds to the slot number of the Packet Forwarding Engine. For the T320 router, it can be 0 or 1. For EX3200 and EX4200 switches, it is 0 for built-in network interfaces and 1 for interfaces on uplink modules. For EX8208 and EX8216 switches, it is 0.

lcc ***number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, control the PIC in a specified T640 router that is connected to the TX Matrix router. On a TX Matrix Plus router, control the PIC in a specified T1600 router that is connected to the TX Matrix Plus router. Replace ***number*** with a value from 0 through 3.

Required Privilege Level maintenance

Related Documentation

- show chassis hardware on page 878
- show chassis pic on page 996
- Configuring the PIC Type
- 100-Gigabit Ethernet PIC Overview

List of Sample Output request chassis pic on page 405

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 redundancy feb slot

Syntax request chassis redundancy feb slot *slot-number* (switch-to-backup | revert-from-backup)

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 ***slot-number***—FEB slot number. Replace ***slot-number*** with a value from **0** through **5**.

switch-to-backup—Initiate a switchover from the specified active FEB to the backup FEB for the redundancy group.

revert-from-backup—Initiate a revert to the specified FEB following a switchover to the backup FEB for a redundancy group.

Required Privilege Level maintenance

Related Documentation

- show chassis redundancy feb on page 1025
- Configuring FEB Redundancy on the M120 Router
- Switching Control Board Redundancy

List of Sample Output
request chassis redundancy feb slot 2 switch-to-backup on page 406
request chassis redundancy feb slot 3 revert-to-backup on page 406

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

Syntax

request chassis routing-engine master (acquire | release | switch)
<force>
<no-confirm>

Syntax (TX Matrix Routers)

request chassis routing-engine master (acquire | release | switch) (lcc *number* |
scc | all-chassis)
<force>
<no-confirm>

Syntax (TX Matrix Plus Routers)

request chassis routing-engine master (acquire | release | switch) (lcc *number* |
sfc | all-chassis | all-lcc)
<force>
<no-confirm>

Syntax (MX Series Routers)

request chassis routing-engine master (acquire | release | switch)
<all-members>
<force>
<local>
<member *member-id*>
<no-confirm>

Syntax (MX2010 3D Universal Edge Routers)

request chassis routing-engine master (acquire | release | switch <check>)
<no-confirm>

Syntax (MX2020 3D Universal Edge Routers)

request chassis routing-engine master (acquire | release | switch <check>)
<no-confirm>

Syntax (QFX Series)

request chassis routing-engine master (release | switch)
<check>
<interconnect-device *name*>
<node-group *name*>
<no-confirm>

Release Information

Command introduced before Junos OS Release 7.4.
all-chassis option added in Junos OS Release 8.0.
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 11.3 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

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 T640 routers (in a routing matrix based on the TX Matrix router) or T1600 routers (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 Configuration Guide.

NOTE: Successive graceful Routing Engine switchover events must be a minimum of 240 seconds (4 minutes) apart after both Routing Engines have come up.

If the router or switch displays a warning message similar to "Standby Routing Engine is not ready for graceful switchover. Packet Forwarding Engines that are not ready for graceful switchover might be reset," do not attempt switchover. If you choose to proceed with switchover, only the Packet Forwarding Engines that were not ready for graceful switchover are reset. None of the Flexible PIC concentrators (FPCs) should spontaneously restart. We recommend that you wait until the warning no longer appears and then proceed with the switchover.

You will receive an error message stating "Command aborted. Not ready for mastership switch, try after n seconds" when this command is re-entered before 240 seconds have elapsed on EX Series switches.

NOTE: On a QFabric system, to avoid traffic loss on the network Node group, switch mastership of the routing engine to the backup routing engine, and then reboot.

Options **acquire**—Attempt to become the master Routing Engine.

release—Request that the other Routing Engine become the master.

switch—Toggle mastership between Routing Engines.

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 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, MX240, MX480, MX960, MX2010, and MX2020 Routers only) (Optional) Available only with the **switch** option. 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 and TX Matrix Plus routers only) On a TX Matrix router, the T640 router (or LCC) that is connected to the TX Matrix router (or switch-card chassis). On a TX Matrix Plus router, the T1600 router (or LCC) that is connected to the TX Matrix Plus router (or switch-fabric chassis). Replace ***number*** with a value from 0 through 3.

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 (or switch-card chassis).

sfc—(TX Matrix Plus routers only) TX Matrix Plus router (or switch-fabric chassis).

force—(Optional) Available only with the acquire option. Force the change to a new master Routing Engine.

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 System Basics Configuration Guide

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 1028
- 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 410
request chassis routing-engine master switch on page 410

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 scg

Syntax request chassis scg (offline | online) slot *slot-number*

Syntax (TX Matrix and TX Matrix Plus Routers) request chassis scg lcc *number* (offline | online) slot *slot-number*

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

lcc *number*—(TX Matrix and TX Matrix Plus routers only) On a TX Matrix Plus router, change the SCG status on a specified T640 router (or line-card chassis [LCC]) that is connected to the TX Matrix router. On a TX Matrix Plus router, change the SCG status on a specified T1600 router (or LCC) that is connected to a TX Matrix Plus router. Replace ***number*** with a value from 0 through 3.

offline—Take the SCG offline. When you change the SCG status to offline, the unit is not powered down.

online—Bring the SCG online.

slot *slot-number*—SCG slot number. Replace ***slot-number*** with 0 or 1.

Required Privilege Level maintenance

Related Documentation

- show chassis environment scg on page 599
- Configuring the Clock Source
- T320 SONET Clock Generator (SCG) Description

List of Sample Output request chassis scg on page 411

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 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

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 Junos OS System Basics Configuration Guide.

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.

Required Privilege Level

maintenance

Related Documentation

- show chassis sfm on page 1052
- Switching the Global Master and Backup Roles in a Virtual Chassis Configuration

List of Sample Output

request chassis sfm master switch on page 412
request chassis sfm master switch no-confirm on page 412

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 request chassis sfm (offline | online | restart) slot *slot-number*

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 **offline**—Take the SFM offline.

online—Bring the SFM online.

restart—Restart the SFM.

slot ***slot-number***—SFM slot number. Replace ***slot-number*** with a value from **0** through **3**.

Required Privilege Level maintenance

Related Documentation

- show chassis sfm on page 1052
- Configuring SFM Redundancy on M40e and M160 Routers
- M40e Switching and Forwarding Module (SFM) Description

List of Sample Output request chassis sfm (M40e) on page 413
request chassis sfm (M160) on page 413

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

Syntax

request chassis sib (offline | online) slot *slot-number*

Syntax (TX Matrix Router)

request chassis sib (all-chassis | lcc *number* | scc) (offline | online) slot *slot-number* (start-receiver *number* | stop-receiver *number*)

Syntax (TX Matrix Plus Router)

request chassis sib (all-lcc | f13 *slot-number* | f2s *sib-slot/sib-f2s-slot-number* |lcc *number* | (offline | online) slot *slot-number*)

Release Information

Command introduced before Junos OS Release 7.4.
f13 and **f2s** options for the TX Matrix Plus router introduced in Junos OS Release 9.6.

Description

(M320 routers and T Series routers only) Control the operation of the specified Switch Interface Board (SIB).

Options

all-chassis—(TX Matrix routers only) Control the status of the specified SIB.

all-lcc—(TX Matrix Plus routers only) Control the operation of the SIB on all T1600 routers connected to the TX Matrix Plus router.

f13 ***slot-number***—Control the operation of F13 SIBs. Replace ***slot-number*** with a value **0**, **1**, **3**, **4**, **6**, **7**, **8**, **9**, **11**, or **12**.

f2s ***sib-slot/sib-f2s-slot-number***—(TX Matrix Plus routers only) (Optional) Control the operation of the SIB F2s. 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***—(TX Matrix and TX Matrix Plus routers only) On a TX Matrix router, the T640 router (or line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, the T1600 router (or line-card chassis) and TX Matrix Plus that is connected to the TX Matrix Plus router. Replace ***number*** with a value from 0 through 3.

scc—(TX Matrix router only) TX Matrix router (or switch-card chassis) on a routing matrix.

offline—Take the SIB offline.

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 1055**
- **show chassis environment sib on page 619**
- Configuring the Junos OS to Upgrade and Downgrade Switch Interface Boards on a TX Matrix Router on page 58
- M320 SIB Description

List of Sample Output

request chassis sib on page 415
request chassis sib on page 415

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

Syntax request chassis sib f13 train-link-receive slot *SFC-SIB-F13–slot-num*

Syntax (TX Matrix Plus Routing) request chassis sib f13 train-link-receive slot *SFC-SIB-F13-slot-num*

Release Information Command introduced in Junos OS Release 10.1.

Description (TX Matrix Plus routing platform only) Control the receiving link of the specified Switch Interface Board (SIB) of the SFC.

Options **slot** ***SFC-SIB-F13-slot-num***— SFC SIB slot number. Replace it with 0, 3, 6, 8 or 11.

Required Privilege Level maintenance

Related Documentation

- **request chassis sib f13 train-link-transmit slot on page 417**
- Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 75

List of Sample Output **request chassis sib f13 train-link-receive slot on page 416**

Output Fields When you enter this command, the SFC is ready to receive traffic from the T1600 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 request chassis sib f13 train-link-transmit slot *SFC-SIB-F13-slot-num*

Release Information Command introduced in Junos OS Release 10.1.

Description (TX Matrix Plus routing platform only) Control the transmission link of the specified Switch Interface Board (SIB) of the SFC.

Options **slot** ***SFC-SIB-F13-slot-num***—SFC SIB slot number. Replace it with 0, 3, 6, 8 or 11.

Required Privilege Level maintenance

Related Documentation

- **request chassis sib f13 train-link-receive slot on page 416**
- Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 75

List of Sample Output **request chassis sib f13 train-link-transmit slot on page 417**

Output Fields When you enter this command, the SFC is ready to transmit traffic to the T1600 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 train-link-receive slot

Syntax request chassis sib train-link-receive slot *LCC-SIB-ST-SIB-L-slot-num*

Release Information Command introduced in Junos OS Release 10.1.

Description (T1600 Router [LCC] and TX Matrix Plus routing platform only) Control the receiving link of the specified Switch Interface Board (SIB) of the LCC.

Options **slot** ***LCC-SIB-ST-SIB-L-slot-num***— LCC SIB slot number. Replace it with a value from 0 through 4.

Required Privilege Level maintenance

Related Documentation

- **request chassis sib train-link-transmit slot on page 419**
- Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 75

List of Sample Output **request chassis sib train-link-receive slot on page 418**

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

Syntax request chassis sib train-link-transmit slot *LCC-SIB-ST-SIB-L-slot-num*

Syntax (TX Matrix Plus Routing Platform) request chassis sib train-link-receive slot *LCC-SIB-ST-SIB-L-slot-num*

Release Information Command introduced in Junos OS Release 10.1.

Description (T1600 Router (LCC) and TX Matrix Plus routing platform only) Control the transmission link of the specified Switch Interface Board (SIB) of the LCC.

Options **slot** ***LCC-SIB-ST-SIB-L-slot-num***— LCC SIB slot number. Replace it with a value from 0 through 4.

Required Privilege Level maintenance

Related Documentation

- **request chassis sib train-link-receive slot on page 418**
- Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 75

List of Sample Output **request chassis sib train-link-transmit slot on page 419**

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

Syntax request chassis spmb restart slot *slot-number*

Syntax (TX Matrix Router) request chassis spmb restart (lcc *number* | scc) slot *slot-number*

Syntax (TX Matrix Plus Router) request chassis spmb restart (lcc *number* | sfc *number*) slot *slot-number*

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.

Description Restart the specified Switch Processor Mezzanine Board (SPMB) on the Control Board (CB).

Options

lcc *number*—(TX Matrix and TX Matrix Plus routers only) On a TX Matrix router, the T640 router (or line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, the T1600 router (or line-card chassis) that is connected to the TX Matrix Plus router. Replace ***number*** with a value from **0** through **3**.

scc—(TX Matrix routers only) TX Matrix router (or switch-card chassis) in the routing matrix.

sfc—(TX Matrix Plus routers only) TX Matrix Plus router (or switch-fabric chassis) in the routing matrix.

slot *slot-number*—CB slot number. Replace ***slot-number*** with **0** or **1**.

Required Privilege Level maintenance

Related Documentation

- show chassis spmb on page 1063
- show chassis spmb sibs on page 1072

List of Sample Output

request chassis spmb restart on page 420
request chassis spmb restart (MX2010 Router) on page 420

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 switch

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-0-10mhz | gps-0-5mhz | gps-1-10mhz | gps-1-5mhz)

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 Switches.

Description

(M320, M40e, M120, T320, T640, and T1600 routers and PTX Packet Transport Switches only) Change the external clock source used for chassis synchronization.

Options

external-a—(Routing matrix only) Change the synchronization source to external source A.

external-b—(Routing matrix only) Change the synchronization source to external source B.

bits-a—(PTX Series only) Change the synchronization source to the BITS external source A.

bits-b—(PTX Series only) Change the synchronization source to the BITS external source B.

fpc-*slot-number*—(PTX Series only) Change the synchronization source to an FPC in the slot specified. For the PTX5000 Packet Transport Switch, replace *slot-number* with a value from **0** through**7**.

gps-0-10mhz—(PTX Series only) Change the synchronization source to the 10 MHz GPS source on CCG port 0.

gps-0-5mhz—(PTX Series only) Change the synchronization source to the 5 MHz GPS source on CCG port 0.

gps-1-10mhz—(PTX Series only) Change the synchronization source to the 10 MHz GPS source on CCG port 1.

gps-1-5mhz—(PTX Series only) Change the synchronization source to the 5 Hz GPS source on CCG port 1.

Required Privilege Level

maintenance

Related Documentation

- show chassis synchronization on page 1077
- Configuring Clock Synchronization Interface for MX Series Routers on page 145
- Supported Time Synchronization Standard

List of Sample Output

request chassis synchronization switch (M Series, T Series) on page 422
request chassis synchronization switch (PTX Series) on page 422

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

Syntax

set chassis display message "*message*"
<permanent>

Syntax (TX Matrix Router)

set chassis display message "*message*" (lcc *number* | scc)
<permanent>

Syntax (TX Matrix Plus Router)

set chassis display message "*message* " (fpc-slot *slot-number* | lcc *number* | sfc *number*)
<permanent>

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 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**.

lcc *number* —(TX Matrix and TX Matrix Plus routers only) On a TX Matrix router, display the text message on the craft interface display of a specified T640 router (or line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display the text message on the craft interface display of a specified T1600 router (or line-card chassis) that is connected to the TX Matrix Plus router. Replace ***number*** with a value from **0** through **3**.

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 (or 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 380
- show chassis craft-interface
- Understanding the Implementation of System Log Messages on the QFabric System

List of Sample Output

set chassis display message (Creating) on page 425
set chassis display message (Deleting) on page 425

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

Syntax
show chassis adc

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.

Description
Display chassis information about the adapter cards (ADCs).

Options
none—Display information about all adapter cards.

Required Privilege Level
view

Related Documentation
- show chassis environment adc on page 498

List of Sample Output
show chassis adc (MX2020 Router) on page 429
show chassis adc (MX2010 Router) on page 429

Output Fields
Table 27 on page 428 lists the output fields for the **show chassis adc** command. Output fields are listed in the approximate order in which they appear.

Table 27: show chassis adc Output Fields

Field Name	Field Description
Slot	Slot number.
State	Status of the adapter card. • **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 alarms

Syntax
show chassis alarms

Syntax (TX Matrix Routers)
show chassis alarms
<lcc *number* | scc>

Syntax (TX Matrix Plus Routers)
show chassis alarms
<lcc *number* | sfc *number*>

Syntax (MX Series Routers)
show chassis alarms
<all-members>
<local>
<member *member-id*>

Syntax (MX2010 3D Universal Edge Routers)
show chassis alarms

Syntax (MX2020 3D Universal Edge Routers)
show chassis alarms

Syntax (QFX Series)
show chassis alarms
<interconnect-device *name*>
<node-device *name*>

Syntax (PTX Series Packet Transport Switches)
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 Switches.
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.

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 and TX Matrix Plus routers only) (Optional) On the TX Matrix router, show information about a specified T640 router (or line-card chassis) that is connected to the TX Matrix router. On the TX Matrix Plus router, show information about a specified T1600 router (or line-card chassis) that is connected to the TX Matrix Plus router. Replace ***number*** with a value from **0** through **3**.

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*** with a value of 0 or 1.

node-device ***name***—(QFabric systems only) (Optional) Display information about alarm conditions for the Node device.

scc—(TX Matrix router only) (Optional) Show information about the TX Matrix router (or switch-card chassis).

sfc ***number***—(TX Matrix Plus router only) (Optional) Show information about the TX Matrix Plus router (or switch-fabric chassis). Replace ***number*** 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 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)

As per the above table, 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_ILLEGALSIZE_ERR	4
CMALARM_LCHIP_LOUT_HDRF_TOERR_ERR	5
CMALARM_LCHIP_LOUT_HDRF_PARITY_ERR	6
CMALARM_LCHIP_LOUT_HDRF_UCERR_ERR	7
CMALARM_LCHIP_LOUT_NLIF_CRCDROP_ERR	8
CMALARM_LCHIP_LOUT_NLIF_CRCERR_ERR	9
CMALARM_LCHIP_UCODE_TIMEOUT_ERR	10
CMALARM_LCHIP_LIN_SRCTL_ACCT_DROP_ERR	11
CMALARM_LCHIP_LIN_SRCTL_ACCT_ADDR_SIZE_ERR	12

CMALARM_LCHIP_SRAM_PARITY_ERR	13
CMALARM_LCHIP_UCODE_OVFLW_ERR	14
CMALARM_LCHIP_LOUT_HDRF_MTU_ERR	15

Chip Type: M Chip	Code
CMALARM_MCHIP_ECC_UNCORRECT_ERR	128

Chip Type: N Chip	Code
CMALARM_NCHIP_RDDMA_JBUS_TIMEOUT_ERR	256
CMALARM_NCHIP_RDDMA_FIFO_OVFLW_ERR	257
CMALARM_NCHIP_RDDMA_FIFO_UNFLW_ERR	258
CMALARM_NCHIP_RDDMA_SIZE_ERR	259
CMALARM_NCHIP_RDDMA_JBUS_CRC_ERR	260
CMALARM_NCHIP_WRDMA_PKTR_ERR	261
CMALARM_NCHIP_WRDMA_PKT_CRC_ERR	262
CMALARM_NCHIP_WRDMA_JBUS_TIMEOUT_ERR	263
CMALARM_NCHIP_WRDMA_FIFO_OVFLW_ERR	264
CMALARM_NCHIP_WRDMA_FIFO_UNFLW_ERR	265
CMALARM_NCHIP_WRDMA_PKT_LEN_ERR	266
CMALARM_NCHIP_WRDMA_JBUS_CRC_ERR	267
CMALARM_NCHIP_PKTR_DMA_AGE_ERR	268
CMALARM_NCHIP_PKTR_ICELLSIG_ERR	269
CMALARM_NCHIP_PKTR_FTTL_ERR	270
CMALARM_NCHIP_RODR_OFFSET_OVFLW_ERR	271
CMALARM_NCHIP_PKTR_TMO_CELL_ERR	272
CMALARM_NCHIP_PKTR_TMO_OUTRANGE_ERR	273
CMALARM_NCHIP_PKTR_MD_REQUEST_Q_OVFLW_ERR	274

CMALARM_NCHIP_PKTR_DMA_BUFFER_OVFLW_ERR	275
CMALARM_NCHIP_PKTR_GRT_OVFLW_ERR	276
CMALARM_NCHIP_FRQ_ERR	277
CMALARM_NCHIP_RODR_IN_Q_OVFLW_ERR	278
CMALARM_NCHIP_DBUF_CRC_ERR	279

Chip Type: R Chip	Code
CMALARM_RCHIP_SRAM_PARITY_ERR	512

Chip Type: R Chip	Code
CMALARM_ICHIP_WO_DESRD_ID_ERR	601
CMALARM_ICHIP_WO_DESRD_DATA_ERR	602
CMALARM_ICHIP_WO_DESRD_OFLOW_ERR	603
CMALARM_ICHIP_WO_HDRF_UCERR_ERR	604
CMALARM_ICHIP_WO_HDRF_MTUERR_ERR	605
CMALARM_ICHIP_WO_HDRF_PARITY_ERR	606
CMALARM_ICHIP_WO_HDRF_TOERR_ERR	607
CMALARM_ICHIP_WO_IP_CRC_ERR	608
CMALARM_ICHIP_WO_IP_INTER_ERR	609
CMALARM_ICHIP_WI_WAN_TIMEOUT_ERR	625
CMALARM_ICHIP_WI_FAB_TIMEOUT_ERR	626
CMALARM_ICHIP_RLDRAM_BIST_ERR	630
CMALARM_ICHIP_SDRAM_BIST_ERR	631
CMALARM_ICHIP_RLDRAM_PARITY_ERR	632
CMALARM_ICHIP_SDRAM_UNCORRECT_ERR	633
CMALARM_ICHIP_SDRAM_CORRECT_ERR	634
CMALARM_ICHIP_FUSE_DONE_ERR	635

According to the table above, the **279** error code corresponds to **CMALARM_NCHIP_DBUF_CRC_ERR**; this means that new CRC errors were seen on the NCHIP of this particular FPC, which is FPC as per the logs.

If you do not want to convert decimal to binary and vice-versa, you may use the following shortcut:

For major alarms, the **Actual Error Code = (Error Code - 1)/2**, where **Error Code** is the code that you get in the log message. For example, if you get the following log:

```
Apr 12 08:04:10 send: red alarm set, device FPC 6, reason FPC 6 Major Errors - Error
code: 257
```

Actual Error Code = (257-1)/2 = 128. Similarly, for minor alarms, Actual Error Code = (Error Code)/2

Required Privilege Level view

Related Documentation

- Configuring an Alarm Entry and Its Attributes
- Chassis Conditions That Trigger Alarms on page 211

List of Sample Output

Output Fields Table 28 on page 436 lists the output fields for the **show chassis alarms** command. Output fields are listed in the approximate order in which they appear.

Table 28: 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 (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 (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 (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

```
user@host> show chassis alarms
10 alarms currently active
Alarm time               Class  Description
```


Destinations Present on a T Series Router)

```
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

```
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
```

Destinations on a T Series Router)

```
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 (Alarms on a T4000 Router After the

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 are online while the remaining FPCs are offline, and FPC misconfiguration alarms are generated. The **show chassis alarm** command output displays

enhanced-mode Statement is Enabled)

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 (Alarms Active on the QFX Series)

```
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

```
user@switch> show chassis alarms node-device ED3691
node-device ED3694
3 alarms currently active
```


Active on the QFabric System)

```
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

```
user@switch> show chassis alarms

23 alarms currently active
```

PTX5000 Packet Transport Switch)

```
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 (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 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

- request chassis cfeb on page 385
- Configuring CFEB Redundancy on the M10i Router
- CFEB Overview

List of Sample Output

show chassis cfeb (M7i) on page 444
show chassis cfeb (M10i) on page 444

Output Fields Table 29 on page 443 lists the output fields for the **show chassis cfeb** command. Output fields are listed in the approximate order in which they appear.

Table 29: show chassis cfeb Output Fields

Field Name	Field Description
State	Status of the CFEB: • **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 29: show chassis cfeb 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 cfeb (M7i)

```
user@host> show chassis cfeb
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 cfeb (M10i)

```
user@host> show chassis cfeb
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

- request chassis cip on page 386
- Installing a T1600 CIP
- Installing a T640 CIP
- Installing a TX-CIP
- Installing an M320 CIP
- Installing an M320 CIP
- Installing the T1600 CIP
- Installing the T320 CIP
- CIP Overview

Output Fields

Table 30 on page 445 lists the output fields for the **show chassis cip** command. Output fields are listed in the approximate order in which they appear.

Table 30: 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	Physical port number of the Ethernet switch: • 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. NOTE: The current configuration of the routing matrix based on a TX Matrix Plus router supports only one SFC. • Port numbers **0** to **15** on Ethernet switch **1** can be used to connect up to 16 LCCs. NOTE: The current configuration of a routing matrix based on a TX Matrix Plus router supports only up to four LCCs. You can connect the four LCCs to any of the ports (**o** to **15)** on the Ethernet switch **1**.

Table 30: show chassis cip Output Fields *(continued)*

Field Name	Field Description
Type	Type of CIP: • **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 environment

Syntax

show chassis environment

Syntax (T320, T640, T1600, and T4000 Routers)

show chassis environment
<cb *cb-slot-number*>
<fpc *fpc-slot-number*>
<fpm>
<pem *pem-slot-number*>
<routing-engine *re-slot-number*>
<scg *scg-slot-number*>
<sib *sib-slot-number*>

Syntax (TX Matrix Routers)

show chassis environment
<lcc *number* | scc>

Syntax (TX Matrix Plus Routers)

show chassis environment
<lcc *number* | sfc *number*>

Syntax (MX Series Routers)

show chassis environment
<all-members>
<local>
<member *member-id*>

Syntax (MX2020 3D Universal Edge Routers)

show chassis environment
<adc *adc-slot-number*>
<cb *cb-slot-number*>
<fpc *fpc-slot-number*>
<fpm>
<monitored>
<psm *psm-slot-number*>
<routing-engine *re-slot-number*>
<sfb *sfb-slot-number*>

Syntax (MX2010 3D Universal Edge Routers)

show chassis environment
<adc *adc-slot-number*>
<cb *cb-slot-number*>
<fpc *fpc-slot-number*>
<fpm>
<monitored>
<psm *psm-slot-number*>
<routing-engine *re-slot-number*>
<sfb *sfb-slot-number*>

Syntax (EX Series Switch)

show chassis environment
<all-members>
<cb *cb-slot-number*>
<fpc *fpc-slot-number*>
<local>
<member *member-id*>
<routing-engine *re-slot-number*>

Syntax (EX Series Switch)

show chassis environment
<all-members>
<cb *cb-slot-number*>
<fpc *fpc-slot-number*>
<local>
<member *member-id*>
<power-supply-unit *psu-slot-number*>
<routing-engine *slot-number*>

Syntax (QFX Series)

show chassis environment
<cb *slot-number* <interconnect-device *name*>>
<fpc *slot-number* <interconnect-device *name*>>
<interconnect-device *name* <*slot-number*>
<node-device *name*>
<pem *slot-number* (interconnect-device *name slot-number*) | (node-device *name*)>
<routing-engine *name* <interconnect-device *name slot-number*>>

Syntax (PTX Series Packet Transport Switches)

show chassis environment
<cb *cb-slot-number*>
<ccg *ccg-slot-number* >
<fpc *fpc-slot-number*>
<fpm>
<monitored>
<pdu *pdu-slot-number*>
<routing-engine *re-slot-number*>
<sib *sib-slot-number*>

Syntax (ACX Series Universal Access Routers)

show chassis environment
<cb *cb-slot-number*>
<pem *pem-slot-number*>
<routing-engine *re-slot-number*>

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 QFX Series.
Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Switches.
monitored option added in Junos OS Release 12.1 for PTX Series Packet Transport Switches.
Command introduced in Junos OS Release 12.1 for T4000 Core Routers.
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.
pem option introduced in Junos OS Release 12.3 for ACX4000 Universal Access Routers.

Description

Display environmental information about the router or switch chassis, including the temperature and information about the fans, power supplies, and Routing Engine.

In addition on ACX4000 routers, display temperature information about the different channels of a Modular Interface Card (MIC). The number of channels displayed depends on the type of MIC installed.

Options

none—Display environmental information about the router or switch chassis. On a TX Matrix router, display environmental information about the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display environmental information about the TX Matrix Plus router and its attached T1600 routers.

all-members—(MX Series routers and EX Series switches only) (Optional) Display chassis environmental information for all the members of the Virtual Chassis configuration.

adc ***adc-slot-number***—(MX2020 and MX2010 routers only) (Optional) Display chassis environmental information for the adapter cards. For MX2020 routers, replace ***adc-slot-number*** with a value from **0** through **19**. For MX2010 routers, replace ***adc-slot-number*** with a value from **0** through **9**.

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 Switches, QFX Series, and T Series 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.

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**.

fpc ***fpc-slot***—(EX Series switches, M120, M320, and M40e routers, MX Series routers, MX2010 routers, MX2020 routers, PTX Series Packet Transport Switches, QFX Series, QFX3500 switches, QFabric systems, and T Series 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.

fpm—(M120, M320, and M40e routers, MX2010 routers, MX2020 routers, PTX Series, Packet Transport Switches, and T Series 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.

monitored—(MX2020 routers and PTX Series Packet Transport Switches only) (Optional) Display chassis environmental information for monitored temperatures only. Temperatures that are not included in temperature alarm computations are not displayed.

lcc ***number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display chassis environmental 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 chassis environmental information for a specified T1600 router (or line-card chassis) that is connected to the TX Matrix Plus router. Replace ***number*** with a value from **0** through **3**.

local—(MX Series routers and EX Series switches) (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.

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, 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.

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 (or 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 TX Matrix Plus router (or switch-fabric chassis). Replace ***number*** with **0**.

sib *sib-slot-number*—(M320 routers, PTX Series Packet Transport Switches, 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 498
- show chassis environment cb on page 509
- show chassis environment ccg
- show chassis environment cip
- show chassis environment fpc on page 527
- show chassis environment fpm on page 555
- show chassis environment mcs on page 576
- show chassis environment monitored on page 562
- show chassis environment pcg on page 578
- show chassis environment pdu
- show chassis environment pem on page 580
- show chassis environment psm on page 589
- show chassis environment psu
- show chassis environment routing-engine on page 594
- show chassis environment scg on page 599
- show chassis environment sfb on page 605
- show chassis environment sib on page 619

List of Sample Output

show chassis environment (J2300 Router) on page 455
show chassis environment (J4300 or J6300 Router) on page 455
show chassis environment (M5 Router) on page 455
show chassis environment (M7i Router) on page 455
show chassis environment (M10 Router) on page 455

Output Fields

Table 31 on page 453 lists the output fields for the **show chassis environment** command. Output fields are listed in the approximate order in which they appear.

Table 31: show chassis environment Output Fields

<table>
<tr><th>Field Name</th><th>Field Description</th></tr>
<tr><td>Class</td><td>Information about the category or class of chassis component:

Power: Power information:

(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).
On PTX Series Packet Transport Switches 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.
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 Switches 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.

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 Switches, 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.

</td></tr>
<tr><td>Item</td><td>(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).</td></tr>
<tr><td>Status</td><td>(MX2010 and MX2020 Routers) Status of the specified chassis component. For example, if the Class is Fan, the fan status can be:

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.

If the Class is Power, the power supply status can be:

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.
</td></tr>
</table>

Table 31: show chassis environment Output Fields *(continued)*

Field Name	Field Description
Measurement	(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.

Sample Output

show chassis environment (J2300 Router)

```
user@host> show chassis environment
Class Item                  Status      Measurement
Temp  Routing Engine        OK          40 degrees C / 104 degrees F
Fan   Fan                   OK
```

show chassis environment (J4300 or J6300 Router)

```
user@host> show chassis environment
Class Item                  Status      Measurement
Temp  Routing Engine        OK          41 degrees C / 105 degrees F
Fan   Fan 0                 OK
      Fan 1                 OK
```

show chassis environment (M5 Router)

```
user@host> show chassis environment
Class Item                  Status      Measurement
Power Power Supply A        OK
      Power Supply B        Absent
Temp  FPC 0                 OK          30 degrees C / 86 degrees F
      FEB                   OK          33 degrees C / 91 degrees F
      PS Intake             OK          27 degrees C / 80 degrees F
      PS Exhaust            OK          27 degrees C / 80 degrees F
      Routing Engine        OK          34 degrees C / 93 degrees F
Fans  Left Fan 1            OK          Spinning at normal speed
      Left Fan 2            OK          Spinning at normal speed
      Left Fan 3            OK          Spinning at normal speed
      Left Fan 4            OK          Spinning at normal speed
Misc  Craft Interface       OK
```

show chassis environment (M7i Router)

```
user@host> show chassis environment
Class Item                  Status      Measurement
Power Power Supply 0        OK
      Power Supply 1        Absent
Temp  Intake                OK          22 degrees C / 71 degrees F
      FPC 0                 OK          23 degrees C / 73 degrees F
      Power Supplies        OK          23 degrees C / 73 degrees F
      CFEB Intake           OK          24 degrees C / 75 degrees F
      CFEB Exhaust          OK          29 degrees C / 84 degrees F
      Routing Engine        OK          26 degrees C / 78 degrees F
Fans  Fan 1                 OK          Spinning at normal speed
      Fan 2                 OK          Spinning at normal speed
      Fan 3                 OK          Spinning at normal speed
      Fan 4                 OK          Spinning at normal speed
```

show chassis environment (M10 Router)

```
user@host> show chassis environment
Class Item                  Status      Measurement
Power Power Supply A        OK
      Power Supply B        Failed
Temp  FPC 0                 OK          36 degrees C / 96 degrees F
      FPC 1                 OK          35 degrees C / 95 degrees F
      FEB                   OK          34 degrees C / 93 degrees F
      PS Intake             OK          31 degrees C / 87 degrees F
      PS Exhaust            OK          34 degrees C / 93 degrees F
      Routing Engine        OK          35 degrees C / 95 degrees F
Fans  Left Fan 1            OK          Spinning at normal speed
```

```
      Left Fan 2             OK         Spinning at normal speed
      Left Fan 3             OK         Spinning at normal speed
      Left Fan 4             OK         Spinning at normal speed
Misc  Craft Interface        OK
```

show chassis environment (M10i Router)

```
user@host> show chassis environment
Class Item                   Status     Measurement
Power Power Supply 0         OK
      Power Supply 1         OK
      Power Supply 2         Absent
      Power Supply 3         Absent
Temp  Intake                 OK         26 degrees C / 78 degrees F
      FPC 0                  OK         27 degrees C / 80 degrees F
      FPC 1                  OK         28 degrees C / 82 degrees F
      Lower Power Supplies   OK         29 degrees C / 84 degrees F
      Upper Power Supplies   OK         28 degrees C / 82 degrees F
      CFEB Intake            OK         27 degrees C / 80 degrees F
      CFEB Exhaust           OK         36 degrees C / 96 degrees F
      Routing Engine 0       OK         31 degrees C / 87 degrees F
      Routing Engine 1       OK         27 degrees C / 80 degrees F
Fans  Fan Tray 0 Fan 1       OK         Spinning at normal speed
      Fan Tray 0 Fan 2       OK         Spinning at normal speed
      Fan Tray 0 Fan 3       OK         Spinning at normal speed
      Fan Tray 0 Fan 4       OK         Spinning at normal speed
      Fan Tray 0 Fan 5       OK         Spinning at normal speed
      Fan Tray 0 Fan 6       OK         Spinning at normal speed
      Fan Tray 0 Fan 7       OK         Spinning at normal speed
      Fan Tray 0 Fan 8       OK         Spinning at normal speed
      Fan Tray 1 Fan 1       Absent
      Fan Tray 1 Fan 2       Absent
      Fan Tray 1 Fan 3       Absent
      Fan Tray 1 Fan 4       Absent
      Fan Tray 1 Fan 5       Absent
      Fan Tray 1 Fan 6       Absent
      Fan Tray 1 Fan 7       Absent
      Fan Tray 1 Fan 8       Absent
```

show chassis environment (M20 Router)

```
user@host> show chassis environment
Class Item                   Status     Measurement
Power Power Supply A         OK
      Power Supply B         Absent
Temp  FPC 0                  OK         28 degrees C / 82 degrees F
      FPC 1                  OK         27 degrees C / 80 degrees F
      Power Supply A         OK         22 degrees C / 71 degrees F
      Power Supply B         Absent
      SSB 0                  OK         30 degrees C / 86 degrees F
      Backplane              OK         22 degrees C / 71 degrees F
      Routing Engine 0       OK         26 degrees C / 78 degrees F
      Routing Engine 1       Testing
Fans  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
```

```
user@host> show chassis environment
```


show chassis environment (M40 Router)

```
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 (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

```
user@host> show chassis environment
Class Item                          Status     Measurement
Temp  PEM 0                         OK         40 degrees C / 104 degrees F
```

Router with Enhanced MX SCB)

```
       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

```
user@host> show chassis environment
Class Item                           Status     Measurement
Temp  PEM 0                          OK         35 degrees C / 95 degrees F
```


Router with Enhanced MX SCB)

```
         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

```
user@host> show chassis environment
Class Item                            Status      Measurement
Temp  PEM 0                           Absent
```


Router with Enhanced MX SCB)

```
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 (MX2020 Router)

```
user@host> show chassis environment
Class Item                              Status      Measurement
Temp      PSM 0                         Absent
          PSM 1                         Absent
          PSM 2                         OK          41 degrees C / 105 degrees F
          PSM 3                         OK          39 degrees C / 102 degrees F
          PSM 4                         OK          39 degrees C / 102 degrees F
          PSM 5                         OK          38 degrees C / 100 degrees F
          PSM 6                         OK          38 degrees C / 100 degrees F
          PSM 7                         OK          38 degrees C / 100 degrees F
          PSM 8                         OK          37 degrees C / 98 degrees F
          PSM 9                         Absent
          PSM 10                        Absent
          PSM 11                        OK          47 degrees C / 116 degrees F
          PSM 12                        OK          45 degrees C / 113 degrees F
          PSM 13                        OK          44 degrees C / 111 degrees F
          PSM 14                        OK          44 degrees C / 111 degrees F
          PSM 15                        OK          43 degrees C / 109 degrees F
          PSM 16                        OK          42 degrees C / 107 degrees F
          PSM 17                        OK          41 degrees C / 105 degrees F
          PDM 0                         OK
          PDM 1                         Absent
          PDM 2                         Absent
          PDM 3                         OK
          CB 0 IntakeA-Zone0            OK          45 degrees C / 113 degrees F
          CB 0 IntakeB-Zone1            OK          34 degrees C / 93 degrees F
          CB 0 IntakeC-Zone0            OK          48 degrees C / 118 degrees F
          CB 0 ExhaustA-Zone0           OK          45 degrees C / 113 degrees F
          CB 0 ExhaustB-Zone1           OK          37 degrees C / 98 degrees F
          CB 0 TCBC-Zone0               OK          41 degrees C / 105 degrees F
          CB 1 IntakeA-Zone0            OK          46 degrees C / 114 degrees F
          CB 1 IntakeB-Zone1            OK          42 degrees C / 107 degrees F
          CB 1 IntakeC-Zone0            OK          49 degrees C / 120 degrees F
          CB 1 ExhaustA-Zone0           OK          46 degrees C / 114 degrees F
          CB 1 ExhaustB-Zone1           OK          41 degrees C / 105 degrees F
```



```
CB 1 TCBC-Zone0               OK          46 degrees C / 114 degrees F
SPMB 0 Intake                 OK          33 degrees C / 91 degrees F
SPMB 1 Intake                 OK          42 degrees C / 107 degrees F
Routing Engine 0              OK          35 degrees C / 95 degrees F
Routing Engine 0 CPU          OK          34 degrees C / 93 degrees F
Routing Engine 1              OK          44 degrees C / 111 degrees F
Routing Engine 1 CPU          OK          42 degrees C / 107 degrees F
SFB 0 Intake-Zone0            OK          55 degrees C / 131 degrees F
SFB 0 Exhaust-Zone1           OK          48 degrees C / 118 degrees F
SFB 0 IntakeA-Zone0           OK          50 degrees C / 122 degrees F
SFB 0 IntakeB-Zone1           OK          40 degrees C / 104 degrees F
SFB 0 Exhaust-Zone0           OK          52 degrees C / 125 degrees F
SFB 0 SFB-XF2-Zone1           OK          61 degrees C / 141 degrees F
SFB 0 SFB-XF1-Zone0           OK          69 degrees C / 156 degrees F
SFB 0 SFB-XF0-Zone0           OK          68 degrees C / 154 degrees F
SFB 1 Intake-Zone0            OK          56 degrees C / 132 degrees F
SFB 1 Exhaust-Zone1           OK          47 degrees C / 116 degrees F
SFB 1 IntakeA-Zone0           OK          51 degrees C / 123 degrees F
SFB 1 IntakeB-Zone1           OK          40 degrees C / 104 degrees F
SFB 1 Exhaust-Zone0           OK          51 degrees C / 123 degrees F
SFB 1 SFB-XF2-Zone1           OK          62 degrees C / 143 degrees F
SFB 1 SFB-XF1-Zone0           OK          67 degrees C / 152 degrees F
SFB 1 SFB-XF0-Zone0           OK          69 degrees C / 156 degrees F
SFB 2 Intake-Zone0            OK          56 degrees C / 132 degrees F
SFB 2 Exhaust-Zone1           OK          47 degrees C / 116 degrees F
SFB 2 IntakeA-Zone0           OK          51 degrees C / 123 degrees F
SFB 2 IntakeB-Zone1           OK          40 degrees C / 104 degrees F
SFB 2 Exhaust-Zone0           OK          53 degrees C / 127 degrees F
SFB 2 SFB-XF2-Zone1           OK          65 degrees C / 149 degrees F
SFB 2 SFB-XF1-Zone0           OK          69 degrees C / 156 degrees F
SFB 2 SFB-XF0-Zone0           OK          70 degrees C / 158 degrees F
SFB 3 Intake-Zone0            OK          57 degrees C / 134 degrees F
SFB 3 Exhaust-Zone1           OK          48 degrees C / 118 degrees F
SFB 3 IntakeA-Zone0           OK          52 degrees C / 125 degrees F
SFB 3 IntakeB-Zone1           OK          41 degrees C / 105 degrees F
SFB 3 Exhaust-Zone0           OK          53 degrees C / 127 degrees F
SFB 3 SFB-XF2-Zone1           OK          66 degrees C / 150 degrees F
SFB 3 SFB-XF1-Zone0           OK          69 degrees C / 156 degrees F
SFB 3 SFB-XF0-Zone0           OK          71 degrees C / 159 degrees F
SFB 4 Intake-Zone0            OK          58 degrees C / 136 degrees F
SFB 4 Exhaust-Zone1           OK          49 degrees C / 120 degrees F
SFB 4 IntakeA-Zone0           OK          54 degrees C / 129 degrees F
SFB 4 IntakeB-Zone1           OK          42 degrees C / 107 degrees F
SFB 4 Exhaust-Zone0           OK          53 degrees C / 127 degrees F
SFB 4 SFB-XF2-Zone1           OK          64 degrees C / 147 degrees F
SFB 4 SFB-XF1-Zone0           OK          68 degrees C / 154 degrees F
SFB 4 SFB-XF0-Zone0           OK          71 degrees C / 159 degrees F
SFB 5 Intake-Zone0            OK          58 degrees C / 136 degrees F
SFB 5 Exhaust-Zone1           OK          50 degrees C / 122 degrees F
SFB 5 IntakeA-Zone0           OK          53 degrees C / 127 degrees F
SFB 5 IntakeB-Zone1           OK          43 degrees C / 109 degrees F
SFB 5 Exhaust-Zone0           OK          54 degrees C / 129 degrees F
SFB 5 SFB-XF2-Zone1           OK          66 degrees C / 150 degrees F
SFB 5 SFB-XF1-Zone0           OK          69 degrees C / 156 degrees F
SFB 5 SFB-XF0-Zone0           OK          74 degrees C / 165 degrees F
SFB 6 Intake-Zone0            OK          58 degrees C / 136 degrees F
SFB 6 Exhaust-Zone1           OK          49 degrees C / 120 degrees F
SFB 6 IntakeA-Zone0           OK          53 degrees C / 127 degrees F
SFB 6 IntakeB-Zone1           OK          43 degrees C / 109 degrees F
SFB 6 Exhaust-Zone0           OK          53 degrees C / 127 degrees F
SFB 6 SFB-XF2-Zone1           OK          65 degrees C / 149 degrees F
```



```
SFB 6 SFB-XF1-Zone0          OK          68 degrees C / 154 degrees F
SFB 6 SFB-XF0-Zone0          OK          72 degrees C / 161 degrees F
SFB 7 Intake-Zone0           OK          57 degrees C / 134 degrees F
SFB 7 Exhaust-Zone1          OK          50 degrees C / 122 degrees F
SFB 7 IntakeA-Zone0          OK          53 degrees C / 127 degrees F
SFB 7 IntakeB-Zone1          OK          43 degrees C / 109 degrees F
SFB 7 Exhaust-Zone0          OK          54 degrees C / 129 degrees F
SFB 7 SFB-XF2-Zone1          OK          68 degrees C / 154 degrees F
SFB 7 SFB-XF1-Zone0          OK          69 degrees C / 156 degrees F
SFB 7 SFB-XF0-Zone0          OK          73 degrees C / 163 degrees F
FPC 0 Intake                 OK          41 degrees C / 105 degrees F
FPC 0 Exhaust A              OK          48 degrees C / 118 degrees F
FPC 0 Exhaust B              OK          62 degrees C / 143 degrees F
FPC 0 LU 0 TSen              OK          59 degrees C / 138 degrees F
FPC 0 LU 0 Chip              OK          62 degrees C / 143 degrees F
FPC 0 LU 1 TSen              OK          59 degrees C / 138 degrees F
FPC 0 LU 1 Chip              OK          64 degrees C / 147 degrees F
FPC 0 LU 2 TSen              OK          59 degrees C / 138 degrees F
FPC 0 LU 2 Chip              OK          53 degrees C / 127 degrees F
FPC 0 LU 3 TSen              OK          59 degrees C / 138 degrees F
FPC 0 LU 3 Chip              OK          53 degrees C / 127 degrees F
FPC 0 MQ 0 TSen              OK          47 degrees C / 116 degrees F
FPC 0 MQ 0 Chip              OK          49 degrees C / 120 degrees F
FPC 0 MQ 1 TSen              OK          47 degrees C / 116 degrees F
FPC 0 MQ 1 Chip              OK          51 degrees C / 123 degrees F
FPC 0 MQ 2 TSen              OK          47 degrees C / 116 degrees F
FPC 0 MQ 2 Chip              OK          44 degrees C / 111 degrees F
FPC 0 MQ 3 TSen              OK          47 degrees C / 116 degrees F
FPC 0 MQ 3 Chip              OK          45 degrees C / 113 degrees F
FPC 1 Intake                 OK          40 degrees C / 104 degrees F
FPC 1 Exhaust A              OK          49 degrees C / 120 degrees F
FPC 1 Exhaust B              OK          58 degrees C / 136 degrees F
FPC 1 LU 0 TSen              OK          55 degrees C / 131 degrees F
FPC 1 LU 0 Chip              OK          56 degrees C / 132 degrees F
FPC 1 LU 1 TSen              OK          55 degrees C / 131 degrees F
FPC 1 LU 1 Chip              OK          58 degrees C / 136 degrees F
FPC 1 LU 2 TSen              OK          55 degrees C / 131 degrees F
FPC 1 LU 2 Chip              OK          49 degrees C / 120 degrees F
FPC 1 LU 3 TSen              OK          55 degrees C / 131 degrees F
FPC 1 LU 3 Chip              OK          51 degrees C / 123 degrees F
FPC 1 MQ 0 TSen              OK          47 degrees C / 116 degrees F
FPC 1 MQ 0 Chip              OK          48 degrees C / 118 degrees F
FPC 1 MQ 1 TSen              OK          47 degrees C / 116 degrees F
FPC 1 MQ 1 Chip              OK          50 degrees C / 122 degrees F
FPC 1 MQ 2 TSen              OK          47 degrees C / 116 degrees F
FPC 1 MQ 2 Chip              OK          44 degrees C / 111 degrees F
FPC 1 MQ 3 TSen              OK          47 degrees C / 116 degrees F
FPC 1 MQ 3 Chip              OK          44 degrees C / 111 degrees F
FPC 2 Intake                 OK          39 degrees C / 102 degrees F
FPC 2 Exhaust A              OK          49 degrees C / 120 degrees F
FPC 2 Exhaust B              OK          61 degrees C / 141 degrees F
FPC 2 LU 0 TSen              OK          58 degrees C / 136 degrees F
FPC 2 LU 0 Chip              OK          60 degrees C / 140 degrees F
FPC 2 LU 1 TSen              OK          58 degrees C / 136 degrees F
FPC 2 LU 1 Chip              OK          65 degrees C / 149 degrees F
FPC 2 LU 2 TSen              OK          58 degrees C / 136 degrees F
FPC 2 LU 2 Chip              OK          51 degrees C / 123 degrees F
FPC 2 LU 3 TSen              OK          58 degrees C / 136 degrees F
FPC 2 LU 3 Chip              OK          53 degrees C / 127 degrees F
FPC 2 MQ 0 TSen              OK          47 degrees C / 116 degrees F
FPC 2 MQ 0 Chip              OK          50 degrees C / 122 degrees F
```

```
FPC 2 MQ 1 TSen              OK          47 degrees C / 116 degrees F
FPC 2 MQ 1 Chip              OK          52 degrees C / 125 degrees F
FPC 2 MQ 2 TSen              OK          47 degrees C / 116 degrees F
FPC 2 MQ 2 Chip              OK          45 degrees C / 113 degrees F
FPC 2 MQ 3 TSen              OK          47 degrees C / 116 degrees F
FPC 2 MQ 3 Chip              OK          46 degrees C / 114 degrees F
FPC 3 Intake                 OK          40 degrees C / 104 degrees F
FPC 3 Exhaust A              OK          49 degrees C / 120 degrees F
FPC 3 Exhaust B              OK          61 degrees C / 141 degrees F
FPC 3 LU 0 TSen              OK          58 degrees C / 136 degrees F
FPC 3 LU 0 Chip              OK          61 degrees C / 141 degrees F
FPC 3 LU 1 TSen              OK          58 degrees C / 136 degrees F
FPC 3 LU 1 Chip              OK          62 degrees C / 143 degrees F
FPC 3 LU 2 TSen              OK          58 degrees C / 136 degrees F
FPC 3 LU 2 Chip              OK          51 degrees C / 123 degrees F
FPC 3 LU 3 TSen              OK          58 degrees C / 136 degrees F
FPC 3 LU 3 Chip              OK          53 degrees C / 127 degrees F
FPC 3 MQ 0 TSen              OK          48 degrees C / 118 degrees F
FPC 3 MQ 0 Chip              OK          50 degrees C / 122 degrees F
FPC 3 MQ 1 TSen              OK          48 degrees C / 118 degrees F
FPC 3 MQ 1 Chip              OK          54 degrees C / 129 degrees F
FPC 3 MQ 2 TSen              OK          48 degrees C / 118 degrees F
FPC 3 MQ 2 Chip              OK          45 degrees C / 113 degrees F
FPC 3 MQ 3 TSen              OK          48 degrees C / 118 degrees F
FPC 3 MQ 3 Chip              OK          48 degrees C / 118 degrees F
FPC 4 Intake                 OK          40 degrees C / 104 degrees F
FPC 4 Exhaust A              OK          49 degrees C / 120 degrees F
FPC 4 Exhaust B              OK          62 degrees C / 143 degrees F
FPC 4 LU 0 TSen              OK          59 degrees C / 138 degrees F
FPC 4 LU 0 Chip              OK          62 degrees C / 143 degrees F
FPC 4 LU 1 TSen              OK          59 degrees C / 138 degrees F
FPC 4 LU 1 Chip              OK          65 degrees C / 149 degrees F
FPC 4 LU 2 TSen              OK          59 degrees C / 138 degrees F
FPC 4 LU 2 Chip              OK          51 degrees C / 123 degrees F
FPC 4 LU 3 TSen              OK          59 degrees C / 138 degrees F
FPC 4 LU 3 Chip              OK          53 degrees C / 127 degrees F
FPC 4 MQ 0 TSen              OK          48 degrees C / 118 degrees F
FPC 4 MQ 0 Chip              OK          52 degrees C / 125 degrees F
FPC 4 MQ 1 TSen              OK          48 degrees C / 118 degrees F
FPC 4 MQ 1 Chip              OK          53 degrees C / 127 degrees F
FPC 4 MQ 2 TSen              OK          48 degrees C / 118 degrees F
FPC 4 MQ 2 Chip              OK          46 degrees C / 114 degrees F
FPC 4 MQ 3 TSen              OK          48 degrees C / 118 degrees F
FPC 4 MQ 3 Chip              OK          47 degrees C / 116 degrees F
FPC 5 Intake                 OK          41 degrees C / 105 degrees F
FPC 5 Exhaust A              OK          50 degrees C / 122 degrees F
FPC 5 Exhaust B              OK          63 degrees C / 145 degrees F
FPC 5 LU 0 TSen              OK          60 degrees C / 140 degrees F
FPC 5 LU 0 Chip              OK          63 degrees C / 145 degrees F
FPC 5 LU 1 TSen              OK          60 degrees C / 140 degrees F
FPC 5 LU 1 Chip              OK          66 degrees C / 150 degrees F
FPC 5 LU 2 TSen              OK          60 degrees C / 140 degrees F
FPC 5 LU 2 Chip              OK          56 degrees C / 132 degrees F
FPC 5 LU 3 TSen              OK          60 degrees C / 140 degrees F
FPC 5 LU 3 Chip              OK          54 degrees C / 129 degrees F
FPC 5 MQ 0 TSen              OK          49 degrees C / 120 degrees F
FPC 5 MQ 0 Chip              OK          52 degrees C / 125 degrees F
FPC 5 MQ 1 TSen              OK          49 degrees C / 120 degrees F
FPC 5 MQ 1 Chip              OK          53 degrees C / 127 degrees F
FPC 5 MQ 2 TSen              OK          49 degrees C / 120 degrees F
FPC 5 MQ 2 Chip              OK          48 degrees C / 118 degrees F
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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
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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
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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
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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
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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
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          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 (MX2010 Router)

```
user@host> show chassis environment
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
        Rear Tray Bottom fan          OK         Spinning at high speed
Misc    CIP                           OK
        SPMB 0                        OK
        SPMB 1                        OK
```

show chassis environment (TX Matrix Router)

```
user@host> show chassis environment
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

lcc0-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
      Rear Tray Third fan   OK         Spinning at normal speed
      Rear Tray Fourth fan  OK         Spinning at normal speed
      Rear Tray Fifth fan   OK         Spinning at normal speed
      Rear Tray Sixth fan   OK         Spinning at normal speed
      Rear Tray Seventh fan  OK        Spinning at normal speed
      Rear Tray Bottom fan  OK         Spinning at normal speed
Misc  CIP                   OK
      SPMB 0                OK
      SPMB 1                OK

lcc2-re0:
--------------------------------------------------------------------------
Class Item                  Status     Measurement
Temp  PEM 0                 OK         29 degrees C / 84 degrees F
      PEM 1                 Absent
      SCG 0                 OK         32 degrees C / 89 degrees F
      SCG 1                 Absent
      Routing Engine 0      OK         31 degrees C / 87 degrees F
      Routing Engine 1      OK         32 degrees C / 89 degrees F
      CB 0                  OK         30 degrees C / 86 degrees F
      SIB 0                 OK         38 degrees C / 100 degrees F
      SIB 0 (B)             OK         49 degrees C / 120 degrees F
      FPC 0 Top             OK         45 degrees C / 113 degrees F
      FPC 0 Bottom          OK         33 degrees C / 91 degrees F
      FPC 1 Top             OK         37 degrees C / 98 degrees F
      FPC 1 Bottom          OK         33 degrees C / 91 degrees F
      FPM GBUS              OK         30 degrees C / 86 degrees F
      FPM Display           OK         34 degrees C / 93 degrees F
Fans  Top Left Front fan    OK         Spinning at normal speed
      Top Left Middle fan   OK         Spinning at normal speed
```



```
...
```

show chassis environment (T1600 Router)

```
user@host> show chassis environment
Class Item                           Status     Measurement
Temp  PEM 0                          OK         27 degrees C / 80 degrees F
      PEM 1                          Absent
      SCG 0                          OK         31 degrees C / 87 degrees F
      SCG 1                          OK         35 degrees C / 95 degrees F
      Routing Engine 0               OK         30 degrees C / 86 degrees F
      Routing Engine 1               OK         30 degrees C / 86 degrees F
      CB 0                           OK         31 degrees C / 87 degrees F
      CB 1                           OK         31 degrees C / 87 degrees F
      SIB 0                          OK         41 degrees C / 105 degrees F
      SIB 0 (B)                      OK         34 degrees C / 93 degrees F
      SIB 1                          OK         0 degrees C / 32 degrees F
      SIB 1 (B)                      OK         0 degrees C / 32 degrees F
      SIB 2                          OK         0 degrees C / 32 degrees F
      SIB 2 (B)                      OK         0 degrees C / 32 degrees F
      SIB 3                          OK         0 degrees C / 32 degrees F
      SIB 3 (B)                      OK         0 degrees C / 32 degrees F
      SIB 4                          OK         0 degrees C / 32 degrees F
      SIB 4 (B)                      OK         0 degrees C / 32 degrees F
      FPC 0 Top                      OK         49 degrees C / 120 degrees F
      FPC 0 Bottom                   OK         50 degrees C / 122 degrees F
      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 (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
```

```
user@switch> show chassis environment
```


show chassis environment (QFX Series)

```
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 Mgmnt 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

```
user@switch> show chassis environment interconnect-device IC-A0004
Class Item                           Status     Measurement
      CB 0
```

interconnect-device (QFabric System)

```
          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

```
user@switch> show chassis environment node-device node1
Class Item                         Status     Measurement
Power node1 Power Supply 0          Absent
```

node-device (QFabric System)

```
      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

```
user@switch> show chassis environment
Class Item                           Status     Measurement
Temp  PDU 0                          OK
```


(PTX5000 Packet Transport Switch)

```
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 Intake                OK          39 degrees C / 102 degrees F
SIB 0 Exhaust               OK          37 degrees C / 98 degrees F
SIB 0 Junction              OK          43 degrees C / 109 degrees F
SIB 1 Intake                OK          39 degrees C / 102 degrees F
SIB 1 Exhaust               OK          36 degrees C / 96 degrees F
SIB 1 Junction              OK          46 degrees C / 114 degrees F
SIB 2 Intake                OK          37 degrees C / 98 degrees F
SIB 2 Exhaust               OK          37 degrees C / 98 degrees F
SIB 2 Junction              OK          42 degrees C / 107 degrees F
SIB 3 Intake                OK          40 degrees C / 104 degrees F
SIB 3 Exhaust               OK          40 degrees C / 104 degrees F
SIB 3 Junction              OK          45 degrees C / 113 degrees F
SIB 4 Intake                OK          47 degrees C / 116 degrees F
SIB 4 Exhaust               OK          44 degrees C / 111 degrees F
SIB 4 Junction              OK          58 degrees C / 136 degrees F
SIB 5 Intake                OK          58 degrees C / 136 degrees F
SIB 5 Exhaust               OK          43 degrees C / 109 degrees F
SIB 5 Junction              OK          71 degrees C / 159 degrees F
SIB 6 Intake                OK          57 degrees C / 134 degrees F
SIB 6 Exhaust               OK          42 degrees C / 107 degrees F
SIB 6 Junction              OK          65 degrees C / 149 degrees F
SIB 7 Intake                OK          58 degrees C / 136 degrees F
SIB 7 Exhaust               OK          42 degrees C / 107 degrees F
SIB 7 Junction              OK          66 degrees C / 150 degrees F
SIB 8 Intake                OK          57 degrees C / 134 degrees F
SIB 8 Exhaust               OK          42 degrees C / 107 degrees F
SIB 8 Junction              OK          70 degrees C / 158 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 (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 adc

Syntax

show chassis environment adc
<*adc-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.

Description

Display chassis environmental information about the adapter cards.

Options

none—Display environmental information about all adapter cards.

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**.

Required Privilege Level

view

Related Documentation

- show chassis adc on page 428

List of Sample Output

show chassis environment adc (MX2020 Router) on page 499
show chassis environment adc (MX2010 Router) on page 505

Output Fields

Table 32 on page 498 lists the output fields for the **show chassis environment adc** command. Output fields are listed in the approximate order in which they appear.

Table 32: show chassis environment adc Output Fields

Field Name	Field Description
State	Status of the adapter card. • **Online**—The adapter card is online and running. • **Offline**—Adapter card is powered down.
Temperature	Temperature in Celsius (C) and Fahrenheit (F) of the air flowing past the adapter card. • **Temperature Intake**—Measures the temperature of the air intake. • **Temperature Exhaust**—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	Power required and measured on the adapter card. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.

Sample Output

show chassis environment adc (MX2020 Router)

```
user@host> show chassis environment adc
ADC 0 status:
  State                       Online
  Intake Temperature          39 degrees C / 102 degrees F
  Exhaust Temperature         50 degrees C / 122 degrees F
  ADC-XF1 Temperature         58 degrees C / 136 degrees F
  ADC-XF0 Temperature         64 degrees C / 147 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL      1029 mV
    LTC3880-XF0-1.0v-CH0       1029 mV
    LTC3880-XF0-1.0v-CH1       1033 mV
    LTC3880-XF0-1.5v-RAIL      1499 mV
    LTC3880-XF0-1.5v-CH0       1499 mV
    LTC3880-XF0-1.5v-CH1       1501 mV
    LTC3880-XF1-1.0v-RAIL      1029 mV
    LTC3880-XF1-1.0v-CH0       1029 mV
    LTC3880-XF1-1.0v-CH1       1033 mV
    LTC3880-XF1-1.5v-RAIL      1499 mV
    LTC3880-XF1-1.5v-CH0       1499 mV
    LTC3880-XF1-1.5v-CH1       1502 mV
ADC 1 status:
  State                       Online
  Intake Temperature          38 degrees C / 100 degrees F
  Exhaust Temperature         48 degrees C / 118 degrees F
  ADC-XF1 Temperature         59 degrees C / 138 degrees F
  ADC-XF0 Temperature         61 degrees C / 141 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL      1029 mV
    LTC3880-XF0-1.0v-CH0       1029 mV
    LTC3880-XF0-1.0v-CH1       1033 mV
    LTC3880-XF0-1.5v-RAIL      1500 mV
    LTC3880-XF0-1.5v-CH0       1500 mV
    LTC3880-XF0-1.5v-CH1       1501 mV
    LTC3880-XF1-1.0v-RAIL      1029 mV
    LTC3880-XF1-1.0v-CH0       1029 mV
    LTC3880-XF1-1.0v-CH1       1033 mV
    LTC3880-XF1-1.5v-RAIL      1500 mV
    LTC3880-XF1-1.5v-CH0       1500 mV
    LTC3880-XF1-1.5v-CH1       1502 mV
ADC 2 status:
  State                       Online
  Intake Temperature          36 degrees C / 96 degrees F
  Exhaust Temperature         50 degrees C / 122 degrees F
  ADC-XF1 Temperature         52 degrees C / 125 degrees F
  ADC-XF0 Temperature         59 degrees C / 138 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL      1030 mV
    LTC3880-XF0-1.0v-CH0       1030 mV
    LTC3880-XF0-1.0v-CH1       1033 mV
    LTC3880-XF0-1.5v-CH0       1499 mV
    LTC3880-XF1-1.0v-RAIL      1029 mV
    LTC3880-XF1-1.0v-CH0       1029 mV
    LTC3880-XF1-1.0v-CH1       1033 mV
    LTC3880-XF1-1.5v-CH0       1500 mV
ADC 3 status:
  State                       Online
  Intake Temperature          39 degrees C / 102 degrees F
  Exhaust Temperature         50 degrees C / 122 degrees F
```

```
  ADC-XF1 Temperature        61 degrees C / 141 degrees F
  ADC-XF0 Temperature        63 degrees C / 145 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL     1030 mV
    LTC3880-XF0-1.0v-CH0      1030 mV
    LTC3880-XF0-1.0v-CH1      1033 mV
    LTC3880-XF0-1.5v-RAIL     1500 mV
    LTC3880-XF0-1.5v-CH0      1500 mV
    LTC3880-XF0-1.5v-CH1      1501 mV
    LTC3880-XF1-1.0v-RAIL     1029 mV
    LTC3880-XF1-1.0v-CH0      1029 mV
    LTC3880-XF1-1.0v-CH1      1033 mV
    LTC3880-XF1-1.5v-RAIL     1500 mV
    LTC3880-XF1-1.5v-CH0      1500 mV
    LTC3880-XF1-1.5v-CH1      1502 mV
ADC 4 status:
  State                      Online
  Intake Temperature         38 degrees C / 100 degrees F
  Exhaust Temperature        49 degrees C / 120 degrees F
  ADC-XF1 Temperature        60 degrees C / 140 degrees F
  ADC-XF0 Temperature        62 degrees C / 143 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL     1029 mV
    LTC3880-XF0-1.0v-CH0      1029 mV
    LTC3880-XF0-1.0v-CH1      1033 mV
    LTC3880-XF0-1.5v-RAIL     1500 mV
    LTC3880-XF0-1.5v-CH0      1500 mV
    LTC3880-XF0-1.5v-CH1      1501 mV
    LTC3880-XF1-1.0v-RAIL     1029 mV
    LTC3880-XF1-1.0v-CH0      1029 mV
    LTC3880-XF1-1.0v-CH1      1033 mV
    LTC3880-XF1-1.5v-RAIL     1500 mV
    LTC3880-XF1-1.5v-CH0      1500 mV
    LTC3880-XF1-1.5v-CH1      1502 mV
ADC 5 status:
  State                      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
    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
    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
    LTC3880-XF0-1.5v-RAIL     1499 mV
    LTC3880-XF0-1.5v-CH0      1499 mV
    LTC3880-XF0-1.5v-CH1      1501 mV
    LTC3880-XF1-1.0v-RAIL     1030 mV
    LTC3880-XF1-1.0v-CH0      1030 mV
    LTC3880-XF1-1.0v-CH1      1034 mV
    LTC3880-XF1-1.5v-RAIL     1499 mV
    LTC3880-XF1-1.5v-CH0      1499 mV
    LTC3880-XF1-1.5v-CH1      1502 mV
ADC 16 status:
  State                      Online
  Intake Temperature         51 degrees C / 123 degrees F
  Exhaust Temperature        56 degrees C / 132 degrees F
  ADC-XF1 Temperature        67 degrees C / 152 degrees F
  ADC-XF0 Temperature        68 degrees C / 154 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL     1029 mV
    LTC3880-XF0-1.0v-CH0      1029 mV
```

```
    LTC3880-XF0-1.0v-CH1      1033 mV
    LTC3880-XF0-1.5v-RAIL     1499 mV
    LTC3880-XF0-1.5v-CH0      1499 mV
    LTC3880-XF0-1.5v-CH1      1501 mV
    LTC3880-XF1-1.0v-RAIL     1029 mV
    LTC3880-XF1-1.0v-CH0      1029 mV
    LTC3880-XF1-1.0v-CH1      1033 mV
    LTC3880-XF1-1.5v-RAIL     1500 mV
    LTC3880-XF1-1.5v-CH0      1500 mV
    LTC3880-XF1-1.5v-CH1      1502 mV
ADC 17 status:
  State                      Online
  Intake Temperature         51 degrees C / 123 degrees F
  Exhaust Temperature        56 degrees C / 132 degrees F
  ADC-XF1 Temperature        68 degrees C / 154 degrees F
  ADC-XF0 Temperature        69 degrees C / 156 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL     1030 mV
    LTC3880-XF0-1.0v-CH0      1030 mV
    LTC3880-XF0-1.0v-CH1      1033 mV
    LTC3880-XF0-1.5v-RAIL     1500 mV
    LTC3880-XF0-1.5v-CH0      1500 mV
    LTC3880-XF0-1.5v-CH1      1501 mV
    LTC3880-XF1-1.0v-RAIL     1030 mV
    LTC3880-XF1-1.0v-CH0      1030 mV
    LTC3880-XF1-1.0v-CH1      1034 mV
    LTC3880-XF1-1.5v-RAIL     1500 mV
    LTC3880-XF1-1.5v-CH0      1500 mV
    LTC3880-XF1-1.5v-CH1      1502 mV
ADC 18 status:
  State                      Online
  Intake Temperature         52 degrees C / 125 degrees F
  Exhaust Temperature        57 degrees C / 134 degrees F
  ADC-XF1 Temperature        66 degrees C / 150 degrees F
  ADC-XF0 Temperature        71 degrees C / 159 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL     1030 mV
    LTC3880-XF0-1.0v-CH0      1030 mV
    LTC3880-XF0-1.0v-CH1      1034 mV
    LTC3880-XF0-1.5v-RAIL     1499 mV
    LTC3880-XF0-1.5v-CH0      1499 mV
    LTC3880-XF0-1.5v-CH1      1501 mV
    LTC3880-XF1-1.0v-RAIL     1030 mV
    LTC3880-XF1-1.0v-CH0      1030 mV
    LTC3880-XF1-1.0v-CH1      1034 mV
    LTC3880-XF1-1.5v-RAIL     1500 mV
    LTC3880-XF1-1.5v-CH0      1500 mV
    LTC3880-XF1-1.5v-CH1      1502 mV
ADC 19 status:
  State                      Online
  Intake Temperature         49 degrees C / 120 degrees F
  Exhaust Temperature        56 degrees C / 132 degrees F
  ADC-XF1 Temperature        67 degrees C / 152 degrees F
  ADC-XF0 Temperature        70 degrees C / 158 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL     1029 mV
    LTC3880-XF0-1.0v-CH0      1029 mV
    LTC3880-XF0-1.0v-CH1      1033 mV
    LTC3880-XF0-1.5v-RAIL     1499 mV
    LTC3880-XF0-1.5v-CH0      1499 mV
    LTC3880-XF0-1.5v-CH1      1501 mV
```



```
    LTC3880-XF1-1.0v-RAIL      1030 mV
    LTC3880-XF1-1.0v-CH0       1030 mV
    LTC3880-XF1-1.0v-CH1       1033 mV
    LTC3880-XF1-1.5v-RAIL      1500 mV
    LTC3880-XF1-1.5v-CH0       1500 mV
    LTC3880-XF1-1.5v-CH1       1502 mV
```

show chassis environment adc (MX2010 Router)

```
user@host> show chassis environment adc
ADC 0 status:
  State                      Online
  Intake Temperature         33 degrees C / 91 degrees F
  Exhaust Temperature        42 degrees C / 107 degrees F
  ADC-XF1 Temperature        46 degrees C / 114 degrees F
  ADC-XF0 Temperature        53 degrees C / 127 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL       998 mV
    LTC3880-XF0-1.0v-CH0        998 mV
    LTC3880-XF0-1.0v-CH1       1001 mV
    LTC3880-XF0-1.5v-RAIL      1454 mV
    LTC3880-XF0-1.5v-CH0       1454 mV
    LTC3880-XF0-1.5v-CH1       1456 mV
    LTC3880-XF1-1.0v-RAIL       998 mV
    LTC3880-XF1-1.0v-CH0        998 mV
    LTC3880-XF1-1.0v-CH1       1002 mV
    LTC3880-XF1-1.5v-RAIL      1454 mV
    LTC3880-XF1-1.5v-CH0       1454 mV
    LTC3880-XF1-1.5v-CH1       1457 mV
ADC 1 status:
  State                      Online
  Intake Temperature         32 degrees C / 89 degrees F
  Exhaust Temperature        42 degrees C / 107 degrees F
  ADC-XF1 Temperature        44 degrees C / 111 degrees F
  ADC-XF0 Temperature        52 degrees C / 125 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL       998 mV
    LTC3880-XF0-1.0v-CH0        998 mV
    LTC3880-XF0-1.0v-CH1       1002 mV
    LTC3880-XF0-1.5v-RAIL      1454 mV
    LTC3880-XF0-1.5v-CH0       1454 mV
    LTC3880-XF0-1.5v-CH1       1456 mV
    LTC3880-XF1-1.0v-RAIL       999 mV
    LTC3880-XF1-1.0v-CH0        999 mV
    LTC3880-XF1-1.0v-CH1       1002 mV
    LTC3880-XF1-1.5v-RAIL      1454 mV
    LTC3880-XF1-1.5v-CH0       1454 mV
    LTC3880-XF1-1.5v-CH1       1456 mV
ADC 2 status:
  State                      Online
  Intake Temperature         35 degrees C / 95 degrees F
  Exhaust Temperature        42 degrees C / 107 degrees F
  ADC-XF1 Temperature        48 degrees C / 118 degrees F
  ADC-XF0 Temperature        54 degrees C / 129 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL      1030 mV
    LTC3880-XF0-1.0v-CH0       1030 mV
    LTC3880-XF0-1.0v-CH1       1033 mV
    LTC3880-XF0-1.5v-RAIL      1500 mV
    LTC3880-XF0-1.5v-CH0       1500 mV
    LTC3880-XF0-1.5v-CH1       1501 mV
    LTC3880-XF1-1.0v-RAIL      1029 mV
    LTC3880-XF1-1.0v-CH0       1029 mV
```

```
    LTC3880-XF1-1.0v-CH1      1033 mV
    LTC3880-XF1-1.5v-RAIL     1499 mV
    LTC3880-XF1-1.5v-CH0      1499 mV
LTC3880-XF1-1.5v-CH1      1502 mV
ADC 3 status:
  State                      Online
  Intake Temperature         35 degrees C / 95 degrees F
  Exhaust Temperature        40 degrees C / 104 degrees F
  ADC-XF1 Temperature        44 degrees C / 111 degrees F
  ADC-XF0 Temperature        51 degrees C / 123 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL      999 mV
    LTC3880-XF0-1.0v-CH0       999 mV
    LTC3880-XF0-1.0v-CH1      1002 mV
    LTC3880-XF0-1.5v-RAIL     1454 mV
    LTC3880-XF0-1.5v-CH0      1454 mV
    LTC3880-XF0-1.5v-CH1      1456 mV
    LTC3880-XF1-1.0v-RAIL      999 mV
    LTC3880-XF1-1.0v-CH0       999 mV
    LTC3880-XF1-1.0v-CH1      1002 mV
    LTC3880-XF1-1.5v-RAIL     1454 mV
    LTC3880-XF1-1.5v-CH0      1454 mV
    LTC3880-XF1-1.5v-CH1      1457 mV
ADC 4 status:
  State                      Online
  Intake Temperature         31 degrees C / 87 degrees F
  Exhaust Temperature        43 degrees C / 109 degrees F
  ADC-XF1 Temperature        48 degrees C / 118 degrees F
  ADC-XF0 Temperature        56 degrees C / 132 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL     1029 mV
    LTC3880-XF0-1.0v-CH0      1029 mV
    LTC3880-XF0-1.0v-CH1      1033 mV
    LTC3880-XF0-1.5v-RAIL     1499 mV
    LTC3880-XF0-1.5v-CH0      1499 mV
    LTC3880-XF0-1.5v-CH1      1501 mV
    LTC3880-XF1-1.0v-RAIL     1030 mV
    LTC3880-XF1-1.0v-CH0      1030 mV
    LTC3880-XF1-1.0v-CH1      1033 mV
    LTC3880-XF1-1.5v-RAIL     1499 mV
    LTC3880-XF1-1.5v-CH0      1499 mV
    LTC3880-XF1-1.5v-CH1      1502 mV
ADC 5 status:
  State                      Online
  Intake Temperature         33 degrees C / 91 degrees F
  Exhaust Temperature        43 degrees C / 109 degrees F
  ADC-XF1 Temperature        47 degrees C / 116 degrees F
  ADC-XF0 Temperature        54 degrees C / 129 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL      999 mV
    LTC3880-XF0-1.0v-CH0       999 mV
    LTC3880-XF0-1.0v-CH1      1002 mV
    LTC3880-XF0-1.5v-RAIL     1454 mV
    LTC3880-XF0-1.5v-CH0      1454 mV
    LTC3880-XF0-1.5v-CH1      1456 mV
    LTC3880-XF1-1.0v-RAIL      998 mV
    LTC3880-XF1-1.0v-CH0       998 mV
    LTC3880-XF1-1.0v-CH1      1002 mV
    LTC3880-XF1-1.5v-RAIL     1454 mV
 LTC3880-XF1-1.5v-CH0      1454 mV
    LTC3880-XF1-1.5v-CH1      1457 mV
```



```
ADC 6 status:
  State                       Online
  Intake Temperature          32 degrees C / 89 degrees F
  Exhaust Temperature         42 degrees C / 107 degrees F
  ADC-XF1 Temperature         47 degrees C / 116 degrees F
  ADC-XF0 Temperature         55 degrees C / 131 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL      1030 mV
    LTC3880-XF0-1.0v-CH0       1030 mV
    LTC3880-XF0-1.0v-CH1       1033 mV
    LTC3880-XF0-1.5v-RAIL      1499 mV
    LTC3880-XF0-1.5v-CH0       1499 mV
    LTC3880-XF0-1.5v-CH1       1501 mV
    LTC3880-XF1-1.0v-RAIL      1030 mV
    LTC3880-XF1-1.0v-CH0       1030 mV
    LTC3880-XF1-1.0v-CH1       1033 mV
    LTC3880-XF1-1.5v-RAIL      1499 mV
    LTC3880-XF1-1.5v-CH0       1499 mV
    LTC3880-XF1-1.5v-CH1       1502 mV
ADC 7 status:
  State                       Online
  Intake Temperature          36 degrees C / 96 degrees F
  Exhaust Temperature         43 degrees C / 109 degrees F
  ADC-XF1 Temperature         46 degrees C / 114 degrees F
  ADC-XF0 Temperature         55 degrees C / 131 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL      1030 mV
    LTC3880-XF0-1.0v-CH0       1030 mV
    LTC3880-XF0-1.0v-CH1       1033 mV
    LTC3880-XF0-1.5v-RAIL      1500 mV
    LTC3880-XF0-1.5v-CH0       1500 mV
    LTC3880-XF0-1.5v-CH1       1501 mV
    LTC3880-XF1-1.0v-RAIL      1030 mV
    LTC3880-XF1-1.0v-CH0       1030 mV
    LTC3880-XF1-1.0v-CH1       1033 mV
    LTC3880-XF1-1.5v-RAIL      1499 mV
    LTC3880-XF1-1.5v-CH0       1499 mV
    LTC3880-XF1-1.5v-CH1       1502 mV
ADC 8 status:
  State                       Online
  Intake Temperature          35 degrees C / 95 degrees F
  Exhaust Temperature         43 degrees C / 109 degrees F
  ADC-XF1 Temperature         44 degrees C / 111 degrees F
  ADC-XF0 Temperature         51 degrees C / 123 degrees F
  Power
    LTC3880-XF0-1.0v-RAIL       999 mV
    LTC3880-XF0-1.0v-CH0        999 mV
    LTC3880-XF0-1.0v-CH1       1002 mV
    LTC3880-XF0-1.5v-RAIL      1455 mV
    LTC3880-XF0-1.5v-CH0       1455 mV
    LTC3880-XF0-1.5v-CH1       1456 mV
    LTC3880-XF1-1.0v-RAIL       999 mV
    LTC3880-XF1-1.0v-CH0        999 mV
    LTC3880-XF1-1.0v-CH1       1002 mV
 LTC3880-XF1-1.5v-RAIL      1455 mV
    LTC3880-XF1-1.5v-CH0       1455 mV
    LTC3880-XF1-1.5v-CH1       1457 mV
ADC 9 status:
  State                       Online
  Intake Temperature          31 degrees C / 87 degrees F
  Exhaust Temperature         43 degrees C / 109 degrees F
```



```
ADC-XF1 Temperature        48 degrees C / 118 degrees F
ADC-XF0 Temperature        56 degrees C / 132 degrees F
Power
  LTC3880-XF0-1.0v-RAIL     1029 mV
  LTC3880-XF0-1.0v-CH0      1029 mV
  LTC3880-XF0-1.0v-CH1      1033 mV
  LTC3880-XF0-1.5v-RAIL     1455 mV
  LTC3880-XF0-1.5v-CH0      1455 mV
  LTC3880-XF0-1.5v-CH1      1457 mV
  LTC3880-XF1-1.0v-RAIL     1029 mV
  LTC3880-XF1-1.0v-CH0      1029 mV
  LTC3880-XF1-1.0v-CH1      1033 mV
  LTC3880-XF1-1.5v-RAIL     1454 mV
  LTC3880-XF1-1.5v-CH0      1454 mV
  LTC3880-XF1-1.5v-CH1      1457 mV
```

show chassis environment cb

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 (MX2010 3D Universal Edge Routers)

show chassis environment cb
<*slot*>

Syntax (MX2020 3D Universal Edge Routers)

show chassis environment cb
<*slot*>

Syntax (QFabric System)

show chassis environment cb
<*slot* interconnect-device *interconnect-device-name*>
< interconnect-device *interconnect-device-name 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 12.1 for PTX Series Packet Transport Switches.
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.

Description

(M120, M320, MX Series, and T Series routers, EX8200 switches, and PTX Series Packet Transport Switches only) Display environmental information about the Control Boards (CBs). For information about the meaning of "CBs" on the switches, see EX Series Switches Hardware and CLI Terminology Mapping.

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 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 the CBs on the Interconnect device.

lcc ***number***—(TX Matrix and TX Matrix Plus routers only) (Optional) For a TX Matrix router, display environmental information about the CBs in a specified T640 router (or line-card chassis) that is connected to the TX Matrix router. For a TX Matrix Plus router, display environmental information about the CBs in a specified T1600 router (or line-card chassis) that is connected to the TX Matrix Plus router. Replace ***number*** with a value from **0** through **3**.

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 (or 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 Switches, 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 382
- Switching Control Board Redundancy
- Routing Engine and Switching Control Board Redundancy Configuration Statements

List of Sample Output

show chassis environment cb (TX Matrix Router) on page 518
show chassis environment cb (TX Matrix Plus Router) on page 519
show chassis environment cb (EX8200 Switch) on page 523
show chassis environment cb (EX8208 Switch) on page 524
show chassis environment cb (PTX5000 Packet Transport Switch) on page 525
show chassis environment cb (QFabric System) on page 526

Output Fields Table 33 on page 511 lists the output fields for the **show chassis environment cb** command. Output fields are listed in the approximate order in which they appear.

Table 33: show chassis environment cb Output Fields

Field Name	Field Description
State	Status of the CB. If two CBs are installed and online, one is functioning as the master, and the other is the standby. • **Online**—CB is online and running. • **Offline**— CB is powered down. NOTE: On the EX8208 switch, the installation can include three CBs. See EX Series Switches Hardware and CLI Terminology Mapping.
Temperature	Temperature in Celsius (C) and Fahrenheit (F) of the air flowing past the CB. • **Temperature Intake**—Measures the temperature of the air intake to cool the power supplies. • **Temperature Exhaust**—Measures the temperature of the hot air exhaust. 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**).
Power	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.
BUS Revision	Revision level of the generic bus device. (Not on switches.)
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: • **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 (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

```
user@host> show chassis environment cb
CB 0 status:
  State                      Online Standby
```


(MX240 Router with Enhanced MX SCB)

```
  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

```
user@host> show chassis environment cb
CB 0 status:
  State                       Online Master
```


(MX480 Router with Enhanced MX SCB)

```
  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

```
user@host> show chassis environment cb
CB 0 status:
  State                      Online Master
```

(MX960 Router with Enhanced MX SCB)

```
  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              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 (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

```
user@host> show chassis environment cb
sfc0-re0:
--------------------------------------------------------------------------
```

(TX Matrix Plus Router)

```
CB 0 status:
  State                      Online Master
  Temperature                38 degrees C / 100 degrees F
  Power 1
    1.0 V                     1005 mV
    1.1 V                     1108 mV
    1.2 V                     1205 mV
    1.25 V                    1269 mV
    1.5 V                     1508 mV
    1.8 V                     1814 mV
    2.5 V                     2507 mV
    3.3 V                     3306 mV
    3.3 V bias                3300 mV
    9.0 V                     9058 mV
    9.0 V RE                  9107 mV
  Power 2
    3.9 V                     3963 mV
    5.0 V                     5020 mV
    9.0 V                     9087 mV
  Bus Revision               79
  FPGA Revision              23
CB 1 status:
  State                      Online Standby
  Temperature                39 degrees C / 102 degrees F
  Power 1
    1.0 V                     1002 mV
    1.1 V                     1105 mV
    1.2 V                     1198 mV
    1.25 V                    1276 mV
    1.5 V                     1504 mV
    1.8 V                     1804 mV
    2.5 V                     2507 mV
    3.3 V                     3300 mV
    3.3 V bias                3293 mV
    9.0 V                     9039 mV
    9.0 V RE                  9049 mV
  Power 2
    3.9 V                     3892 mV
    5.0 V                     5040 mV
    9.0 V                     9058 mV
  Bus Revision               79
  FPGA Revision              23

lcc0-re0:
--------------------------------------------------------------------------
CB 0 status:
  State                      Online Master
  Temperature                39 degrees C / 102 degrees F
  Power 1
    1.8 V                     1799 mV
    2.5 V                     2499 mV
    3.3 V                     3327 mV
    3.3 V bias                3299 mV
    4.6 V                     4673 mV
    5.0 V                     4918 mV
    8.0 V bias                7308 mV
    12.0 V                   11887 mV
  Power 2
    1.0 V                      996 mV
    1.2 V                     1199 mV
    3.3 V RE                  3319 mV
```

```
  Bus Revision              51
  FPGA Revision             3
CB 1 status:
  State                     Online Standby
  Temperature               40 degrees C / 104 degrees F
  Power 1
    1.8 V                    1800 mV
    2.5 V                    2496 mV
    3.3 V                    3322 mV
    3.3 V bias               3284 mV
    4.6 V                    4680 mV
    5.0 V                    4954 mV
    8.0 V bias               7284 mV
    12.0 V                  11902 mV
  Power 2
    1.0 V                     998 mV
    1.2 V                    1205 mV
    3.3 V RE                 3327 mV
  Bus Revision              51
  FPGA Revision             3

lcc1-re0:
--------------------------------------------------------------------------
CB 0 status:
  State                     Online Master
  Temperature               41 degrees C / 105 degrees F
  Power 1
    1.8 V                    1804 mV
    2.5 V                    2517 mV
    3.3 V                    3300 mV
    3.3 V bias               3284 mV
    4.6 V                    4681 mV
    5.0 V                    4927 mV
    8.0 V bias               7357 mV
    12.0 V                  11907 mV
  Power 2
    1.0 V                     991 mV
    1.2 V                    1202 mV
    3.3 V RE                 3301 mV
  Bus Revision              51
  FPGA Revision             3
CB 1 status:
  State                     Online Standby
  Temperature               40 degrees C / 104 degrees F
  Power 1
    1.8 V                    1805 mV
    2.5 V                    2528 mV
    3.3 V                    3324 mV
    3.3 V bias               3289 mV
    4.6 V                    4694 mV
    5.0 V                    4959 mV
    8.0 V bias               7311 mV
    12.0 V                  11926 mV
  Power 2
    1.0 V                     998 mV
    1.2 V                    1200 mV
    3.3 V RE                 3313 mV
  Bus Revision              51
  FPGA Revision             3

lcc2-re0:
```

```
--------------------------------------------------------------------------
CB 0 status:
  State                       Online Master
  Temperature                 41 degrees C / 105 degrees F
  Power 1
    1.8 V                      1805 mV
    2.5 V                      2494 mV
    3.3 V                      3333 mV
    3.3 V bias                 3296 mV
    4.6 V                      4673 mV
    5.0 V                      4901 mV
    8.0 V bias                 7343 mV
    12.0 V                    11916 mV
  Power 2
    1.0 V                       993 mV
    1.2 V                      1213 mV
    3.3 V RE                   3328 mV
  Bus Revision                51
  FPGA Revision               3
CB 1 status:
  State                       Online Standby
  Temperature                 41 degrees C / 105 degrees F
  Power 1
    1.8 V                      1804 mV
    2.5 V                      2523 mV
    3.3 V                      3334 mV
    3.3 V bias                 3291 mV
    4.6 V                      4697 mV
    5.0 V                      4969 mV
    8.0 V bias                 7308 mV
    12.0 V                    11936 mV
  Power 2
    1.0 V                       996 mV
    1.2 V                      1200 mV
    3.3 V RE                   3328 mV
  Bus Revision                51
  FPGA Revision               3

lcc3-re0:
--------------------------------------------------------------------------
CB 0 status:
  State                       Online Master
  Temperature                 37 degrees C / 98 degrees F
  Power 1
    1.8 V                      1809 mV
    2.5 V                      2510 mV
    3.3 V                      3296 mV
    3.3 V bias                 3291 mV
    4.6 V                      4670 mV
    5.0 V                      4905 mV
    8.0 V bias                 7211 mV
    12.0 V                    11882 mV
  Power 2
    1.0 V                       996 mV
    1.2 V                      1188 mV
    3.3 V RE                   3326 mV
  Bus Revision                51
  FPGA Revision               5
CB 1 status:
  State                       Online Standby
  Temperature                 38 degrees C / 100 degrees F
```



```
  Power 1
    1.8 V                     1813 mV
    2.5 V                     2510 mV
    3.3 V                     3322 mV
    3.3 V bias                3289 mV
    4.6 V                     4692 mV
    5.0 V                     4967 mV
    8.0 V bias                7194 mV
    12.0 V                   11916 mV
  Power 2
    1.0 V                      996 mV
    1.2 V                     1205 mV
    3.3 V RE                  3273 mV
  Bus Revision               51
  FPGA Revision              5
```

show chassis environment cb (EX8200 Switch)

user@host> **show chassis environment cb**

```
CB 0 status:
  State                      Online Master
  Temperature Intake         20 degrees C / 68 degrees F
  Temperature Exhaust        24 degrees C / 75 degrees F
  Power 1
    1.1 V                     1086 mV
    1.2 V                     1179 mV
    1.2 V *                   1182 mV
    1.2 V *                   1182 mV
    1.25 V                    1211 mV
    1.5 V                     1472 mV
    1.8 V                     1756 mV
    2.5 V                     2449 mV
    3.3 V                     3254 mV
    3.3 V bias                3300 mV
    5.0 V                     4911 mV
    12.0 V                   11891 mV
  Power 2
    3.3 V bias *              3615 mV
    3.3 V bias *              3615 mV
    3.3 V bias *              3567 mV
    3.3 V bias *              3664 mV
    4.3 V bias *              4224 mV
    4.3 V bias *              4215 mV
    4.3 V bias *              4224 mV
    4.3 V bias *              4205 mV
    4.3 V bias *              4195 mV
    4.3 V bias *              4215 mV
    5.0 V bias                4920 mV
CB 1 status:
  State                      Online Standby
  Temperature Intake         19 degrees C / 66 degrees F
  Temperature Exhaust        23 degrees C / 73 degrees F
  Power 1
    1.1 V                     1082 mV
    1.2 V                     1169 mV
    1.2 V *                   1179 mV
    1.2 V *                   1179 mV
    1.25 V                    1214 mV
    1.5 V                     1482 mV
    1.8 V                     1759 mV
    2.5 V                     2481 mV
    3.3 V                     3248 mV
```



```
      3.3 V bias                3306 mV
      5.0 V                     4911 mV
      12.0 V                   11910 mV
    Power 2
      3.3 V bias *              3644 mV
      3.3 V bias *              3664 mV
      3.3 V bias *              3586 mV
      3.3 V bias *              3654 mV
      4.3 V bias *              4224 mV
      4.3 V bias *              4215 mV
      4.3 V bias *              4224 mV
      4.3 V bias *              4205 mV
      4.3 V bias *              4244 mV
      4.3 V bias *              4215 mV
      5.0 V bias                4930 mV
  CB 2 status:
    State                      Online
    Temperature Intake         19 degrees C / 66 degrees F
    Temperature Exhaust        23 degrees C / 73 degrees F
    Power 1
      1.2 V                     1195 mV
      1.5 V                     1511 mV
      1.8 V                     1804 mV
      2.5 V                     2526 mV
      3.3 V                     3300 mV
      3.3 V bias                3306 mV
      12.0 V                   12220 mV
```

show chassis environment cb (EX8208 Switch)

user@host> **show chassis environment cb**

```
CB 0 status:
  State                      Online Master
  Temperature Intake         20 degrees C / 68 degrees F
  Temperature Exhaust        24 degrees C / 75 degrees F
  Power 1
    1.1 V                     1086 mV
    1.2 V                     1179 mV
    1.2 V *                   1182 mV
    1.2 V *                   1182 mV
    1.25 V                    1211 mV
    1.5 V                     1466 mV
    1.8 V                     1759 mV
    2.5 V                     2455 mV
    3.3 V                     3261 mV
    3.3 V bias                3300 mV
    5.0 V                     4930 mV
    12.0 V                   11891 mV
  Power 2
    3.3 V bias *              3606 mV
    3.3 V bias *              3615 mV
    3.3 V bias *              3567 mV
    3.3 V bias *              3673 mV
    4.3 V bias *              4224 mV
    4.3 V bias *              4215 mV
    4.3 V bias *              4234 mV
    4.3 V bias *              4205 mV
    4.3 V bias *              4186 mV
    4.3 V bias *              4215 mV
    5.0 V bias                4940 mV
CB 1 status:
  State                      Online Standby
  Temperature Intake         19 degrees C / 66 degrees F
```



```
  Temperature Exhaust        23 degrees C / 73 degrees F
  Power 1
    1.1 V                     1086 mV
    1.2 V                     1169 mV
    1.2 V *                   1179 mV
    1.2 V *                   1179 mV
    1.25 V                    1211 mV
    1.5 V                     1479 mV
    1.8 V                     1759 mV
    2.5 V                     2475 mV
    3.3 V                     3235 mV
    3.3 V bias                3306 mV
    5.0 V                     4930 mV
    12.0 V                   11891 mV
  Power 2
    3.3 V bias *              3644 mV
    3.3 V bias *              3664 mV
    3.3 V bias *              3586 mV
    3.3 V bias *              3654 mV
    4.3 V bias *              4215 mV
    4.3 V bias *              4224 mV
    4.3 V bias *              4215 mV
    4.3 V bias *              4215 mV
    4.3 V bias *              4234 mV
    4.3 V bias *              4224 mV
    5.0 V bias                4920 mV
CB 2 status:
  State                      Online
  Temperature Intake         20 degrees C / 68 degrees F
  Temperature Exhaust        24 degrees C / 75 degrees F
  Power 1
    1.2 V                     1202 mV
    1.5 V                     1508 mV
    1.8 V                     1804 mV
    2.5 V                     2520 mV
    3.3 V                     3300 mV
    3.3 V bias                3300 mV
    12.0 V                   12200 mV
```

show chassis environment cb

```
user@host> show chassis environment cb
CB 0 status:
  State                      Online Master
```

(PTX5000 Packet Transport Switch)

```
  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 fpc

Syntax

show chassis environment fpc
<*slot*>

Syntax (TX Matrix and TX Matrix Plus Routers)

show chassis environment fpc
<lcc *number*>
<*slot*>

Syntax (MX Series Routers)

show chassis environment fpc
<*slot*>
<all-members>
<local>
<member *member-id*>

Syntax (MX2010 3D Universal Edge Routers)

show chassis environment fpc
<*slot*>

Syntax (MX2020 3D Universal Edge Routers)

show chassis environment fpc
<*slot*>

Syntax (QFX Series)

show chassis environment fpc
<fpc-slot>
interconnect-device *name*

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 12.1 for PTX Series Packet Transport Switches.
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.

Description

(M40e, M120, M160, M320, MX Series, T Series routers, EX Series, QFX Series, and PTX Series switches 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 T1600 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 and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display environmental information about the FPC in a T640 router (or line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display environmental information about the FPC in a T1600 router (or line-card chassis) that is connected to the TX Matrix Plus router. Replace ***number*** with a value from **0** through **3**.

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.

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 T1600 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 Switch—Replace ***fpc-slot*** with 0 through 7.

Required Privilege Level view

Related Documentation

- request chassis fpc on page 391
- show chassis fpc on page 849
- show chassis fpc-feb-connectivity on page 876
- Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 125
- MX960 Flexible PIC Concentrator Description

List of Sample Output

Output Fields Table 34 on page 530 lists the output fields for the **show chassis environment fpc** command. Output fields are listed in the approximate order in which they appear.

Table 34: show chassis environment fpc Output Fields

Field Name	Field Description
State	Status of the FPC: • **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	(PTX Series only) Temperature of the air flowing past the PMB (bottom of the FPC).
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 Switches, 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 *n* Temperature	(PTX Series only) Temperature of the air flowing past the specified TL area of the packet forwarding engine (PFE) on the FPC.
TQ *n* 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

user@host> show chassis environment fpc
```

show chassis environment fpc (M160 Router)

```
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-zl2105         3299 mV
    AS-VDD1V8-zl2006          1807 mV
    AS-VDD2V5-zl2006          2512 mV
    AS-AVDD1V0-zl2004          997 mV
    AS-PCIE_1V0-zl2004         996 mV
    AS-VDD3V3-zl2004          3294 mV
    AS-VDD_1V5A-zl2004        1501 mV
    AS-VDD_1V5B-zl2004        1498 mV
    AS-LU0_1V0-zl2004          998 mV
    AS-LU1_1V0-zl2004         1002 mV
    AS-MQ0_1V0-zl2004          999 mV
    AS-MQ1_1V0-zl2004          994 mV
    AS-LU2_1V0-zl2004         1000 mV
    AS-LU3_1V0-zl2004          998 mV
    AS-MQ2_1V0-zl2004         1002 mV
    AS-MQ3_1V0-zl2004          999 mV
    AS-PMB_1V1-zl2006         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-zl2105         3291 mV
      AS-VDD1V8-zl2006          1786 mV
      AS-VDD2V5-zl2006          2496 mV
      AS-AVDD1V0-zl2004         1000 mV
      AS-PCIE_1V0-zl2004        1000 mV
      AS-VDD3V3-zl2004          3294 mV
      AS-VDD_1V5A-zl2004        1500 mV
      AS-VDD_1V5B-zl2004        1498 mV
      AS-LU0_1V0-zl2004         1003 mV
      AS-LU1_1V0-zl2004         1000 mV
      AS-MQ0_1V0-zl2004         1000 mV
      AS-MQ1_1V0-zl2004          995 mV
      AS-LU2_1V0-zl2004         1002 mV
      AS-LU3_1V0-zl2004          997 mV
      AS-MQ2_1V0-zl2004         1000 mV
      AS-MQ3_1V0-zl2004          998 mV
      AS-PMB_1V1-zl2006         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-zl2105         3299 mV
      AS-VDD1V8-zl2006          1805 mV
      AS-VDD2V5-zl2006          2510 mV
      AS-AVDD1V0-zl2004          999 mV
      AS-PCIE_1V0-zl2004         998 mV
      AS-VDD3V3-zl2004          3296 mV
      AS-VDD_1V5A-zl2004        1492 mV
      AS-VDD_1V5B-zl2004        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-zl2105         3300 mV
      AS-VDD1V8-zl2006          1805 mV
      AS-VDD2V5-zl2006          2505 mV
      AS-AVDD1V0-zl2004          998 mV
      AS-PCIE_1V0-zl2004         999 mV
      AS-VDD3V3-zl2004          3303 mV
      AS-VDD_1V5A-zl2004        1497 mV
      AS-VDD_1V5B-zl2004        1497 mV
      AS-LU0_1V0-zl2004          998 mV
      AS-LU1_1V0-zl2004         1003 mV
      AS-MQ0_1V0-zl2004          998 mV
      AS-MQ1_1V0-zl2004          998 mV
      AS-LU2_1V0-zl2004          997 mV
      AS-LU3_1V0-zl2004         1001 mV
      AS-MQ2_1V0-zl2004          996 mV
      AS-MQ3_1V0-zl2004          994 mV
      AS-PMB_1V1-zl2006         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-zl2105        3300 mV
      MPC-VDD3V3-zl6100         3294 mV
      MPC-VDD2V5-zl6100         2505 mV
      MPC-VDD1V8-zl2004         1796 mV
      MPC-AVDD1V0-zl2004         991 mV
      MPC-VDD1V2-zl6100         1196 mV
      MPC-VDD1V5A-zl2004        1491 mV
      MPC-VDD1V5B-zl2004        1492 mV
```



```
    MPC-XF_0V9-zl2004          996 mV
    MPC-PCIE_1V0-zl6100       1003 mV
    MPC-LU0_1V0-zl2004         996 mV
    MPC-LU1_1V0-zl2004         996 mV
    MPC-LU2_1V0-zl2004         998 mV
    MPC-LU3_1V0-zl2004         994 mV
    MPC-12VA-BMR453          12031 mV
    MPC-12VB-BMR453          12003 mV
    MPC-PMB_1V1-zl2006        1104 mV
    MPC-PMB_1V2-zl2106        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-zl2105        3296 mV
    MPC-VDD3V3-zl2006         3298 mV
    MPC-VDD2V5-zl2006         2505 mV
    MPC-TCAM_1V0-zl2004        997 mV
    MPC-AVDD1V0-zl2006        1007 mV
    MPC-VDD1V8-zl2006         1803 mV
    MPC-PCIE_1V0-zl2006       1004 mV
    MPC-LU0_1V0-zl2004        1000 mV
    MPC-MQ0_1V0-zl2004         999 mV
    MPC-VDD_1V5-zl2004        1498 mV
    MPC-PMB_1V1-zl2006        1102 mV
    MPC-9VA-BMR453            9009 mV
    MPC-9VB-BMR453            8960 mV
    MPC-PMB_1V2-zl2105        1202 mV
    MPC-LU1_1V0-zl2004        1005 mV
    MPC-MQ1_1V0-zl2004        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-zl2105          3302 mV
    AS-VDD1V8-zl2006           1808 mV
    AS-VDD2V5-zl2006           2513 mV
    AS-AVDD1V0-zl2004           997 mV
    AS-PCIE_1V0-zl2004          999 mV
    AS-VDD3V3-zl2004           3294 mV
    AS-VDD_1V5A-zl2004         1503 mV
    AS-VDD_1V5B-zl2004         1502 mV
    AS-LU0_1V0-zl2004           996 mV
    AS-LU1_1V0-zl2004           999 mV
    AS-MQ0_1V0-zl2004           997 mV
    AS-MQ1_1V0-zl2004           999 mV
    AS-LU2_1V0-zl2004           997 mV
    AS-LU3_1V0-zl2004           998 mV
    AS-MQ2_1V0-zl2004          1000 mV
    AS-MQ3_1V0-zl2004          1000 mV
    AS-PMB_1V1-zl2006          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

```
user@host> show chassis environment fpc
FPC 0 status:
  State                      Online
  Temperature Intake         32 degrees C / 89 degrees F
```

100-Gigabit Ethernet CFP)

```
  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-zl2105        3297 mV
    MPC-VDD3V3-zl2105         3306 mV
    MPC-VDD2V5-zl2105         2498 mV
    MPC-TCAM_1V0-zl2004        999 mV
    MPC-AVDD1V0-zl2006         999 mV
    MPC-VDD1V8-zl2006         1796 mV
    MPC-PCIE_1V0-zl2006       1002 mV
    MPC-LU0_1V0-zl2004         997 mV
    MPC-MQ0_1V0-zl2004         995 mV
    MPC-VDD_1V5-zl2004        1496 mV
    MPC-PMB_1V1-zl2006        1094 mV
    MPC-9VA-BMR453            9054 mV
    MPC-9VB-BMR453            9037 mV
    MPC-PMB_1V2-zl2106        1191 mV
    MPC-QXM0_1V0-zl2006       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-zl2105        3292 mV
    MPC-VDD3V3-zl6100         3303 mV
    MPC-VDD2V5-zl6100         2501 mV
    MPC-VDD1V8-zl2004         1801 mV
    MPC-AVDD1V0-zl2006         996 mV
    MPC-VDD1V2-zl6100         1199 mV
    MPC-VDD1V5A-zl2004        1493 mV
    MPC-VDD1V5B-zl2004        1498 mV
    MPC-XF_0V9-zl2006          996 mV
    MPC-PCIE_1V0-zl6100       1000 mV
    MPC-LU0_1V0-zl2004         994 mV
    MPC-LU1_1V0-zl2004         994 mV
    MPC-LU2_1V0-zl2004         992 mV
    MPC-LU3_1V0-zl2004         993 mV
    MPC-12VA-BMR453          12003 mV
    MPC-12VB-BMR453          12043 mV
```

```
    MPC-PMB_1V1-zl2006        1091 mV
    MPC-PMB_1V2-zl2106        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-zl2106        3302 mV
    MPC-VDD3V3-zl6100         3325 mV
    MPC-AVDD1V0-zl6100        1007 mV
    MPC-PCIE_1V0-zl6100        904 mV
    MPC-LU0_1V0-zl2004         996 mV
    MPC-VDD_1V5-zl2004        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

```
user@host> show chassis environment fpc
FPC 0 status:
  State                           Online
```

(T320, T640, and T1600 Routers)

```
  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

```
user@host> show chassis environment fpc lcc 0
lcc0-re0:
--------------------------------------------------------------------------
```

(TX Matrix Plus Router)

```
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)

```
user@switch> show chassis environment fpc 0
FPC 0 status:
  State                       Online
  Temperature                 42 degrees C / 107 degrees F
```

show chassis environment fpc

```
user@switch> show chassis environment fpc interconnect-device interconnect1 0
FC 0 FPC 0 status:
  State                       Online
```


interconnect-device (QFabric Systems)

```
  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 0

```
user@switch> show chassis environment fpc 0
FPC 0 status:
  State                      Online
```


(PTX5000 Packet Transport Switch)

```
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 1 (MX

```
user@switch> show chassis environment fpc 1
FPC 1 status:
  State                       Online
```

Routers with Media Services Blade [MSB])

```
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-zl2106        3302 mV
  MPC-VDD3V3-zl6100         3325 mV
  MPC-AVDD1V0-zl6100        1007 mV
  MPC-PCIE_1V0-zl6100        904 mV
  MPC-LU0_1V0-zl2004         996 mV
  MPC-VDD_1V5-zl2004        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

Syntax show chassis environment fpm

Syntax (TX Matrix Routers) show chassis environment fpm
<lcc *number* | scc>

Syntax (TX Matrix Plus Routers) show chassis environment fpm
<lcc *number* | sfc *number*>

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 Switches.
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.

Description (M40e, M120, M160, M320, MX Series, and T Series routers and the PTX Series Packet Transport Switches only) Display environmental information about the front panel module in the router.

Options

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 T1600 routers.

lcc *number*—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display environmental information about the front panel module (craft interface) on a specified T640 router (or line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display environmental information about the front panel module (craft interface) on 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**.

scc—(TX Matrix router only) (Optional) Display environmental information about the front panel module (craft interface) on the TX Matrix router (or switch-card chassis).

sfc *number*—(TX Matrix Plus router only) (Optional) Display environmental information about the front panel module (craft interface) on the TX Matrix Plus router (or switch-fabric chassis).

Required Privilege Level view

Related Documentation

- request chassis fpm resync on page 395

List of Sample Output

show chassis environment fpm (M40e and M160 Routers) on page 557
show chassis environment fpm (M320 Router) on page 558

show chassis environment fpm (MX2010 Router) on page 558
show chassis environment fpm (MX2020 Router) on page 558
show chassis environment fpm (MX240 Router) on page 558
show chassis environment fpm (MX480 Router) on page 558
show chassis environment fpm (T Series Routers) on page 558
show chassis environment fpm lcc (TX Matrix Router) on page 558
show chassis environment fpm scc (TX Matrix Router) on page 559
show chassis environment fpm sfc (TX Matrix Plus Router) on page 559
show chassis environment fpm (T4000 Core Router) on page 560
show chassis environment fpm (PTX5000 Packet Transport Switch) on page 561

Output Fields

Table 35 on page 556 lists the output fields for the **show chassis environment fpm** command. Output fields are listed in the approximate order in which they appear.

Table 35: show chassis environment fpm Output Fields

Field Name	Field Description
State	FPM status: • **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
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

```
user@host> show chassis environment fpm
FPM status:
  State                          Online
```

(M40e and M160 Routers)

```
  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

```
user@host> show chassis environment fpm sfc

sfc0-re0:
```

(TX Matrix Plus Router)

```
--------------------------------------------------------------------------
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

lcc0-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

lcc1-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 Switch)

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

Syntax show chassis environment monitored

Release Information Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Switches.
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 (PTX Series Packet Transport Switches, and MX2010 and MX2020 routers) Display status information for monitored temperatures.

On the PTX Series Packet Transport Switches, 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.

Options This command has no options.

Required Privilege Level view

List of Sample Output
show chassis environment monitored (PTX5000 Packet Transport Switch) on page 562
show chassis environment monitored (MX2010 Router) on page 563
show chassis environment monitored (MX2020 Router) on page 566

Output Fields Table 36 on page 562 lists the output fields for the **show chassis environment monitored** command. Output fields are listed in the approximate order in which they appear.

Table 36: show chassis environment monitored Output Fields

Field Name	Field Description
Item	Chassis component: • (PTX Series Packet Transport Switches, 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. Status can be **OK** or **Alarm**.
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 (PTX5000

```
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
```

Packet Transport Switch)

```
          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

```
user@host > show chassis environment monitored
Class Item                          Status    Measurement
Temp  CB 0 IntakeA-Zone0            OK        37 degrees C / 98 degrees F
```

monitored (MX2010 Router)

```
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
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```
          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

```
user@host > show chassis environment monitored
Class Item                            Status      Measurement
Temp  CB 0 IntakeA-Zone0              OK          44 degrees C / 111 degrees F
```


monitored (MX2020 Router)

```
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
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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
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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
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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
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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
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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

show chassis environment mcs
<*slot*>

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

- request chassis mcs on page 398

List of Sample Output

show chassis environment mcs (M40e Router) on page 577
show chassis environment mcs (M160 Router) on page 577

Output Fields

Table 37 on page 576 lists the output fields for the **show chassis environment mcs** command. Output fields are listed in the approximate order in which they appear.

Table 37: show chassis environment mcs Output Fields

Field Name	Field Description
State	Status of the MCS: • **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 pcg

Syntax

show chassis environment pcg
<*slot*>

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

none—Display environmental information about both PCGs.

slot—(Optional) Display environmental information about an individual PCG. Replace ***slot*** with 0 or 1.

Required Privilege Level

view

Related Documentation

- request chassis pcg on page 402

List of Sample Output

show chassis environment pcg (M40e Router) on page 579
show chassis environment pcg (M160 Router) on page 579

Output Fields

Table 38 on page 578 lists the output fields for the **show chassis environment pcg** command. Output fields are listed in the approximate order in which they appear.

Table 38: show chassis environment pcg Output Fields

Field Name	Field Description
PCG slot status	Slot number: **0** or **1**.
State	Status of PCG: • **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 pem

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 (QFX Series)
show chassis environment pem
<*slot* (interconnect-device *name slot*) | (node-device *name*)>

Release Information
Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS 11.3 for the QFX 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 878

List of Sample Output

Output Fields Table 39 on page 582 lists the output fields for the **show chassis environment pem** command. Output fields are listed in the approximate order in which they appear.

Table 39: show chassis environment pem Output Fields

Field Name	Field Description
PEM *slot* 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.
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 (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

```
user@host> show chassis environment pem 0 lcc 0
lcc0-re0:
--------------------------------------------------------------------------
```

(TX Matrix Routing Matrix)

```
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

```
user@host> show chassis environment lcc 0

lcc0-re1:
```

(TX Matrix Plus Routing Matrix)

```
----------------------------------------------------------------------------
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)

```
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

```
user@switch> show chassis environment pem interconnect-device IC11
IC1 PEM 1 status:
  State                          Online
```


interconnect-device (QFabric System)

```
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 psm

Syntax

show chassis environment psm
<*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.

Description

Display chassis environmental information about the power supply module (PSM).

Options

none—Display environmental information about all PSMs.

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.

Required Privilege Level

view

Related Documentation

- show chassis environment on page 447

List of Sample Output

show chassis environment psm (MX2020 Router) on page 590
show chassis environment psm (MX2010 Router) on page 592

Output Fields

Table 40 on page 589 lists the output fields for the **show chassis environment psm** command. Output fields are listed in the approximate order in which they appear.

Table 40: show chassis environment psm Output Fields

Field Name	Field Description
State	Status of the PSM. • **Online**—The PSM is online and running. • **Offline**—PSM is powered down.
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 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

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 (MX2010 3D Universal Edge Routers)

show chassis environment routing-engine
<*slot*>

Syntax (MX Series Routers)

show chassis environment routing-engine
<*slot*>
<all-members>
<local>
<member *member-id*>

Syntax (MX2020 3D Universal Edge Routers)

show chassis environment routing-engine
<*slot*>

Syntax (QFX Series)

show chassis environment routing-engine
interconnect-device *name*

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 Switches.
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.

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 T1600 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 and TX Matrix routers only) (Optional) On a TX Matrix router, display environmental information about the Routing Engine in a specified T640 router (or line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display environmental information about the Routing Engine in a specified T1600 router (or line-card chassis) that is connected to the TX Matrix Plus router. Replace ***number*** with a value from **0** through **3**.

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.

scc—(TX Matrix router only) (Optional) Display environmental information about the Routing Engine in the TX Matrix router (or 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, MX2020 routers, and T Series routers, replace ***slot*** with **0** or **1**. On M5, M7i, M10, and M40 routers and on the J Series router, 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 Switches, replace ***slot*** with **0** or **1**

Required Privilege Level

view

Related Documentation

- request chassis routing-engine master on page 407
- show chassis routing-engine on page 1028

List of Sample Output

Output Fields Table 41 on page 596 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 41: show chassis environment routing-engine Output Fields

Field Name	Field Description
Routing engine *slot* status	Number of the Routing Engine slot: **0** or **1**.
State	Status of the Routing Engine: • **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 (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

```
user@host> show chassis environment routing-engine
Routing Engine 0 status:
  State                      Online Master
```

routing-engine (MX2020 Router)

```
  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)

```
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

```
user@switch> show chassis environment routing-engine
Routing Engine 0 status:
  State                       Online Master
  Temperature                 55 degrees C / 131 degrees F
```

(PTX5000 Packet Transport Switch)

```
  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

Syntax

show chassis environment scg
<*slot*>

Syntax (TX Matrix and TX Matrix Plus Router)

show chassis environment scg
<lcc *number*>
<*slot*>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 12.1 for the T4000 Core Routers.

Description

Display SONET Clock Generator (SCG) environmental information.

Options

none—(TX Matrix and TX Matrix Plus routers only) Display environmental information about all SCGs. On a TX Matrix router, display environmental information about all SCGs on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display environmental information about all SCGs on the TX Matrix Plus router and its attached T1600 routers.

lcc *number*—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display environmental information about the SCG in a specified T640 router (or line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display environmental information about the SCG in a specified T1600 router (or line-card chassis) that is connected to the TX Matrix Plus router. Replace ***number*** with a value from **0** through **3**.

slot—(Optional) Display environmental information about the SCG. Replace ***slot*** with **0** or **1**.

Required Privilege Level

view

Related Documentation

- request chassis scg on page 411
- Configuring the Clock Source
- T320 SONET Clock Generator (SCG) Description

List of Sample Output

show chassis environment scg (T Series Routers) on page 601
show chassis environment scg (T4000 Core Routers) on page 601
show chassis environment scg lcc (TX Matrix Router) on page 601
show chassis environment scg lcc (TX Matrix Plus Router) on page 602
show chassis environment scg (TX Matrix Plus Router) on page 602

Output Fields

Table 42 on page 600 lists the output fields for the **show chassis environment scg** command. Output fields are listed in the approximate order in which they appear.

Table 42: 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: • **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

```
user@host> show chassis environment scg
lcc0-re0:
--------------------------------------------------------------------------
```

(TX Matrix Plus Router)

```
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

show chassis environment sfb
<*sfb-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.

Description

Display chassis environmental information about the Switch Fabric Board (SFB).

Options

none—Display environmental information about all Switch Fabric Boards.

sfb-slot-number—(Optional) Display environmental information about the specified Switch Fabric Board. For MX2020 and MX2010 routers, replace ***sfb-slot-number*** with a value from 0 through 7.

Required Privilege Level

view

Related Documentation

- request chassis sfb
- show chassis sfb on page 1050

List of Sample Output

show chassis environment sfb (MX2020 Router) on page 606
show chassis environment sfb (MX2010 Router) on page 610

Output Fields

Table 43 on page 605 lists the output fields for the **show chassis environment sfb** command. Output fields are listed in the approximate order in which they appear.

Table 43: show chassis environment sfb Output Fields

Field Name	Field Description
State	Status of the SFB. • **Online**—The SFB is online and running. • **Offline**— SFB is powered down.
Temperature	Temperature in Celsius (C) and Fahrenheit (F) of the air flowing past the SFB. • **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	Power required and measured on the SFB. The left column displays the required power, in volts. The right column displays the measured power, in millivolts.

Sample Output

show chassis environment sfb (MX2020 Router)

```
user@host> show chassis environment sfb
SFB 0 status:
  State                      Online
  Intake-Zone0 Temperature   51 degrees C / 123 degrees F
  Exhaust-Zone1 Temperature  44 degrees C / 111 degrees F
  IntakeA-Zone0 Temperature  46 degrees C / 114 degrees F
  IntakeB-Zone1 Temperature  37 degrees C / 98 degrees F
  Exhaust-Zone0 Temperature  48 degrees C / 118 degrees F
  SFB-XF2-Zone1 Temperature  58 degrees C / 136 degrees F
  SFB-XF1-Zone0 Temperature  65 degrees C / 149 degrees F
  SFB-XF0-Zone0 Temperature  64 degrees C / 147 degrees F
  Power
    LTC3880-XF2-1.5v-RAIL     1500 mV
    LTC3880-XF2-1.5v-CH0      1500 mV
    LTC3880-XF2-1.5v-CH1      1500 mV
    LTC3880-XF2-1.0v-RAIL     1029 mV
    LTC3880-XF2-1.0v-CH0      1029 mV
    LTC3880-XF2-1.0v-CH1      1032 mV
    LTC3880-XF1-1.5v-RAIL     1499 mV
    LTC3880-XF1-1.5v-CH0      1499 mV
    LTC3880-XF1-1.5v-CH1      1501 mV
    LTC3880-XF1-1.0v-RAIL     1029 mV
    LTC3880-XF1-1.0v-CH0      1029 mV
    LTC3880-XF1-1.0v-CH1      1033 mV
    LTC3880-XF0-1.5v-RAIL     1500 mV
    LTC3880-XF0-1.5v-CH0      1500 mV
    LTC3880-XF0-1.5v-CH1      1501 mV
    LTC3880-XF0-1.0v-RAIL     1029 mV
    LTC3880-XF0-1.0v-CH0      1029 mV
    LTC3880-XF0-1.0v-CH1      1033 mV
    LTC3880-3.3v-RAIL         3300 mV
    LTC3880-3.3v-CH0          3300 mV
    LTC3880-3.3v-CH1          3299 mV
SFB 1 status:
  State                      Online
  Intake-Zone0 Temperature   52 degrees C / 125 degrees F
  Exhaust-Zone1 Temperature  44 degrees C / 111 degrees F
  IntakeA-Zone0 Temperature  47 degrees C / 116 degrees F
  IntakeB-Zone1 Temperature  37 degrees C / 98 degrees F
  Exhaust-Zone0 Temperature  47 degrees C / 116 degrees F
  SFB-XF2-Zone1 Temperature  59 degrees C / 138 degrees F
  SFB-XF1-Zone0 Temperature  63 degrees C / 145 degrees F
  SFB-XF0-Zone0 Temperature  65 degrees C / 149 degrees F
  Power
    LTC3880-XF2-1.5v-RAIL     1500 mV
    LTC3880-XF2-1.5v-CH0      1500 mV
    LTC3880-XF2-1.5v-CH1      1501 mV
    LTC3880-XF2-1.0v-RAIL     1030 mV
    LTC3880-XF2-1.0v-CH0      1030 mV
    LTC3880-XF2-1.0v-CH1      1033 mV
    LTC3880-XF1-1.5v-RAIL     1499 mV
    LTC3880-XF1-1.5v-CH0      1499 mV
    LTC3880-XF1-1.5v-CH1      1500 mV
    LTC3880-XF1-1.0v-RAIL     1029 mV
    LTC3880-XF1-1.0v-CH0      1029 mV
    LTC3880-XF1-1.0v-CH1      1033 mV
    LTC3880-XF0-1.5v-RAIL     1500 mV
    LTC3880-XF0-1.5v-CH0      1500 mV
```

```
    LTC3880-XF0-1.5v-CH1      1501 mV
    LTC3880-XF0-1.0v-RAIL     1030 mV
    LTC3880-XF0-1.0v-CH0      1030 mV
    LTC3880-XF0-1.0v-CH1      1033 mV
    LTC3880-3.3v-RAIL         3300 mV
    LTC3880-3.3v-CH0          3300 mV
    LTC3880-3.3v-CH1          3299 mV
SFB 2 status:
  State                      Online
  Intake-Zone0 Temperature   52 degrees C / 125 degrees F
  Exhaust-Zone1 Temperature  44 degrees C / 111 degrees F
  IntakeA-Zone0 Temperature  47 degrees C / 116 degrees F
  IntakeB-Zone1 Temperature  37 degrees C / 98 degrees F
  Exhaust-Zone0 Temperature  49 degrees C / 120 degrees F
  SFB-XF2-Zone1 Temperature  62 degrees C / 143 degrees F
  SFB-XF1-Zone0 Temperature  66 degrees C / 150 degrees F
  SFB-XF0-Zone0 Temperature  66 degrees C / 150 degrees F
  Power
    LTC3880-XF2-1.5v-RAIL     1499 mV
    LTC3880-XF2-1.5v-CH0      1499 mV
    LTC3880-XF2-1.5v-CH1      1500 mV
    LTC3880-XF2-1.0v-RAIL     1030 mV
    LTC3880-XF2-1.0v-CH0      1030 mV
    LTC3880-XF2-1.0v-CH1      1033 mV
    LTC3880-XF1-1.5v-RAIL     1500 mV
    LTC3880-XF1-1.5v-CH0      1500 mV
    LTC3880-XF1-1.5v-CH1      1501 mV
    LTC3880-XF1-1.0v-RAIL     1030 mV
    LTC3880-XF1-1.0v-CH0      1030 mV
    LTC3880-XF1-1.0v-CH1      1033 mV
    LTC3880-XF0-1.5v-RAIL     1499 mV
    LTC3880-XF0-1.5v-CH0      1499 mV
    LTC3880-XF0-1.5v-CH1      1501 mV
    LTC3880-XF0-1.0v-RAIL     1030 mV
    LTC3880-XF0-1.0v-CH0      1030 mV
    LTC3880-XF0-1.0v-CH1      1033 mV
    LTC3880-3.3v-RAIL         3300 mV
    LTC3880-3.3v-CH0          3300 mV
    LTC3880-3.3v-CH1          3299 mV
SFB 3 status:
  State                      Online
  Intake-Zone0 Temperature   53 degrees C / 127 degrees F
  Exhaust-Zone1 Temperature  44 degrees C / 111 degrees F
  IntakeA-Zone0 Temperature  48 degrees C / 118 degrees F
  IntakeB-Zone1 Temperature  38 degrees C / 100 degrees F
  Exhaust-Zone0 Temperature  49 degrees C / 120 degrees F
  SFB-XF2-Zone1 Temperature  62 degrees C / 143 degrees F
  SFB-XF1-Zone0 Temperature  65 degrees C / 149 degrees F
  SFB-XF0-Zone0 Temperature  68 degrees C / 154 degrees F
  Power
    LTC3880-XF2-1.5v-RAIL     1500 mV
    LTC3880-XF2-1.5v-CH0      1500 mV
    LTC3880-XF2-1.5v-CH1      1500 mV
    LTC3880-XF2-1.0v-RAIL     1029 mV
    LTC3880-XF2-1.0v-CH0      1029 mV
    LTC3880-XF2-1.0v-CH1      1033 mV
    LTC3880-XF1-1.5v-RAIL     1500 mV
    LTC3880-XF1-1.5v-CH0      1500 mV
    LTC3880-XF1-1.5v-CH1      1501 mV
    LTC3880-XF1-1.0v-RAIL     1030 mV
    LTC3880-XF1-1.0v-CH0      1030 mV
```

```
      LTC3880-XF1-1.0v-CH1      1033 mV
      LTC3880-XF0-1.5v-RAIL     1499 mV
      LTC3880-XF0-1.5v-CH0      1499 mV
      LTC3880-XF0-1.5v-CH1      1501 mV
      LTC3880-XF0-1.0v-RAIL     1030 mV
      LTC3880-XF0-1.0v-CH0      1030 mV
      LTC3880-XF0-1.0v-CH1      1034 mV
      LTC3880-3.3v-RAIL         3300 mV
      LTC3880-3.3v-CH0          3300 mV
      LTC3880-3.3v-CH1          3300 mV
  SFB 4 status:
    State                      Online
    Intake-Zone0 Temperature   54 degrees C / 129 degrees F
    Exhaust-Zone1 Temperature  46 degrees C / 114 degrees F
    IntakeA-Zone0 Temperature  49 degrees C / 120 degrees F
    IntakeB-Zone1 Temperature  39 degrees C / 102 degrees F
    Exhaust-Zone0 Temperature  50 degrees C / 122 degrees F
    SFB-XF2-Zone1 Temperature  61 degrees C / 141 degrees F
    SFB-XF1-Zone0 Temperature  64 degrees C / 147 degrees F
    SFB-XF0-Zone0 Temperature  67 degrees C / 152 degrees F
    Power
      LTC3880-XF2-1.5v-RAIL     1500 mV
      LTC3880-XF2-1.5v-CH0      1500 mV
      LTC3880-XF2-1.5v-CH1      1500 mV
      LTC3880-XF2-1.0v-RAIL     1030 mV
      LTC3880-XF2-1.0v-CH0      1030 mV
      LTC3880-XF2-1.0v-CH1      1033 mV
      LTC3880-XF1-1.5v-RAIL     1499 mV
      LTC3880-XF1-1.5v-CH0      1499 mV
      LTC3880-XF1-1.5v-CH1      1501 mV
      LTC3880-XF1-1.0v-RAIL     1030 mV
      LTC3880-XF1-1.0v-CH0      1030 mV
      LTC3880-XF1-1.0v-CH1      1033 mV
      LTC3880-XF0-1.5v-RAIL     1500 mV
      LTC3880-XF0-1.5v-CH0      1500 mV
      LTC3880-XF0-1.5v-CH1      1501 mV
      LTC3880-XF0-1.0v-RAIL     1030 mV
      LTC3880-XF0-1.0v-CH0      1030 mV
      LTC3880-XF0-1.0v-CH1      1033 mV
      LTC3880-3.3v-RAIL         3299 mV
      LTC3880-3.3v-CH0          3299 mV
      LTC3880-3.3v-CH1          3299 mV
  SFB 5 status:
    State                      Online
    Intake-Zone0 Temperature   54 degrees C / 129 degrees F
    Exhaust-Zone1 Temperature  46 degrees C / 114 degrees F
    IntakeA-Zone0 Temperature  49 degrees C / 120 degrees F
    IntakeB-Zone1 Temperature  40 degrees C / 104 degrees F
    Exhaust-Zone0 Temperature  50 degrees C / 122 degrees F
    SFB-XF2-Zone1 Temperature  63 degrees C / 145 degrees F
    SFB-XF1-Zone0 Temperature  65 degrees C / 149 degrees F
    SFB-XF0-Zone0 Temperature  70 degrees C / 158 degrees F
    Power
      LTC3880-XF2-1.5v-RAIL     1500 mV
      LTC3880-XF2-1.5v-CH0      1500 mV
      LTC3880-XF2-1.5v-CH1      1500 mV
      LTC3880-XF2-1.0v-RAIL     1029 mV
      LTC3880-XF2-1.0v-CH0      1029 mV
      LTC3880-XF2-1.0v-CH1      1033 mV
      LTC3880-XF1-1.5v-RAIL     1499 mV
      LTC3880-XF1-1.5v-CH0      1499 mV
```



```
    LTC3880-XF1-1.5v-CH1      1500 mV
    LTC3880-XF1-1.0v-RAIL     1030 mV
    LTC3880-XF1-1.0v-CH0      1030 mV
    LTC3880-XF1-1.0v-CH1      1033 mV
    LTC3880-XF0-1.5v-RAIL     1499 mV
    LTC3880-XF0-1.5v-CH0      1499 mV
    LTC3880-XF0-1.5v-CH1      1501 mV
    LTC3880-XF0-1.0v-RAIL     1029 mV
    LTC3880-XF0-1.0v-CH0      1029 mV
    LTC3880-XF0-1.0v-CH1      1033 mV
    LTC3880-3.3v-RAIL         3299 mV
    LTC3880-3.3v-CH0          3299 mV
    LTC3880-3.3v-CH1          3300 mV
SFB 6 status:
  State                      Online
  Intake-Zone0 Temperature   54 degrees C / 129 degrees F
  Exhaust-Zone1 Temperature  46 degrees C / 114 degrees F
  IntakeA-Zone0 Temperature  48 degrees C / 118 degrees F
  IntakeB-Zone1 Temperature  40 degrees C / 104 degrees F
  Exhaust-Zone0 Temperature  49 degrees C / 120 degrees F
  SFB-XF2-Zone1 Temperature  62 degrees C / 143 degrees F
  SFB-XF1-Zone0 Temperature  64 degrees C / 147 degrees F
  SFB-XF0-Zone0 Temperature  68 degrees C / 154 degrees F
  Power
    LTC3880-XF2-1.5v-RAIL     1499 mV
    LTC3880-XF2-1.5v-CH0      1499 mV
    LTC3880-XF2-1.5v-CH1      1501 mV
    LTC3880-XF2-1.0v-RAIL     1030 mV
    LTC3880-XF2-1.0v-CH0      1030 mV
    LTC3880-XF2-1.0v-CH1      1033 mV
    LTC3880-XF1-1.5v-RAIL     1499 mV
    LTC3880-XF1-1.5v-CH0      1499 mV
    LTC3880-XF1-1.5v-CH1      1500 mV
    LTC3880-XF1-1.0v-RAIL     1029 mV
    LTC3880-XF1-1.0v-CH0      1029 mV
    LTC3880-XF1-1.0v-CH1      1033 mV
    LTC3880-XF0-1.5v-RAIL     1499 mV
    LTC3880-XF0-1.5v-CH0      1499 mV
    LTC3880-XF0-1.5v-CH1      1501 mV
    LTC3880-XF0-1.0v-RAIL     1029 mV
    LTC3880-XF0-1.0v-CH0      1029 mV
    LTC3880-XF0-1.0v-CH1      1033 mV
    LTC3880-3.3v-RAIL         3300 mV
    LTC3880-3.3v-CH0          3300 mV
    LTC3880-3.3v-CH1          3300 mV
SFB 7 status:
  State                      Online
  Intake-Zone0 Temperature   53 degrees C / 127 degrees F
  Exhaust-Zone1 Temperature  46 degrees C / 114 degrees F
  IntakeA-Zone0 Temperature  49 degrees C / 120 degrees F
  IntakeB-Zone1 Temperature  40 degrees C / 104 degrees F
  Exhaust-Zone0 Temperature  50 degrees C / 122 degrees F
  SFB-XF2-Zone1 Temperature  64 degrees C / 147 degrees F
  SFB-XF1-Zone0 Temperature  66 degrees C / 150 degrees F
  SFB-XF0-Zone0 Temperature  69 degrees C / 156 degrees F
  Power
    LTC3880-XF2-1.5v-RAIL     1500 mV
    LTC3880-XF2-1.5v-CH0      1500 mV
    LTC3880-XF2-1.5v-CH1      1501 mV
    LTC3880-XF2-1.0v-RAIL     1029 mV
    LTC3880-XF2-1.0v-CH0      1029 mV
```



```
    LTC3880-XF2-1.0v-CH1       1033 mV
    LTC3880-XF1-1.5v-RAIL      1499 mV
    LTC3880-XF1-1.5v-CH0       1499 mV
    LTC3880-XF1-1.5v-CH1       1501 mV
    LTC3880-XF1-1.0v-RAIL      1030 mV
    LTC3880-XF1-1.0v-CH0       1030 mV
    LTC3880-XF1-1.0v-CH1       1033 mV
    LTC3880-XF0-1.5v-RAIL      1499 mV
    LTC3880-XF0-1.5v-CH0       1499 mV
    LTC3880-XF0-1.5v-CH1       1501 mV
    LTC3880-XF0-1.0v-RAIL      1030 mV
    LTC3880-XF0-1.0v-CH0       1030 mV
    LTC3880-XF0-1.0v-CH1       1033 mV
    LTC3880-3.3v-RAIL          3300 mV
    LTC3880-3.3v-CH0           3300 mV
    LTC3880-3.3v-CH1           3300 mV
```

show chassis environment sfb (MX2010 Router)

```
user@host> show chassis environment sfb
SFB 0 status:
  State                       Online
  Intake-Zone0 Temperature    31 degrees C / 87 degrees F
  Exhaust-Zone1 Temperature   22 degrees C / 71 degrees F
  IntakeA-Zone0 Temperature   21 degrees C / 69 degrees F
  IntakeB-Zone1 Temperature   16 degrees C / 60 degrees F
  Exhaust-Zone0 Temperature   23 degrees C / 73 degrees F
  SFB-XF2-Zone1 Temperature   30 degrees C / 86 degrees F
  SFB-XF1-Zone0 Temperature   28 degrees C / 82 degrees F
  SFB-XF0-Zone0 Temperature   38 degrees C / 100 degrees F
  Power
    LTC3880-XF2-1.5v-RAIL      1500 mV
    LTC3880-XF2-1.5v-CH0       1500 mV
    LTC3880-XF2-1.5v-CH1       1500 mV
    LTC3880-XF2-1.0v-RAIL       949 mV
    LTC3880-XF2-1.0v-CH0        949 mV
    LTC3880-XF2-1.0v-CH1        951 mV
    LTC3880-XF1-1.5v-RAIL      1499 mV
    LTC3880-XF1-1.5v-CH0       1499 mV
    LTC3880-XF1-1.5v-CH1       1500 mV
    LTC3880-XF1-1.0v-RAIL       949 mV
    LTC3880-XF1-1.0v-CH0        949 mV
    LTC3880-XF1-1.0v-CH1        951 mV
    LTC3880-XF0-1.5v-RAIL      1499 mV
    LTC3880-XF0-1.5v-CH0       1499 mV
    LTC3880-XF0-1.5v-CH1       1500 mV
    LTC3880-XF0-1.0v-RAIL      1029 mV
    LTC3880-XF0-1.0v-CH0       1029 mV
    LTC3880-XF0-1.0v-CH1       1032 mV
    LTC3880-3.3v-RAIL          3300 mV
    LTC3880-3.3v-CH0           3300 mV
    LTC3880-3.3v-CH1           3299 mV
SFB 1 status:
  State                       Online
  Intake-Zone0 Temperature    32 degrees C / 89 degrees F
  Exhaust-Zone1 Temperature   20 degrees C / 68 degrees F
  IntakeA-Zone0 Temperature   25 degrees C / 77 degrees F
  IntakeB-Zone1 Temperature   15 degrees C / 59 degrees F
  Exhaust-Zone0 Temperature   24 degrees C / 75 degrees F
  SFB-XF2-Zone1 Temperature   31 degrees C / 87 degrees F
  SFB-XF1-Zone0 Temperature   31 degrees C / 87 degrees F
  SFB-XF0-Zone0 Temperature   37 degrees C / 98 degrees F
  Power
```



```
    LTC3880-XF2-1.5v-RAIL     1499 mV
    LTC3880-XF2-1.5v-CH0      1499 mV
    LTC3880-XF2-1.5v-CH1      1500 mV
    LTC3880-XF2-1.0v-RAIL     1029 mV
    LTC3880-XF2-1.0v-CH0      1029 mV
    LTC3880-XF2-1.0v-CH1      1031 mV
    LTC3880-XF1-1.5v-RAIL     1499 mV
    LTC3880-XF1-1.5v-CH0      1499 mV
    LTC3880-XF1-1.5v-CH1      1500 mV
    LTC3880-XF1-1.0v-RAIL     1029 mV
    LTC3880-XF1-1.0v-CH0      1029 mV
    LTC3880-XF1-1.0v-CH1      1031 mV
    LTC3880-XF0-1.5v-RAIL     1500 mV
LTC3880-XF0-1.5v-CH0      1500 mV
    LTC3880-XF0-1.5v-CH1      1500 mV
    LTC3880-XF0-1.0v-RAIL     1029 mV
    LTC3880-XF0-1.0v-CH0      1029 mV
    LTC3880-XF0-1.0v-CH1      1032 mV
    LTC3880-3.3v-RAIL         3299 mV
    LTC3880-3.3v-CH0          3299 mV
    LTC3880-3.3v-CH1          3299 mV
SFB 2 status:
  State                      Online
  Intake-Zone0 Temperature   26 degrees C / 78 degrees F
  Exhaust-Zone1 Temperature  19 degrees C / 66 degrees F
  IntakeA-Zone0 Temperature  23 degrees C / 73 degrees F
  IntakeB-Zone1 Temperature  15 degrees C / 59 degrees F
  Exhaust-Zone0 Temperature  21 degrees C / 69 degrees F
  SFB-XF2-Zone1 Temperature  29 degrees C / 84 degrees F
  SFB-XF1-Zone0 Temperature  26 degrees C / 78 degrees F
  SFB-XF0-Zone0 Temperature  31 degrees C / 87 degrees F
  Power
    LTC3880-XF2-1.5v-RAIL     1500 mV
    LTC3880-XF2-1.5v-CH0      1500 mV
    LTC3880-XF2-1.5v-CH1      1500 mV
    LTC3880-XF2-1.0v-RAIL     1029 mV
    LTC3880-XF2-1.0v-CH0      1029 mV
    LTC3880-XF2-1.0v-CH1      1031 mV
    LTC3880-XF1-1.5v-RAIL     1499 mV
    LTC3880-XF1-1.5v-CH0      1499 mV
    LTC3880-XF1-1.5v-CH1      1500 mV
    LTC3880-XF1-1.0v-RAIL     1030 mV
    LTC3880-XF1-1.0v-CH0      1030 mV
    LTC3880-XF1-1.0v-CH1      1031 mV
    LTC3880-XF0-1.5v-RAIL     1499 mV
    LTC3880-XF0-1.5v-CH0      1499 mV
    LTC3880-XF0-1.5v-CH1      1500 mV
    LTC3880-XF0-1.0v-RAIL     1029 mV
    LTC3880-XF0-1.0v-CH0      1029 mV
    LTC3880-XF0-1.0v-CH1      1032 mV
    LTC3880-3.3v-RAIL         3300 mV
    LTC3880-3.3v-CH0          3300 mV
    LTC3880-3.3v-CH1          3300 mV
SFB 3 status:
  State                      Offline
  Reason                         No power
SFB 4 status:
  State                      Online
  Intake-Zone0 Temperature   33 degrees C / 91 degrees F
  Exhaust-Zone1 Temperature  21 degrees C / 69 degrees F
  IntakeA-Zone0 Temperature  24 degrees C / 75 degrees F
```

```
  IntakeB-Zone1 Temperature  17 degrees C / 62 degrees F
  Exhaust-Zone0 Temperature  24 degrees C / 75 degrees F
  SFB-XF2-Zone1 Temperature  32 degrees C / 89 degrees F
  SFB-XF1-Zone0 Temperature  32 degrees C / 89 degrees F
  SFB-XF0-Zone0 Temperature  37 degrees C / 98 degrees F
  Power
    LTC3880-XF2-1.5v-RAIL     1499 mV
    LTC3880-XF2-1.5v-CH0      1499 mV
 LTC3880-XF2-1.5v-CH1      1500 mV
    LTC3880-XF2-1.0v-RAIL      949 mV
    LTC3880-XF2-1.0v-CH0       949 mV
    LTC3880-XF2-1.0v-CH1       952 mV
    LTC3880-XF1-1.5v-RAIL     1500 mV
    LTC3880-XF1-1.5v-CH0      1500 mV
    LTC3880-XF1-1.5v-CH1      1500 mV
    LTC3880-XF1-1.0v-RAIL     1029 mV
    LTC3880-XF1-1.0v-CH0      1029 mV
    LTC3880-XF1-1.0v-CH1      1031 mV
    LTC3880-XF0-1.5v-RAIL     1499 mV
    LTC3880-XF0-1.5v-CH0      1499 mV
    LTC3880-XF0-1.5v-CH1      1500 mV
    LTC3880-XF0-1.0v-RAIL      949 mV
    LTC3880-XF0-1.0v-CH0       949 mV
    LTC3880-XF0-1.0v-CH1       952 mV
    LTC3880-3.3v-RAIL         3299 mV
    LTC3880-3.3v-CH0          3299 mV
    LTC3880-3.3v-CH1          3299 mV
SFB 5 status:
  State                      Online
  Intake-Zone0 Temperature   27 degrees C / 80 degrees F
  Exhaust-Zone1 Temperature  20 degrees C / 68 degrees F
  IntakeA-Zone0 Temperature  23 degrees C / 73 degrees F
  IntakeB-Zone1 Temperature  15 degrees C / 59 degrees F
  Exhaust-Zone0 Temperature  22 degrees C / 71 degrees F
  SFB-XF2-Zone1 Temperature  27 degrees C / 80 degrees F
  SFB-XF1-Zone0 Temperature  34 degrees C / 93 degrees F
  SFB-XF0-Zone0 Temperature  32 degrees C / 89 degrees F
  Power
    LTC3880-XF2-1.5v-RAIL     1500 mV
    LTC3880-XF2-1.5v-CH0      1500 mV
    LTC3880-XF2-1.5v-CH1      1500 mV
    LTC3880-XF2-1.0v-RAIL      949 mV
    LTC3880-XF2-1.0v-CH0       949 mV
    LTC3880-XF2-1.0v-CH1       951 mV
    LTC3880-XF1-1.5v-RAIL     1499 mV
    LTC3880-XF1-1.5v-CH0      1499 mV
    LTC3880-XF1-1.5v-CH1      1500 mV
    LTC3880-XF1-1.0v-RAIL      949 mV
    LTC3880-XF1-1.0v-CH0       949 mV
    LTC3880-XF1-1.0v-CH1       951 mV
    LTC3880-XF0-1.5v-RAIL     1499 mV
    LTC3880-XF0-1.5v-CH0      1499 mV
    LTC3880-XF0-1.5v-CH1      1500 mV
    LTC3880-XF0-1.0v-RAIL     1029 mV
    LTC3880-XF0-1.0v-CH0      1029 mV
    LTC3880-XF0-1.0v-CH1      1032 mV
    LTC3880-3.3v-RAIL         3299 mV
    LTC3880-3.3v-CH0          3299 mV
    LTC3880-3.3v-CH1          3299 mV
SFB 6 status:
  State                      Online
```



```
  Intake-Zone0 Temperature   32 degrees C / 89 degrees F
  Exhaust-Zone1 Temperature  19 degrees C / 66 degrees F
  IntakeA-Zone0 Temperature  24 degrees C / 75 degrees F
 IntakeB-Zone1 Temperature  15 degrees C / 59 degrees F
  Exhaust-Zone0 Temperature  25 degrees C / 77 degrees F
  SFB-XF2-Zone1 Temperature  29 degrees C / 84 degrees F
  SFB-XF1-Zone0 Temperature  37 degrees C / 98 degrees F
  SFB-XF0-Zone0 Temperature  39 degrees C / 102 degrees F
  Power
    LTC3880-XF2-1.5v-RAIL     1500 mV
    LTC3880-XF2-1.5v-CH0      1500 mV
    LTC3880-XF2-1.5v-CH1      1500 mV
    LTC3880-XF2-1.0v-RAIL     1029 mV
    LTC3880-XF2-1.0v-CH0      1029 mV
    LTC3880-XF2-1.0v-CH1      1031 mV
    LTC3880-XF1-1.5v-RAIL     1499 mV
    LTC3880-XF1-1.5v-CH0      1499 mV
    LTC3880-XF1-1.5v-CH1      1500 mV
    LTC3880-XF1-1.0v-RAIL      949 mV
    LTC3880-XF1-1.0v-CH0       949 mV
    LTC3880-XF1-1.0v-CH1       951 mV
    LTC3880-XF0-1.5v-RAIL     1499 mV
    LTC3880-XF0-1.5v-CH0      1499 mV
    LTC3880-XF0-1.5v-CH1      1500 mV
    LTC3880-XF0-1.0v-RAIL     1029 mV
    LTC3880-XF0-1.0v-CH0      1029 mV
    LTC3880-XF0-1.0v-CH1      1032 mV
    LTC3880-3.3v-RAIL         3300 mV
    LTC3880-3.3v-CH0          3300 mV
    LTC3880-3.3v-CH1          3299 mV
SFB 7 status:
  State                      Online
  Intake-Zone0 Temperature   31 degrees C / 87 degrees F
  Exhaust-Zone1 Temperature  18 degrees C / 64 degrees F
  IntakeA-Zone0 Temperature  20 degrees C / 68 degrees F
  IntakeB-Zone1 Temperature  13 degrees C / 55 degrees F
  Exhaust-Zone0 Temperature  22 degrees C / 71 degrees F
  SFB-XF2-Zone1 Temperature  27 degrees C / 80 degrees F
  SFB-XF1-Zone0 Temperature  26 degrees C / 78 degrees F
  SFB-XF0-Zone0 Temperature  39 degrees C / 102 degrees F
  Power
    LTC3880-XF2-1.5v-RAIL     1499 mV
    LTC3880-XF2-1.5v-CH0      1499 mV
    LTC3880-XF2-1.5v-CH1      1500 mV
    LTC3880-XF2-1.0v-RAIL     1029 mV
    LTC3880-XF2-1.0v-CH0      1029 mV
    LTC3880-XF2-1.0v-CH1      1031 mV
    LTC3880-XF1-1.5v-RAIL     1499 mV
    LTC3880-XF1-1.5v-CH0      1499 mV
    LTC3880-XF1-1.5v-CH1      1500 mV
    LTC3880-XF1-1.0v-RAIL     1029 mV
    LTC3880-XF1-1.0v-CH0      1029 mV
    LTC3880-XF1-1.0v-CH1      1031 mV
    LTC3880-XF0-1.5v-RAIL     1500 mV
    LTC3880-XF0-1.5v-CH0      1500 mV
    LTC3880-XF0-1.5v-CH1      1500 mV
    LTC3880-XF0-1.0v-RAIL     1029 mV
    LTC3880-XF0-1.0v-CH0      1029 mV
    LTC3880-XF0-1.0v-CH1      1031 mV
    LTC3880-3.3v-RAIL         3300 mV
    LTC3880-3.3v-CH0          3300 mV
```



```
LTC3880-3.3v-CH1          3299 mV
```

show chassis environment sfm

Syntax

show chassis environment sfm
<*slot*>

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

none—Display environmental information about all SFMs.

slot—(Optional) Display environmental information about an individual SFM. Replace ***slot*** with a value from **0** through **3**.

Required Privilege Level

view

Related Documentation

- request chassis sfm on page 413
- request chassis sfm master switch on page 412
- Configuring SFM Redundancy on M40e and M160 Routers
- Switching the Global Master and Backup Roles in a Virtual Chassis Configuration

List of Sample Output

show chassis environment sfm (M40e Router) on page 617
show chassis environment sfm (M160 Router) on page 617

Output Fields

Table 44 on page 615 lists the output fields for the **show chassis environment sfm** command. Output fields are listed in the approximate order in which they appear.

Table 44: 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	Status of the SFM: • **Online**—SFM is online and running. • **Offline**—SFM is powered down. If two SFMs are installed and online, one is functioning as the master, and the other is marked as the **Standby**.
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 44: 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

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
<lcc *number*| sfc *number*>
<*slot*>
<f13 *sib-slot*>
<f2s *sib-slot/sib-f2s-slot-number*>

Release Information

Command introduced before Junos OS Release 7.4.
sfc option introduced in Junos OS Release 9.6. for the TX Matrix Plus router.
Command introduced in Junos OS 12.1 for the PTX Series Packet Transport Switches.
Command introduced in Junos OS 12.1 for the T4000 Core Routers.

Description

(M320, T Series, TX Matrix, and TX Matrix Plus routers, and PTX Packet Transport Switches only) Display Switch Interface Boards (SIB) environmental information.

Options

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 T1600 routers.

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).

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**.

lcc ***number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display environmental information about the SIB in a specified T640 router (or line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display environmental information about the SIB in a specified T1600 router (or line-card chassis) that is connected to the TX Matrix Plus router. Replace ***number*** with a value from **0** through **4**.

scc—(TX Matrix routers only) (Optional) Display environmental information about the SIB in the TX Matrix router (or switch-card chassis).

sfc—(TX Matrix Plus routers only) (Optional) Display environmental information about the SIB in the TX Matrix Plus router (or switch-fabric chassis).

slot—(Optional) Display environmental information about the specified SIB. For the M320 router, replace ***slot*** with a value from **0** through **3**. For the T640, T1600, T4000, and

TX Matrix routers, replace ***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 ***slot*** with a value from **0** through **2**. For the PTX5000 Packet Transport Switch, replace ***slot*** with a value from **0** through **8**.

Required Privilege Level view

Related Documentation

- request chassis sib on page 414
- show chassis sibs on page 1055
- Configuring the Junos OS to Upgrade and Downgrade Switch Interface Boards on a TX Matrix Router on page 58
- M320 SIB Description

List of Sample Output

show chassis environment sib (M320 Router) on page 622
show chassis environment sib 1 (T640 Router) on page 622
show chassis environment sib 1 (T4000 Router) on page 623
show chassis environment sib scc (TX Matrix Router) on page 623
show chassis environment sib (TX Matrix Plus Router) on page 624
show chassis environment sib sfc (TX Matrix Plus Router) on page 634
show chassis environment sib f13 (TX Matrix Plus Router) on page 640
show chassis environment sib f2s (TX Matrix Plus Router) on page 640
show chassis environment sib (PTX5000 Packet Transport Switch) on page 641

Output Fields Table 45 on page 620 lists the output fields for the **show chassis environment sib** command. Output fields are listed in the approximate order in which they appear.

Table 45: show chassis environment sib Output Fields

Field Name	Field Description
SIB slot status	SIB slot number: • **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 Switch.

Table 45: show chassis environment sib Output Fields *(continued)*

Field Name	Field Description
State	Status of the SIB: • **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. 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. Online standby (TX Matrix Plus router only).
Temperature	Temperature of the air flowing past the SIB. On PTX Series Packet Transport Switches, separate temperatures are displayed for **Intake**, **Exhaust**, and **Junction**.
Power	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.

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

```
user@host> show chassis environment sib
sfc0-re0:
--------------------------------------------------------------------------
```

(TX Matrix Plus Router)

```
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

```
user@host> show chassis environment sib sfc
sfc0-re0:
--------------------------------------------------------------------------
```


(TX Matrix Plus Router)

```
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

```
user@host> show chassis environment sib f2s 0/2
SIB F2S 0/2 status:
  State                     Online - Standby
```

(TX Matrix Plus Router)

```
  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

```
user@host> show chassis environment sib
SIB 0 status:
  State                       Online
```


(PTX5000 Packet Transport Switch)

```
    Intake Temperature          39 degrees C / 102 degrees F
    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
    Intake Temperature          39 degrees C / 102 degrees F
    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
    Intake Temperature          37 degrees C / 98 degrees F
    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
    Intake Temperature          40 degrees C / 104 degrees F
    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
    Intake Temperature          47 degrees C / 116 degrees F
    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
  Intake Temperature         57 degrees C / 134 degrees F
  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
  Intake Temperature         57 degrees C / 134 degrees F
  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
  Intake Temperature         58 degrees C / 136 degrees F
  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
  Intake Temperature         57 degrees C / 134 degrees F
  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

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 3D Universal Edge Routers)

show chassis ethernet-switch
<errors <*port*> | statistics <*port*>>

Syntax (MX2020 3D Universal Edge Routers)

show chassis ethernet-switch
<errors <*port*> | statistics <*port*>>

Syntax (PTX Series Packet Transport Switches)

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 12.1 for PTX Series Packet Transport Switches.
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 switches 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 T1600 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 Switches, 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 and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display information about the ports on the CB's Ethernet switch on a specified T640 router (or line-card chassis) that is connected to a TX Matrix router. On a TX Matrix Plus router, display information about the ports on the CB's Ethernet switch on 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 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.

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 (or 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 Switches, 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

Output Fields

Table 46 on page 647 lists the output fields for the **show chassis ethernet-switch** command. Output fields are listed in the approximate order in which they appear.

Table 46: show chassis ethernet-switch Output Fields

Field Name	Field Description
Link is good on port n connected to device or **Link is good on Fast Ethernet port n connected to device** or **Link is good on Gigabit Ethernet port n connected to device** or **Link is down on Gigabit Ethernet port connected to device**	Information about the link between each port on the CB's Ethernet switch and one of the following devices: • 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) LCCO (line-card chassis 0) through LCC3
Speed is	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**. NOTE: Irrespective of the device, the speed is **1000** Mb on the MX2010 and MX2020 routers.
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 *Junos OS System Basics Configuration Guide*).
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 *n* connected to device FPC*n*: (error output only)	
Lock	Number of lock errors detected.
Xmit	Number of transmission errors detected.
ESD	Number of electrostatic discharge (ESD) errors detected.
False Carrier	Number of false carrier errors detected.

Table 46: show chassis ethernet-switch Output Fields *(continued)*

Field Name	Field Description
Disconnects	Number of disconnect errors detected.
FX mode	Number of errors detected on an Ethernet link over optical fiber.
Statistics for port *n* connected to device FPC*n* (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.
TX Mult. Collision frames	(MX2010 and MX2020 routers) Number of packets sent after multiple collisions.

Table 46: show chassis ethernet-switch Output Fields *(continued)*

Field Name	Field Description
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.
RX Packets 4096 - 9216 Octets	(MX2010 and MX2020 routers) Number of packets of size 4096 through 9216 octets received.

Table 46: show chassis ethernet-switch Output Fields *(continued)*

Field Name	Field Description
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 (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

```
user@host > show chassis ethernet-switch statistics
Displaying port statistics for switch 0
Statistics for port 0 connected to device FPC0:
```

statistics (MX2010 Router)

```
    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 Xmns      0
    TX Frame excessive deferl   0
    TX Oversize Packets         0
    TX Jabbers                  0
    TX FCS Error Counter        0
    TX Fragment Counter         0
    TX Byte Counter             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 Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             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 Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             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 Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             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 Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             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 Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             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 Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             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

```
user@host > show chassis ethernet-switch statistics
Displaying port statistics for switch 0
Statistics for port 0 connected to device FPC0:
```

statistics (MX2020 Router)

```
  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 Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             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 Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             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 Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             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 Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             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 Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
```

```
    TX FCS Error Counter       0
    TX Fragment Counter        0
    TX Byte Counter            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 Xmns     0
    TX Frame excessive deferl  0
    TX Oversize Packets        0
    TX Jabbers                 0
    TX FCS Error Counter       0
    TX Fragment Counter        0
    TX Byte Counter            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 Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             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 Xmns     0
  TX Frame excessive deferl  0
  TX Oversize Packets        0
  TX Jabbers                 0
  TX FCS Error Counter       0
  TX Fragment Counter        0
  TX Byte Counter            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 (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

```
user@host> show chassis ethernet-switch errors
sfc0-re0:
--------------------------------------------------------------------------
```

(TX Matrix Plus Router)

```
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

```
user@host> show chassis ethernet-switch errors switch sfc
sfc0-re0:
--------------------------------------------------------------------------
```


errors (TX Matrix Plus Router)

```
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

```
user@host> show chassis ethernet-switch statistics
sfc0-re0:
--------------------------------------------------------------------------
```

statistics (TX Matrix Plus Router)

```
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 Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             329291449
  RX Packets 64 Octets        5640175
  RX Packets 65-127 Octets    79875
  RX Packets 128-255 Octets   6338
  RX Packets 256-511 Octets   165
  RX Packets 512-1023 Octets  4317
  RX Packets 1024-1518 Octets  10
  RX Packets 1519-2047 Octets  0
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Octets                   5730880
  RX Multicast Packets        4
```



```
  RX Broadcast Packets        1735007
  RX FCS Errors               0
  RX Align Errors             0
  RX Fragments                0
  RX Symbol errors            0
  RX Unsupported opcodes      0
  RX Out of Range Length      0
  RX False Carrier Errors     0
  RX Undersize Packets        0
  RX Oversize Packets         0
  RX Jabbers                  0
  RX 1519-1522 Good Vlan frms 0
  RX MTU Exceed Counter       0
  RX Control Frame Counter    0
RX Pause Frame Counter      0
  RX Byte Counter             371282850
Statistics for port 18 connected to device SPMB:
  TX Packets 64 Octets        2990326
  TX Packets 65-127 Octets    8572
  TX Packets 128-255 Octets   4
  TX Packets 256-511 Octets   49
  TX Packets 512-1023 Octets  0
  TX Packets 1024-1518 Octets  10793
  TX Packets 1519-2047 Octets  0
  TX Packets 2048-4095 Octets  0
  TX Packets 4096-9216 Octets  0
  TX 1519-1522 Good Vlan frms  0
  TX Octets                   3009744
  TX Multicast Packets        20
  TX Broadcast Packets        2458322
  TX Single Collision frames  0
  TX Mult. Collision frames   0
  TX Late Collisions          0
  TX Excessive Collisions     0
  TX Collision frames         0
  TX PAUSEMAC Ctrl Frames     0
  TX MAC ctrl frames          0
  TX Frame deferred Xmns      0
  TX Frame excessive deferl   0
  TX Oversize Packets         0
  TX Jabbers                  0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             203712524
  RX Packets 64 Octets        873454
  RX Packets 65-127 Octets    8886
  RX Packets 128-255 Octets   44
  RX Packets 256-511 Octets   21862
  RX Packets 512-1023 Octets  2
  RX Packets 1024-1518 Octets  49912
  RX Packets 1519-2047 Octets  0
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Octets                   954160
  RX Multicast Packets        0
  RX Broadcast Packets        402369
  RX FCS Errors               0
  RX Align Errors             0
  RX Fragments                0
  RX Symbol errors            0
  RX Unsupported opcodes      0
```



```
  RX Out of Range Length      0
  RX False Carrier Errors     0
  RX Undersize Packets        0
  RX Oversize Packets         0
  RX Jabbers                  0
  RX 1519-1522 Good Vlan frms 0
  RX MTU Exceed Counter       0
  RX Control Frame Counter    0
  RX Pause Frame Counter      0
  RX Byte Counter             137941752
...
```

show chassis ethernet-switch (T4000 Router)

```
user@host> show chassis ethernet-switch
Displaying summary for switch 0
Link is good on GE port 6 connected to device: FPC0
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled
  False carrier sense count = 04

Link is good on GE port 9 connected to device: FPC3
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled
  False carrier sense count = 03

Link is good on GE port 11 connected to device: FPC5
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled
  False carrier sense count = 03

Link is good on GE port 12 connected to device: FPC6
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled
  False carrier sense count = 03

Link is good on GE port 14 connected to device: SPMB
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled

Link is good on GE port 18 connected to device: RE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Disabled

Link is good on GE port 19 connected to device: Other RE
  Speed is 1000Mb
  Duplex is full
  Autonegotiate is Enabled
```

show chassis ethernet-switch errors (T4000 Router)

```
user@host> show chassis ethernet-switch errors

Displaying error for switch 0
Accumulated error counts for port 6 connected to device FPC0:
  MLT3           0
  Lock           0
  Xmit           0
```

```
  ESD            0
  False carrier  4
  Disconnects    0
  FX mode        0
Accumulated error counts for port 9 connected to device FPC3:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
  False carrier  3
  Disconnects    0
  FX mode        0
Accumulated error counts for port 11 connected to device FPC5:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
  False carrier  3
  Disconnects    0
  FX mode        0
Accumulated error counts for port 12 connected to device FPC6:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
  False carrier  3
  Disconnects    0
  FX mode        0
Accumulated error counts for port 19 connected to device Other RE:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
  False carrier  0
  Disconnects    0
  FX mode        0
```

show chassis ethernet-switch

```
user@host> show chassis ethernet-switch
Displaying summary for switch 0
Link is good on XE port 2 connected to device: SPMB
```

(PTX5000 Packet Transport Switch)

```
  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

```
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
```

Packet Transport Switch)

```
  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 Switch)

```
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

Syntax

show chassis fan

Syntax (ACX4000 Series Router)

show chassis fan

Syntax (MX Series Router)

show chassis fan
<all-members>
<local>
<member *member-id*>

Syntax (T Series Routers)

show chassis fan

Syntax (MX2010 3D Universal Edge Router)

show chassis fan

Syntax (MX2020 3D Universal Edge Router)

show chassis fan

Syntax (QFabric Systems)

show chassis fan
<interconnect-device *name*>

Syntax (TX Matrix Router)

show chassis fan
<lcc *number* | scc>

Syntax (TX Matrix Plus Router)

show chassis fan
<lcc *number* | sfc *number*>

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 Switches.
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.

Description

(T Series routers, TX Matrix routers, TX Matrix Plus router, M120 routers, M320 routers, MX2010 routers, MX2020 routers, MX Series 3D Universal Edge Routers, QFX3008-I Interconnect devices, EX Series switches, and PTX Series Packet Transport Switches 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* with a value of 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 (or 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 T1600 router (or line-card chassis) that is connected to a TX Matrix Plus router. Replace number with a value from 0 through 3.

scc —(TX Matrix router only) (Optional) Display information about the fan tray and fans for the TX Matrix router (or switch-card chassis).

sfc ***number***—(TX Matrix Plus router only) (Optional) Display information about the fan tray and fans for the TX Matrix Plus router (or switch-fabric chassis). Replace number with 0.

Required Privilege Level view

List of Sample Output

show chassis fan on page 691
show chassis fan (QFabric Systems) on page 691
show chassis fan (EX Series Switches) on page 692
show chassis fan (T320 Router) on page 693
show chassis fan (T640 Router) on page 693
show chassis fan (T1600 Router) on page 693
show chassis fan (T4000 Core Router) on page 694
show chassis fan (TX Matrix Router) on page 694
show chassis fan (TX Matrix Plus Router) on page 695
show chassis fan (PTX5000 Packet Transport Switch) on page 696
show chassis fan (MX2010 Router) on page 697
show chassis fan (MX2020 Router) on page 697
show chassis fan (ACX4000 Router) on page 698

Output Fields Table 47 on page 689 lists the output fields for the **show chassis fan** command. Output fields are listed in the approximate order in which they appear.

Table 47: show chassis fan Output Fields

Field Name	Field Description
Item	Fan item identifier.

Table 47: show chassis fan Output Fields *(continued)*

Field Name	Field Description
Status	Status of the fan: • **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 router, 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 Switches only) Percentage of the fan speed being used.
Measurement	(T Series routers, TX Matrix routers, TX Matrix Plus router, MX Series 3D Universal Edge Routers, QFX3108 Interconnect devices, and EX Series switches only) Fan speed status based on different chassis cooling requirements: • Spinning at high speed • Spinning at intermediate speed • Spinning at normal speed • Spinning at low speed (except EX Series switches) (MX2010 routers, MX2020 routers, and PTX Series Packet Transport Switches only) Fan speed in revolutions per minute (RPM) for each fan in the fan tray.

Sample Output

show chassis fan

user@host> **show chassis fan**

```
user@host> show chassis fan
      Item                      Status   RPM     Measurement
      Top Tray Fan 1            OK       3790    Spinning at normal speed
      Top Tray Fan 2            OK       3769    Spinning at normal speed
      Top Tray Fan 3            OK       3769    Spinning at normal speed
      Top Tray Fan 4            OK       3790    Spinning at normal speed
      Top Tray Fan 5            OK       3790    Spinning at normal speed
      Top Tray Fan 6            OK       3769    Spinning at normal speed
      Top Tray Fan 7            OK       3790    Spinning at normal speed
      Top Tray Fan 8            OK       3769    Spinning at normal speed
      Top Tray Fan 9            OK       3769    Spinning at normal speed
      Top Tray Fan 10           OK       3790    Spinning at normal speed
      Top Tray Fan 11           OK       3790    Spinning at normal speed
      Top Tray Fan 12           OK       3769    Spinning at normal speed
      Bottom Tray Fan 1         OK       2880    Spinning at normal speed
      Bottom Tray Fan 2         OK       2912    Spinning at normal speed
      Bottom Tray Fan 3         OK       2928    Spinning at normal speed
      Bottom Tray Fan 4         OK       2896    Spinning at normal speed
      Bottom Tray Fan 5         OK       2896    Spinning at normal speed
      Bottom Tray Fan 6         OK       2928    Spinning at normal speed
```

show chassis fan (QFabric Systems)

user@host> **show chassis fan interconnect-device *interconnect1***

```
      Item                      Status   RPM     Measurement
      TFT 0 Fan 0               OK       2849    Spinning at normal speed
      TFT 0 Fan 1               OK       2821    Spinning at normal speed
      TFT 0 Fan 2               OK       2735    Spinning at normal speed
      TFT 0 Fan 3               OK       2815    Spinning at normal speed
      TFT 0 Fan 4               OK       2828    Spinning at normal speed
      TFT 0 Fan 5               OK       2863    Spinning at normal speed
      BFT 1 Fan 0               OK       2941    Spinning at normal speed
      BFT 1 Fan 1               OK       3008    Spinning at normal speed
      BFT 1 Fan 2               OK       3073    Spinning at normal speed
      BFT 1 Fan 3               OK       2925    Spinning at normal speed
      BFT 1 Fan 4               OK       2863    Spinning at normal speed
      BFT 1 Fan 5               OK       2933    Spinning at normal speed
      SFT 0 Fan 0 Rotor 0       OK       15472   Spinning at normal speed
      SFT 0 Fan 0 Rotor 1       OK       14477   Spinning at normal speed
      SFT 0 Fan 1 Rotor 0       OK       15561   Spinning at normal speed
      SFT 0 Fan 1 Rotor 1       OK       14210   Spinning at normal speed
      SFT 0 Fan 2 Rotor 0       OK       16167   Spinning at normal speed
      SFT 0 Fan 2 Rotor 1       OK       14248   Spinning at normal speed
      SFT 0 Fan 3 Rotor 0       OK       16463   Spinning at normal speed
      SFT 0 Fan 3 Rotor 1       OK       14099   Spinning at normal speed
      SFT 1 Fan 0 Rotor 0       OK       15083   Spinning at normal speed
      SFT 1 Fan 0 Rotor 1       OK       13533   Spinning at normal speed
      SFT 1 Fan 1 Rotor 0       OK       16071   Spinning at normal speed
      SFT 1 Fan 1 Rotor 1       OK       14400   Spinning at normal speed
      SFT 1 Fan 2 Rotor 0       OK       15517   Spinning at normal speed
      SFT 1 Fan 2 Rotor 1       OK       14210   Spinning at normal speed
      SFT 1 Fan 3 Rotor 0       OK       16413   Spinning at normal speed
      SFT 1 Fan 3 Rotor 1       OK       14400   Spinning at normal speed
      SFT 2 Fan 0 Rotor 0       OK       15297   Spinning at normal speed
      SFT 2 Fan 0 Rotor 1       OK       14634   Spinning at normal speed
      SFT 2 Fan 1 Rotor 0       OK       15561   Spinning at normal speed
      SFT 2 Fan 1 Rotor 1       OK       14285   Spinning at normal speed
```

```
SFT 2 Fan 2 Rotor 0        OK       15835    Spinning at normal speed
SFT 2 Fan 2 Rotor 1        OK       14400    Spinning at normal speed
SFT 2 Fan 3 Rotor 0        OK       15789    Spinning at normal speed
SFT 2 Fan 3 Rotor 1        OK       14323    Spinning at normal speed
SFT 3 Fan 0 Rotor 0        OK       16314    Spinning at normal speed
SFT 3 Fan 0 Rotor 1        OK       14876    Spinning at normal speed
SFT 3 Fan 1 Rotor 0        OK       15835    Spinning at normal speed
SFT 3 Fan 1 Rotor 1        OK       14323    Spinning at normal speed
SFT 3 Fan 2 Rotor 0        OK       16265    Spinning at normal speed
SFT 3 Fan 2 Rotor 1        OK       14594    Spinning at normal speed
SFT 3 Fan 3 Rotor 0        OK       16071    Spinning at normal speed
SFT 3 Fan 3 Rotor 1        OK       14323    Spinning at normal speed
SFT 4 Fan 0 Rotor 0        OK       15652    Spinning at normal speed
SFT 4 Fan 0 Rotor 1        OK       14438    Spinning at normal speed
SFT 4 Fan 1 Rotor 0        OK       16167    Spinning at normal speed
SFT 4 Fan 1 Rotor 1        OK       14555    Spinning at normal speed
SFT 4 Fan 2 Rotor 0        OK       16023    Spinning at normal speed
SFT 4 Fan 2 Rotor 1        OK       14361    Spinning at normal speed
SFT 4 Fan 3 Rotor 0        OK       16216    Spinning at normal speed
SFT 4 Fan 3 Rotor 1        OK       14438    Spinning at normal speed
SFT 5 Fan 0 Rotor 0        OK       15297    Spinning at normal speed
SFT 5 Fan 0 Rotor 1        OK       14173    Spinning at normal speed
SFT 5 Fan 1 Rotor 0        OK       15472    Spinning at normal speed
SFT 5 Fan 1 Rotor 1        OK       13846    Spinning at normal speed
SFT 5 Fan 2 Rotor 0        OK       15340    Spinning at normal speed
SFT 5 Fan 2 Rotor 1        OK       13917    Spinning at normal speed
SFT 5 Fan 3 Rotor 0        OK       15835    Spinning at normal speed
SFT 5 Fan 3 Rotor 1        OK       13917    Spinning at normal speed
SFT 6 Fan 0 Rotor 0        OK       15743    Spinning at normal speed
SFT 6 Fan 0 Rotor 1        OK       14594    Spinning at normal speed
SFT 6 Fan 1 Rotor 0        OK       16167    Spinning at normal speed
SFT 6 Fan 1 Rotor 1        OK       14634    Spinning at normal speed
SFT 6 Fan 2 Rotor 0        OK       16167    Spinning at normal speed
SFT 6 Fan 2 Rotor 1        OK       14516    Spinning at normal speed
SFT 6 Fan 3 Rotor 0        OK       16666    Spinning at normal speed
SFT 6 Fan 3 Rotor 1        OK       14438    Spinning at normal speed
SFT 7 Fan 0 Rotor 0        OK       15517    Spinning at normal speed
SFT 7 Fan 0 Rotor 1        OK       14438    Spinning at normal speed
SFT 7 Fan 1 Rotor 0        OK       15517    Spinning at normal speed
SFT 7 Fan 1 Rotor 1        OK       14361    Spinning at normal speed
SFT 7 Fan 2 Rotor 0        OK       16167    Spinning at normal speed
SFT 7 Fan 2 Rotor 1        OK       14555    Spinning at normal speed
SFT 7 Fan 3 Rotor 0        OK       15697    Spinning at normal speed
SFT 7 Fan 3 Rotor 1        OK       14361    Spinning at normal speed
```

show chassis fan (EX Series Switches)

user@host> **show chassis fan**

```
Item                       Status   RPM      Measurement
Fan 1                      OK       3477     Spinning at normal speed
Fan 2                      OK       3477     Spinning at normal speed
Fan 3                      OK       3479     Spinning at normal speed
Fan 4                      OK       3508     Spinning at normal speed
Fan 5                      OK       3517     Spinning at normal speed
Fan 6                      OK       3531     Spinning at normal speed
Fan 7                      OK       3439     Spinning at normal speed
Fan 8                      OK       3424     Spinning at normal speed
Fan 9                      OK       3413     Spinning at normal speed
Fan 10                     OK       3439     Spinning at normal speed
Fan 11                     OK       3446     Spinning at normal speed
Fan 12                     OK       3432     Spinning at normal speed
```


show chassis fan (T320 Router)

```
user@host> show chassis fan

      Item                   Status    RPM     Measurement
 Top Left Front fan           OK       2850    Spinning at normal speed
 Top Left Middle fan          OK       2820    Spinning at normal speed
 Top Left Rear fan            OK       2970    Spinning at normal speed
 Top Right Front fan          OK       2790    Spinning at normal speed
 Top Right Middle fan         OK       2640    Spinning at normal speed
 Top Right Rear fan           OK       2790    Spinning at normal speed
 Bottom Left Front fan        OK       2520    Spinning at normal speed
 Bottom Left Middle fan       OK       2610    Spinning at normal speed
 Bottom Left Rear fan         OK       2550    Spinning at normal speed
 Bottom Right Front fan       OK       2610    Spinning at normal speed
 Bottom Right Middle fan      OK       2880    Spinning at normal speed
 Bottom Right Rear fan        OK       2790    Spinning at normal speed
 Rear Tray Top fan            OK       2130    Spinning at normal speed
 Rear Tray Second fan         OK       2190    Spinning at normal speed
 Rear Tray Middle fan         OK       2250    Spinning at normal speed
 Rear Tray Fourth fan         OK       2220    Spinning at normal speed
 Rear Tray Bottom fan         OK       2280    Spinning at normal speed
```

show chassis fan (T640 Router)

```
user@host> show chassis fan

    Item                     Status    RPM     Measurement
 Top Left Front fan           OK       3420    Spinning at normal speed
 Top Left Middle fan          OK       3420    Spinning at normal speed
 Top Left Rear fan            OK       3420    Spinning at normal speed
 Top Right Front fan          OK       3420    Spinning at normal speed
 Top Right Middle fan         OK       3420    Spinning at normal speed
 Top Right Rear fan           OK       3450    Spinning at normal speed
 Bottom Left Front fan        OK       3390    Spinning at normal speed
 Bottom Left Middle fan       OK       3420    Spinning at normal speed
 Bottom Left Rear fan         OK       3390    Spinning at normal speed
 Bottom Right Front fan       OK       3390    Spinning at normal speed
 Bottom Right Middle fan      OK       3390    Spinning at normal speed
 Bottom Right Rear fan        OK       3390    Spinning at normal speed
 Rear Tray Top fan            OK       5220    Spinning at normal speed
 Rear Tray Second fan         OK       5220    Spinning at normal speed
 Rear Tray Third fan          OK       5220    Spinning at normal speed
 Rear Tray Fourth fan         OK       5220    Spinning at normal speed
 Rear Tray Fifth fan          OK       5220    Spinning at normal speed
 Rear Tray Sixth fan          OK       5220    Spinning at normal speed
 Rear Tray Seventh fan        OK       5220    Spinning at normal speed
 Rear Tray Bottom fan         OK       5220    Spinning at normal speed
```

show chassis fan (T1600 Router)

```
user@host> show chassis fan

   Item                      Status    RPM     Measurement
 Top Left Front fan           OK       3420    Spinning at normal speed
 Top Left Middle fan          OK       3420    Spinning at normal speed
 Top Left Rear fan            OK       3450    Spinning at normal speed
 Top Right Front fan          OK       3420    Spinning at normal speed
 Top Right Middle fan         OK       3420    Spinning at normal speed
 Top Right Rear fan           OK       3390    Spinning at normal speed
 Bottom Left Front fan        OK       3420    Spinning at normal speed
 Bottom Left Middle fan       OK       3420    Spinning at normal speed
 Bottom Left Rear fan         OK       3390    Spinning at normal speed
 Bottom Right Front fan       OK       3390    Spinning at normal speed
```

```
Bottom Right Middle fan    OK       3420    Spinning at normal speed
Bottom Right Rear fan      OK       3390    Spinning at normal speed
Rear Tray Top fan          OK       5190    Spinning at normal speed
Rear Tray Second fan       OK       5190    Spinning at normal speed
Rear Tray Third fan        OK       5190    Spinning at normal speed
Rear Tray Fourth fan       OK       5190    Spinning at normal speed
Rear Tray Fifth fan        OK       5190    Spinning at normal speed
Rear Tray Sixth fan        OK       5190    Spinning at normal speed
Rear Tray Seventh fan      OK       5190    Spinning at normal speed
Rear Tray Bottom fan       OK       5190    Spinning at normal speed
```

show chassis fan (T4000 Core Router)

user@host> **show chassis fan**

```
Item                       Status   RPM     Measurement
Top Left Front fan         OK       5190    Spinning at high speed
Top Left Middle fan        OK       5220    Spinning at high speed
Top Left Rear fan          OK       5190    Spinning at high speed
Top Right Front fan        OK       5160    Spinning at high speed
Top Right Middle fan       OK       5190    Spinning at high speed
Top Right Rear fan         OK       5160    Spinning at high speed
Bottom Left Front fan      OK       6030    Spinning at high speed
Bottom Left Middle fan     OK       6090    Spinning at high speed
Bottom Left Rear fan       OK       6090    Spinning at high speed
Bottom Right Front fan     OK       6030    Spinning at high speed
Bottom Right Middle fan    OK       6060    Spinning at high speed
Bottom Right Rear fan      OK       6060    Spinning at high speed
Rear Tray Top fan          OK       10000   Spinning at high speed
Rear Tray Second fan       OK       10000   Spinning at high speed
Rear Tray Third fan        OK       10000   Spinning at high speed
Rear Tray Fourth fan       OK       10000   Spinning at high speed
Rear Tray Fifth fan        OK       10000   Spinning at high speed
Rear Tray Sixth fan        OK       10000   Spinning at high speed
Rear Tray Seventh fan      OK       10000   Spinning at high speed
Rear Tray Bottom fan       OK       10000   Spinning at high speed
```

show chassis fan (TX Matrix Router)

user@host> **show chassis fan**

```
scc-re0:
--------------------------------------------------------------------------
Item                       Status   RPM     Measurement
Top Left Front fan         OK       3420    Spinning at normal speed
Top Left Middle fan        OK       3390    Spinning at normal speed
Top Left Rear fan          OK       3420    Spinning at normal speed
Top Right Front fan        OK       3390    Spinning at normal speed
Top Right Middle fan       OK       3420    Spinning at normal speed
Top Right Rear fan         OK       3390    Spinning at normal speed
Bottom Left Front fan      OK       3420    Spinning at normal speed
Bottom Left Middle fan     OK       3450    Spinning at normal speed
Bottom Left Rear fan       OK       3420    Spinning at normal speed
Bottom Right Front fan     OK       3420    Spinning at normal speed
Bottom Right Middle fan    OK       3420    Spinning at normal speed
Bottom Right Rear fan      OK       3420    Spinning at normal speed
Rear Tray Top fan          OK       3420    Spinning at normal speed
Rear Tray Second fan       OK       5190    Spinning at normal speed
Rear Tray Third fan        OK       5190    Spinning at normal speed
Rear Tray Fourth fan       OK       5190    Spinning at normal speed
Rear Tray Fifth fan        OK       3420    Spinning at normal speed
Rear Tray Sixth fan        OK       3420    Spinning at normal speed
Rear Tray Seventh fan      OK       3420    Spinning at normal speed
Rear Tray Bottom fan       OK       3420    Spinning at normal speed
```

```
lcc2-re0:
--------------------------------------------------------------------------
      Item                      Status   RPM     Measurement
      Top Left Front fan        OK       3420    Spinning at normal speed
      Top Left Middle fan       OK       3420    Spinning at normal speed
      Top Left Rear fan         OK       3450    Spinning at normal speed
      Top Right Front fan       OK       3420    Spinning at normal speed
      Top Right Middle fan      OK       3450    Spinning at normal speed
      Top Right Rear fan        OK       3360    Spinning at normal speed
      Bottom Left Front fan     OK       3420    Spinning at normal speed
      Bottom Left Middle fan    OK       3480    Spinning at normal speed
      Bottom Left Rear fan      OK       3420    Spinning at normal speed
      Bottom Right Front fan    OK       3420    Spinning at normal speed
      Bottom Right Middle fan   OK       3390    Spinning at normal speed
      Bottom Right Rear fan     OK       3420    Spinning at normal speed
      Rear Tray Top fan         OK       3420    Spinning at normal speed
      Rear Tray Second fan      OK       3420    Spinning at normal speed
      Rear Tray Third fan       OK       3420    Spinning at normal speed
      Rear Tray Fourth fan      OK       3420    Spinning at normal speed
      Rear Tray Fifth fan       OK       3420    Spinning at normal speed
      Rear Tray Sixth fan       OK       3420    Spinning at normal speed
      Rear Tray Seventh fan     OK       3420    Spinning at normal speed
      Rear Tray Bottom fan      OK       3420    Spinning at normal speed
```

show chassis fan (TX Matrix Plus Router)

```
user@host> 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

lcc0-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 (PTX5000 Packet Transport Switch)

```
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 (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 fabric destinations

Syntax show chassis fabric destinations

Syntax (MX240, MX480, and MX960 Routers) show chassis fabric destinations fpc <*fpc-slot-number*>

Syntax (MX2020 3D Universal Edge Routers) show chassis fabric destinations fpc <*fpc-slot-number*>

Syntax (MX2010 3D Universal Edge Routers) show chassis fabric destinations fpc <*fpc-slot-number*>

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

List of Sample Output
show chassis fabric destinations fpc 1 (MX240 Router) on page 701
show chassis fabric destinations fpc 2 (MX480 Router) on page 701
show chassis fabric destinations (MX960 Router) on page 702
show chassis fabric destinations fpc 1 (MX2020 Router) on page 703
show chassis fabric destinations (MX2010 Router) on page 704

Output Fields Table 48 on page 699 lists the output fields for the **show chassis fabric destinations** command. Output fields are listed in the approximate order in which they appear.

Table 48: show chassis fabric destinations Output Fields

Field Name	Field Description
Fabric destinations state	Indicates the state of the fabric destinations: • **0**—Destination is non-existent. • **2**—Destination is enabled. • **3**—Destination is disabled.

Table 48: show chassis fabric destinations Output Fields *(continued)*

Field Name	Field Description
	• **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 quadrapule 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 (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
  Plane 1   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
  Plane 3   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
  Plane 5   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 6   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 7   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   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
  Plane 1   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
  Plane 3   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
  Plane 5   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 6   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 7   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   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
  Plane 1   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
  Plane 3   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
  Plane 5   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 6   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 7   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   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
  Plane 1   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
  Plane 3   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
  Plane 5   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 6   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 2222
  Plane 7   2222 2222 2222   2222 2222 2222   2222 2222 2222   2222 2222 2222
2222 2222 2222   2222 2222 2222   2222 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
  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 2
 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 3
 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
 PFE 2
  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 3
    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 4
  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
FPC 5
  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 6
  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
```



```
 PFE 2
  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 3
  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 7
 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 8
 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
FPC 9
 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
```


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 709

Output Fields Table 49 on page 709 lists the output fields for the **show chassis fabric feb** command.

Table 49: 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

Syntax

show chassis fabric errors
<fpc *slot-number* lcc *number*>
<sib (*slot* | f13 *sib-slot* | f2s *sib-slot/sib-f2s-slot-number* | lcc *number*)>

Syntax (PTX Series Packet Transport Switches)

show chassis fabric errors
(autoheal | fpc *slot-number* | sib *sib-slot*)

Release Information

Command introduced in Junos OS Release 10.0.
Command introduced in Junos OS Release 12.1X48 for the PTX Series Packet Transport Switches.

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—(PTX Series Packet Transport Switches 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 Switches only)—Replace ***slot-number*** with a value from **0** through **7**.

(TX Matrix Plus routers only)—Replace ***slot-number*** with a value from **0** through **31**. This option has the following suboptions:

- lcc ***number***—Show error log of the first ten and last ten errors for the specified FPC on a specific network device (or line-card chassis) that is part of the routing matrix. Replace ***number*** with a value from **0** through **3**.

  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)*sib-slot*—Specify a value ranging from **0** through **4**.
- (PTX Series Packet Transport Switches) *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 (or line-card chassis). Replace ***number*** with a value from **0** through **3**.

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 712
show chassis fabric errors (F2S SIB Errors on a TX Matrix Plus Router) on page 712
show chassis fabric errors (SIB Errors Specific to an LCC Connected to a TX Matrix Plus Router) on page 712
show chassis fabric errors (FPC Errors Specific to an LCC Connected to a TX Matrix Plus Router) on page 712
show chassis fabric errors fpc or sib (PTX Series Packet Transport Switches) on page 713
show chassis fabric errors autoheal (PTX Series Packet Transport Switches) on page 713

Output Fields Table 50 on page 711 lists the output fields for the **show chassis fabric errors** command. Output fields are listed in the approximate order in which they appear.

Table 50: show chassis fabric errors Output Fields

Field Name	Field Description
Time	Time the error was logged. (PTX Series Packet Transport Switches only) For the **autoheal** 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 50: 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: • 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 Switch only)—Range is 0 through 7.
sib slot number	(PTX Series Packet Transport Switches only)—Range is 0 through 8.
lcc number	Not supported on PTX Series Packet Transport Switches.

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

```
user@host> show chassis fabric errors fpc 5 lcc 0
```


Specific to an LCC Connected to a TX Matrix Plus Router)

```
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 fpc or sib (PTX Series Packet Transport Switches)

```
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
2012-01-06 15:34:33 PST       Link errs on PFE 0, FPC 0, Plane 2
```

show chassis fabric errors autoheal (PTX Series Packet Transport Switches)

```
user@host> show chassis fabric errors autoheal
Time                          Error log of first 100 errors
2012-04-13 10:35:48 PDT       Req: sib 2
2012-04-13 10:35:53 PDT       Action: SIB 2 (autohealing)
2012-04-13 10:35:54 PDT       Req: sib 3
2012-04-13 10:35:57 PDT       Action: SIB 3 (autohealing)
2012-04-13 10:35:59 PDT       Req: sib 5
2012-04-13 10:35:59 PDT       Action: SIB 5 (autohealing)
2012-04-13 10:37:01 PDT       Req: sib 2
2012-04-13 10:37:02 PDT       Denied: Sib 2 (time less than user configured)
2012-04-13 10:37:02 PDT       Set info: SIB 2 (skip autoheal)
2012-04-13 10:37:05 PDT       Clear info: SIB 2
```

show chassis fabric fpcs

Syntax show chassis fabric fpcs
<lcc *number*>

Syntax (MX Series Routers) show chassis fabric fpcs
<all-members>
<local>
<member *member-id*>

Syntax (MX2010 3D Universal Edge Routers) show chassis fabric fpcs

Syntax (MX2020 3D Universal Edge Routers) show chassis fabric fpcs

Syntax (T4000 Core Router) show chassis fabric fpcs

Syntax (PTX Series Packet Transport Switches) show chassis fabric fpcs <slot *fpc-slot*>

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.4 for EX Series switches.
Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Switches.
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 (M320, MX Series, and T Series routers, EX8200 switches, and PTX Series Packet Transport Switches only) Display the state of the electrical switch fabric links between the Flexible PIC Concentrators (FPCs) and the Switch Interface Boards (SIBs).

Options

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 T1600 routers connected to the TX Matrix Plus router.

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 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 (or 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 T1600 router (or line-card chassis) that is connected to the TX Matrix Plus router. Replace ***number*** with a value from **0** through **3**.

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 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

List of Sample Output

show chassis fabric fpcs (M320 Router) on page 717
show chassis fabric fpcs (MX240 Router) on page 717
show chassis fabric fpcs (MX480 Router) on page 717
show chassis fabric fpcs (MX960 Router) on page 718
show chassis fabric fpcs (MX240 with AS MLC Modular Carrier Card) on page 720
show chassis fabric fpcs (MX480 with AS MLC Modular Carrier Card) on page 720
show chassis fabric fpcs (MX960 with AS MLC Modular Carrier Card on page 721
show chassis fabric fpcs (MX2010 Router) on page 723
show chassis fabric fpcs (MX2020 Router) on page 726
show chassis fabric fpcs (T320 Router) on page 729
show chassis fabric fpcs (T640 Router) on page 729
show chassis fabric fpcs (TX Matrix Router) on page 730
show chassis fabric fpcs (T1600 Router) on page 731
show chassis fabric fpcs (T4000 Core Router) on page 732
show chassis fabric fpcs (TX Matrix Plus Router) on page 734
show chassis fabric fpcs lcc (TX Matrix Plus Router) on page 741
show chassis fabric fpcs (EX8200 Switch) on page 742
show chassis fabric fpcs (PTX Series Packet Transport Switches) on page 743

Output Fields

Table 51 on page 716 lists the output fields for the **show chassis fabric fpcs** command. Output fields are listed in the approximate order in which they appear.

Table 51: show chassis fabric fpcs Output Fields

Field Name	Field Description

Fabric management FPC state	Switching fabric link (link from SIB to FPC) state for each FPC:
	• **Unused**—FPC is not present.
	(On MX240 and MX480 routers with AS- MLC modular carrier card only) the fabric plane from the pair that share physical links (1 and 5, and 3 and 7) is inactive.
	• **Destination error on PFEs** ***list of PFE numbers***—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:
	  ◦ 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 Switches only)—The plane is disabled because of link errors detected at the FPC RX.
	• **Plane Disabled, Links Down** (PTX Series Packet Transport 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 Switches only)—The FPC CCL 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

In the following output, FPC 5 is the AS MLC modular carrier card (AS MCC).

```
user@host>show chassis fabric fpcs
```


MLC Modular Carrier Card)

```
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 (MX960 with AS

In the following output, FPC 5 is the AS MLC modular carrier card (AS MCC).

`user@host>`**show chassis fabric fpcs**

MLC Modular Carrier Card

```
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 (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      0    1    2    3    4    5    6    7
             8    9   10   11   12   13   14   15   16   17   18   19   20   21
    SIB #4
           Destination error on PFEs      0    1    2    3    4    5    6    7
             8    9   10   11   12   13   14   15   16   17   18   19   20   21
...
```

show chassis fabric fpcs (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      0    1    2    3    4    5    6    7
             8    9   10   11   12   13   14   15   16   17   18   19   20   21
    SIB #4
           Destination error on PFEs      0    1    2    3    4    5    6    7
             8    9   10   11   12   13   14   15   16   17   18   19   20   21
...
FPC #4
  PFE #0
    SIB #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 (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       0    1    2    3    4    5    6    7
             8    9   10   11   12   13   14   15   16   17   18   19   20   21
    SIB #4
           Destination error on PFEs       0    1    2    3    4    5    6    7
             8    9   10   11   12   13   14   15   16   17   18   19   20   21
```

show chassis fabric fpcs (T4000 Core Router)

```
Fabric management FPC state:
FPC #2
  PFE #0
    SIB #0
            Links ok
```



```
    SIB #1
            Plane enabled
    SIB #2
            Plane enabled
    SIB #3
            Plane enabled
    SIB #4
            Plane enabled
FPC #3
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Plane enabled
    SIB #2
            Plane enabled
    SIB #3
            Plane enabled
    SIB #4
            Plane enabled
FPC #5
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Plane enabled
    SIB #2
            Plane enabled
    SIB #3
            Plane enabled
    SIB #4
            Plane enabled
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Plane enabled
    SIB #2
            Plane enabled
    SIB #3
            Plane enabled
    SIB #4
            Plane enabled
FPC #6
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Plane enabled
    SIB #2
            Plane enabled
    SIB #3
            Plane enabled
    SIB #4
            Plane enabled
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Plane enabled
    SIB #2
```

```
            Plane enabled
    SIB #3
            Plane enabled
    SIB #4
            Plane enabled
```

show chassis fabric fpcs (TX Matrix Plus Router)

```
user@host> show chassis fabric fpcs
lcc0-re0:
--------------------------------------------------------------------------
Fabric management FPC state:
FPC #0
  PFE #1
    SIB #0
            Unused
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
FPC #2
  PFE #0
    SIB #0
            Unused
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
  PFE #1
    SIB #0
            Unused
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
FPC #3
  PFE #1
    SIB #2
           Plane enabled
    SIB #3
           Link error
           Destination error on PFEs     0    1    2    3    4    5    6    7
             8    9   10   11   12   13   14   15   16   17   18   19   20   21
    SIB #4
           Destination error on PFEs     0    1    2    3    4    5    6    7
             8    9   10   11   12   13   14   15   16   17   18   19   20   21
FPC #4
  PFE #0
    SIB #0
            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

lcc1-re0:
--------------------------------------------------------------------------
Fabric management FPC state:
FPC #2
    PFE #0
        SIB #0
                Links ok
```

```
      SIB #1
              Links ok
      SIB #2
              Links ok
      SIB #3
              Links ok
      SIB #4
              Links ok
    PFE #1
      SIB #0
              Links ok
      SIB #1
              Links ok
      SIB #2
              Links ok
      SIB #3
              Links ok
      SIB #4
              Links ok
  FPC #4
    PFE #0
      SIB #0
              Links ok
      SIB #1
              Links ok
      SIB #2
              Links ok
      SIB #3
              Links ok
      SIB #4
              Links ok
    PFE #1
      SIB #0
              Links ok
      SIB #1
              Links ok
      SIB #2
              Links ok
      SIB #3
              Destination error on PFEs     1    8    9   29   40   65   72   73

               93  104
      SIB #4
              Links ok
  FPC #6
    PFE #0
      SIB #0
              Links ok
      SIB #1
              Links ok
      SIB #2
              Links ok
      SIB #3
              Links ok
      SIB #4
              Links ok
    PFE #1
      SIB #0
              Links ok
      SIB #1
              Links ok
```



```
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
FPC #7
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok

lcc2-re0:
--------------------------------------------------------------------------
Fabric management FPC state:
FPC #0
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
FPC #2
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
  PFE #1
    SIB #0
            Links ok
    SIB #1
```



```
                Links ok
        SIB #2
                Links ok
        SIB #3
                Links ok
        SIB #4
                Links ok
    FPC #4
      PFE #0
        SIB #0
                Links ok
        SIB #1
                Links ok
        SIB #2
                Links ok
        SIB #3
                Links ok
        SIB #4
                Links ok
    FPC #5
      PFE #0
        SIB #0
                Links ok
        SIB #1
                Links ok
        SIB #2
                Links ok
        SIB #3
                Links ok
        SIB #4
                Links ok
      PFE #1
        SIB #0
                Links ok
        SIB #1
                Links ok
        SIB #2
                Links ok
        SIB #3
                Links ok
        SIB #4
                Links ok
    FPC #6
      PFE #0
        SIB #0
                Links ok
        SIB #1
                Links ok
        SIB #2
                Links ok
        SIB #3
                Links ok
        SIB #4
                Links ok
      PFE #1
        SIB #0
                Links ok
        SIB #1
                Links ok
        SIB #2
                Links ok
```



```
    SIB #3
            Links ok
    SIB #4
            Links ok
FPC #7
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok

lcc3-re0:
--------------------------------------------------------------------------
Fabric management FPC state:
FPC #0
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
FPC #2
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
```



```
                Links ok
    SIB #3
                Links ok
    SIB #4
                Links ok
FPC #4
  PFE #0
    SIB #0
                Links ok
    SIB #1
                Links ok
    SIB #2
                Links ok
    SIB #3
                Links ok
    SIB #4
                Links ok
  PFE #1
    SIB #0
                Links ok
    SIB #1
                Links ok
    SIB #2
                Links ok
    SIB #3
                Links ok
    SIB #4
                Links ok
FPC #5
  PFE #0
    SIB #0
                Links ok
    SIB #1
                Links ok
    SIB #2
                Links ok
    SIB #3
                Links ok
    SIB #4
                Links ok
  PFE #1
    SIB #0
                Links ok
    SIB #1
                Links ok
    SIB #2
                Links ok
    SIB #3
                Links ok
    SIB #4
                Links ok
FPC #6
  PFE #0
    SIB #0
                Links ok
    SIB #1
                Links ok
    SIB #2
                Links ok
    SIB #3
                Links ok
```



```
    SIB #4
            Links ok
  PFE #1
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
FPC #7
  PFE #0
    SIB #0
            Links ok
    SIB #1
            Links ok
    SIB #2
            Links ok
    SIB #3
            Links ok
    SIB #4
            Links ok
```

show chassis fabric fpcs lcc (TX Matrix Plus Router)

```
user@host> show chassis fabric fpcs lcc 0
lcc0-re1:
--------------------------------------------------------------------------
Fabric management FPC state:
FPC #3
  PFE #1
    SIB #2
           Plane enabled
    SIB #3
           Link error
           Destination error on PFEs      0    1    2    3    4    5    6    7
             8    9   10   11   12   13   14   15   16   17   18   19   20   21
    SIB #4
           Destination error on PFEs      0    1    2    3    4    5    6    7
             8    9   10   11   12   13   14   15   16   17   18   19   20   21
FPC #4
  PFE #0
    SIB #0 Links ok
    SIB #1 Links ok
    SIB #2 Links ok
    SIB #3 Links ok
    SIB #4 Links ok
  PFE #1
    SIB #0 Links ok
    SIB #1 Links ok
    SIB #2 Links ok
    SIB #3 Links ok
    SIB #4 Links ok
FPC #6
  PFE #0
    SIB #0 Links ok
    SIB #1 Links ok
    SIB #2 Links ok
    SIB #3 Links ok
    SIB #4 Links ok
```

```
  PFE #1
    SIB #0 Links ok
    SIB #1 Links ok
    SIB #2 Links ok
    SIB #3 Links ok
    SIB #4 Links ok
FPC #7
  PFE #0
    SIB #0 Links ok
    SIB #1 Links ok
    SIB #2 Links ok
    SIB #3 Links ok
    SIB #4 Links ok
```

show chassis fabric fpcs (EX8200 Switch)

```
user@host> show chassis fabric fpcs
Fabric management FPC state
FPC 6
  PFE #0
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Links ok
      Plane 5: Links ok
      Plane 6: Links ok
      Plane 7: Links ok
      Plane 8: Plane enabled
      Plane 9: Plane enabled
      Plane 10: Plane enabled
      Plane 11: Plane enabled
  PFE #1
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Links ok
      Plane 5: Links ok
      Plane 6: Links ok
      Plane 7: Links ok
      Plane 8: Plane enabled
      Plane 9: Plane enabled
      Plane 10: Plane enabled
      Plane 11: Plane enabled
FPC 7
  PFE #0
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
      Plane 3: Plane enabled
      Plane 4: Links ok
      Plane 5: Links ok
      Plane 6: Links ok
      Plane 7: Links ok
      Plane 8: Plane enabled
      Plane 9: Plane enabled
      Plane 10: Plane enabled
      Plane 11: Plane enabled
  PFE #1
      Plane 0: Plane enabled
      Plane 1: Plane enabled
      Plane 2: Plane enabled
```



```
Plane 3: Plane enabled
Plane 4: Links ok
Plane 5: Links ok
Plane 6: Links ok
Plane 7: Links ok
Plane 8: Plane enabled
Plane 9: Plane enabled
Plane 10: Plane enabled
Plane 11: Plane enabled
```

show chassis fabric fpcs (PTX Series Packet Transport Switches)

```
user@host> show chassis fabric fpcs slot 0
Fabric management FPC state:
FPC #0
    PFE #0
        SIB0_Fcore0 (plane  0)   Plane Enabled, Links OK
        SIB0_Fcore1 (plane  1)   Plane Enabled, Links OK
        SIB1_Fcore0 (plane  2)   Plane Disabled, Links Down
        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
        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 map

Syntax

show chassis fabric map
plane <*plane-number*>

Syntax (MX Series Router)

show chassis fabric map
<all-members>
<local>
<member *member-id*>
<plane *plane-number*>

Release Information

Command introduced in Junos OS Release 8.0.
Command introduced in Junos OS Release 9.4 for EX Series switches.

Description

(M120 and MX Series routers and EX8200 switches only) On the M120 router, display the state of the switching fabric map for connections from the Forwarding Engine Boards (FEBs) to the ports on the fabric planes, as interpreted by the fabric plane. On the MX Series router and the EX8200 switch, display the state of the switching fabric map for connections from each Packet Forwarding Engine on the Dense Port Concentrators (DPCs) to the ports on the fabric planes, as interpreted by the fabric plane. For information about the meaning of “fabric plane”, “DPCs”, and “SIBs” on the switches, see EX Series Switches Hardware and CLI Terminology Mapping.

Options

none—Display the switching fabric map state for the M120 or MX Series router or EX8200 switch.

all-members—(MX Series routers only) (Optional) Display the switching fabric map state for all the members of the Virtual Chassis configuration.

local—(MX Series routers only) (Optional) Display the switching fabric map state for the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display the switching fabric map state for the specified member of the Virtual Chassis configuration. Replace the ***member-id*** with a value of 0 or 1.

plane *plane-number*—(Optional) Display the state of the fabric link for the specified plane number.

- For the M120 router, replace ***plane-number*** with a value from 0 through 3.
- For the MX480 and MX240 routers, replace ***plane-number*** with a value from 0 through 7.
- For the MX960 router, replace ***plane-number*** with a value from 0 through 5.
- For the EX8208 switch, replace ***plane-number*** with a value from 0 through 11.
- For the EX8216 switch, replace ***plane-number*** with a value from 0 through 7.

Required Privilege Level

view

List of Sample Output

show chassis fabric map (M120 Router) on page 746
show chassis fabric map (MX Series Routers) on page 746
show chassis fabric map plane 1 (EX8200 Switch) on page 749

Output Fields

Table 52 on page 745 lists the output fields for the **show chassis fabric map** command. Output fields are listed in the approximate order in which they appear.

Table 52: 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:
	• **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:
	  ◦ 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
regress@tp-grande01> 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 plane

Syntax

show chassis fabric plane

Syntax (TX Matrix Plus Routers)

show chassis fabric plane
<detail | extensive | terse>
<lcc *number* | sfc *number*>

Syntax (MX Series Routers)

show chassis fabric plane
<detail | extensive | terse>
<all-members>
<local>
<member *member-id*>

Syntax (MX2010 3D Universal Edge Routers)

show chassis fabric plane

Syntax (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, 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 T1600 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 and T1600 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 TXP-F2S SIB.

extensive—(TX Matrix Plus and T1600 routers in a routing matrix, and MX Series routers only) (Optional) Display extensive output for the fabric management plane, including the state of the optical links between the F13 SIB on the TX Matrix Plus router and the TXP-T1600 SIB (ST-SIB-L) on the T1600 router.

terse—(TX Matrix Plus router 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 Plus router only) (Optional) T1600 router (LCC) 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 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 387
- show chassis fabric plane-location on page 790

List of Sample Output

Output Fields

Table 53 on page 753 lists the output fields for the **show chassis fabric plane** command. Output fields are listed in the approximate order in which they appear.

Table 53: show chassis fabric plane Output Fields

Field Name	Field Description	Level of output
Plane	(TX Matrix Plus, MX Series, and M120 routers and EX8200 switches only) Number of the plane.	none

Plane state	(MX Series and M120 routers and EX8200 switches only) State of each plane:
	• **ACTIVE**—SIB is operational and running.
	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.
	• **FAULTY**— SIB is in alarmed state where the SIB's plane is not operational for the following reasons:
	  • On-board fabric ASIC is not operational.
	  • Fiber optic connector faults.
	  • FPC connector faults.
	  • SIB midplane connector faults.
	(MX2010 and MX2020 Routers only) State of each plane:
	• **ACTIVE**—SFB is operational and running.
	• **OFFLINE**— SFB is in offline.
		none

FEB	(M120 routers only) FEB number and state of links to each FEB: • **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
FPC	(MX Series routers only) Slot number of each Dense Port Concentrator (DPC) or Flexible PIC Concentrator (FPC). An FPC occupies two DPC slots on an MX Series router. The interface corresponds to the lowest numbered DPC slot for which the FPC is installed.	none

Table 53: show chassis fabric plane Output Fields *(continued)*

Field Name	Field Description	Level of output
PFE	(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. • **Links ok**: Link between SIB and FPC is active. • **Link error**: Link between SIB and FPC is not operational. • **Unused**: No FPC is present. (On MX240 and MX480 routers with AS MLC modular carrier card) Indicates that the link between the fabric plane and the hardware link on the modular carrier card is not operational. (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. • **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
State	(TX Matrix Plus and T1600 routers in a routing matrix only)—State of the fabric plane: • **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: ◦ 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: ◦ 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
Uptime	(TX Matrix Plus and T1600 routers in a routing matrix only)—Time the fabric plane has been up and running.	none

Table 53: show chassis fabric plane Output Fields *(continued)*

Field Name	Field Description	Level of output
Fabric Management Plane State Output Fields for the show chassis fabric plane extensive Command on a TX Matrix Plus Router		

PLANE *number*	State of the fabric plane:
	• **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:
	  ◦ 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:
	  ◦ 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

Table 53: show chassis fabric plane Output Fields *(continued)*

Field Name	Field Description	Level of output

SIB F13/F2S ***slot-number***	State of the TXP-F13 SIB or TXP-F2S SIB:
	
	• **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:
	  ◦ 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

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 T1600 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***	State of the SIB on the LCC that is connected to the **Even** or **Odd** port on the TXP-F13 SIB faceplate: • **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**

Table 53: show chassis fabric plane Output Fields *(continued)*

Field Name	Field Description	Level of output
SG *number* Port *number*	State of the SG chip ports on the LCC: • **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 SIB.	**extensive**

Fabric Management SIB State Output Fields for the show chassis fabric plane extensive Command on a TX Matrix Plus Router

Table 53: show chassis fabric plane Output Fields *(continued)*

Field Name	Field Description	Level of output

SIB ***slot-number***	State of the SIBs on the T1600 router (LCC) in the routing matrix:
	• **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.
	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 only applicable 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:
	  ◦ 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 53: show chassis fabric plane Output Fields *(continued)*

Field Name	Field Description	Level of output
LCC SIB Link State	State of the LCC SIB link: • **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: • **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

In the following output, FPC 1 is the AS MLC modular carrier card (AS MCC).

```
user@host>show chassis fabric plane
```

MLC Modular Carrier Card)

```
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

In the following output, FPC 5 is the AS MLC modular carrier card (AS MCC).

`user@host>`**show chassis fabric plane**

MLC Modular Carrier Card)

```
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 (MX960 with

In the following output, FPC 1 is a modular carrier card.

`user@host>`**show chassis fabric plane**

AS-MLC Modular Carrier Card)

```
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 (TX Matrix Plus Router)

```
user@host> show chassis fabric plane
sfc0-re0:
--------------------------------------------------------------------------
Plane  State                Uptime
 0     Spare
 1     Online               1 hour, 11 minutes, 26 seconds
 2     Online               1 hour, 11 minutes, 25 seconds
 3     Online               1 hour, 11 minutes, 20 seconds
```



```
 4     Online              1 hour, 11 minutes, 12 seconds

lcc0-re0:
--------------------------------------------------------------------------
SIB    State               Uptime
 0     Spare
 1     Online              5 hours, 11 minutes, 39 seconds
 2     Online              5 hours, 11 minutes, 39 seconds
 3     Online              5 hours, 11 minutes, 39 seconds
 4     Online              5 hours, 11 minutes, 39 seconds

lcc1-re0:
--------------------------------------------------------------------------
SIB    State               Uptime
 0     Spare
 1     Online              5 hours, 11 minutes, 40 seconds
 2     Online              5 hours, 11 minutes, 40 seconds
 3     Online              5 hours, 11 minutes, 40 seconds
 4     Online              5 hours, 11 minutes, 40 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)

```
user@host > show chassis fabric plane extensive
sfc0-re0:
--------------------------------------------------------------------------
Fabric Management PLANE State:
PLANE 0:    Online
   SIB F13 0    :    Online
   SIB F13 1    :    Empty
   SIB F2S 0/0 :    Online
   SIB F2S 0/2 :    Online
   SIB F2S 0/4 :    Online
   SIB F2S 0/6 :    Online
   SIB F13 0 Even:
        LCC 0, SIB 0 : Links error
            SG 0
                Port 0    : Links ok
                Port 1    : Link error
                Port 2    : Link error crc saturated
                Port 3    : Link error crc saturated with optical errors
:
```

show chassis fabric plane terse (TX Matrix Plus Router)

```
user@host> show chassis fabric plane terse
sfc0-re0:
--------------------------------------------------------------------------
Plane  State                Uptime
 0     Spare
 1     Online               1 hour, 16 minutes, 14 seconds
 2     Online               1 hour, 16 minutes, 13 seconds
 3     Online               1 hour, 16 minutes, 8 seconds
 4     Online               1 hour, 16 minutes

lcc0-re0:
--------------------------------------------------------------------------
SIB    State                Uptime
 0     Spare
 1     Online               5 hours, 16 minutes, 27 seconds
 2     Online               5 hours, 16 minutes, 27 seconds
 3     Online               5 hours, 16 minutes, 27 seconds
 4     Online               5 hours, 16 minutes, 27 seconds

lcc1-re0:
--------------------------------------------------------------------------
SIB    State                Uptime
 0     Spare
 1     Online               5 hours, 16 minutes, 28 seconds
 2     Online               5 hours, 16 minutes, 28 seconds
 3     Online               5 hours, 16 minutes, 28 seconds
 4     Online               5 hours, 16 minutes, 28 seconds
```


show chassis fabric plane lcc (TX Matrix Plus Router)

```
user@host> show chassis fabric plane lcc 1
lcc1-re0:
--------------------------------------------------------------------------
SIB     State                   Uptime
 0      Spare
 1      Online                  5 hours, 17 minutes, 52 seconds
 2      Online                  5 hours, 17 minutes, 52 seconds
 3      Online                  5 hours, 17 minutes, 52 seconds
 4      Online                  5 hours, 17 minutes, 52 seconds
```

show chassis fabric plane sfc (TX Matrix Plus Router)

```
user@host> show chassis fabric plane sfc 0
sfc0-re0:
--------------------------------------------------------------------------
Plane   State                   Uptime
 0      Spare
 1      Online                  1 hour, 4 minutes, 43 seconds
 2      Online                  1 hour, 4 minutes, 38 seconds
 3      Online                  1 hour, 4 minutes, 35 seconds
 4      Online                  1 hour, 4 minutes, 33 seconds

lcc0-re0:
--------------------------------------------------------------------------
SIB     State                   Uptime
 0      Spare
 1      Online                  1 hour, 7 minutes, 24 seconds
 2      Online                  1 hour, 7 minutes, 24 seconds
 3      Online                  1 hour, 7 minutes, 24 seconds
 4      Online                  1 hour, 7 minutes, 24 seconds

lcc1-re0:
--------------------------------------------------------------------------
SIB     State                   Uptime
 0      Offline
 1      Online                  1 hour, 7 minutes, 22 seconds
 2      Online                  1 hour, 7 minutes, 22 seconds
 3      Online                  1 hour, 7 minutes, 22 seconds
 4      Online                  1 hour, 7 minutes, 22 seconds
```

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 extensive (TX Matrix Plus Router)

```
user@host> show chassis fabric plane extensive
sfc0-re0:
--------------------------------------------------------------------------
Fabric Management PLANE State:
PLANE 0:    Online
   SIB F13 0   :    Online
   SIB F13 1   :    Empty
   SIB F2S 0/0 :    Online
   SIB F2S 0/2 :    Online
   SIB F2S 0/4 :    Online
   SIB F2S 0/6 :    Online
   SIB F13 0 Even:
        LCC 0, 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 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:    Fault
   SIB F13 3   :    Fault
   SIB F13 4   :    Empty
   SIB F2S 1/0 :    Fault
   SIB F2S 1/2 :    Fault
   SIB F2S 1/4 :    Online
   SIB F2S 1/6 :    Online
   SIB F13 3 Even:
        LCC 0, SIB 1 : 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
...
lcc1-re1:
--------------------------------------------------------------------------
Fabric Management SIB State:
   SIB     0   :    Online
        LCC SIB Link State : 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     1   :    Fault
     LCC SIB Link State : Link error
        SG 0
            Port 0    : Link error
            Port 1    : Link error
            Port 2    : Link error
            Port 3    : Link error
        SG 1
            Port 0    : Link error
            Port 1    : Link error
            Port 2    : Link error
            Port 3    : Link error
        SG 2
            Port 0    : Link error
            Port 1    : Link error
            Port 2    : Link error
            Port 3    : Link error
        SG 3
            Port 0    : Link error
            Port 1    : Link error
            Port 2    : Link error
            Port 3    : Link error
SIB     2   :    Online
     LCC SIB Link State : 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     3   :    Check
     LCC SIB Link State : Link error
        SG 0
            Port 0    : Link error
            Port 1    : Link error
            Port 2    : Link error
```


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

Syntax

show chassis fabric plane-location

Syntax (MX Series Routers)

show chassis fabric plane-location
<all-members>
<local>
<member *member-id*>

Syntax (MX2010 3D Universal Edge Routers)

show chassis fabric plane-location

Syntax (MX2020 3D Universal Edge Routers)

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 12.1 for PTX Series Packet Transport Switches.
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, 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 EX Series Switches Hardware and CLI Terminology Mapping.

(TX Matrix Plus routers only) Display the SIB location of each fabric plane.

(PTX Series Packet Transport Switches only) Display the fabric plane location of each SIB.

(MX2010 and MX2020 Routers only) Display the fabric plane location of each Switch Fabric Board (SFB).

Options

all-members—(MX Series routers only) (Optional) Display the CB location of each fabric plane on the Routing Engines in all member routers in the Virtual Chassis configuration.

local—(MX Series routers only) (Optional) Display the CB location of each fabric plane on the Routing Engines in the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display the CB location of each fabric plane on the Routing Engines in the specified member in the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

Required Privilege Level

view

List of Sample Output

show chassis fabric plane-location (M120 Router) on page 791
show chassis fabric plane-location (MX240 and MX480 Routers) on page 791

show chassis fabric plane-location (MX960 Router) on page 792
show chassis fabric plane-location (MX2010 Router) on page 792
show chassis fabric plane-location (MX2020 Router) on page 792
show chassis fabric plane-location (TX Matrix Plus Router) on page 792
show chassis fabric plane-location (EX8200 Switch) on page 792
show chassis fabric plane-location (PTX Series Packet Transport Switches) on page 793

Output Fields

Table 54 on page 791 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 54: show chassis fabric plane-location Output Fields

Field Name	Field Description
Plane *n*	Plane number. (PTX Series Packet Transport Switches only) Plane numbers associated with the SIB. (MX2010 and MX2020 Routers only) Plane numbers associated with the SFB.
Control Board *n*	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.
LCC ST-SIB-L	(TX Matrix Plus routers only) Line-card chassis (LCC) SIB slot number.
SIB	(PTX Series Packet Transport Switches only) SIB number.
Switch Fabric Board *n*	(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

```
user@host> show chassis fabric plane-location
------------Fabric Plane Locations-------------
Plane 0                         Control Board 0
```

(MX240 and MX480 Routers)

```
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 (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 Switches)

```
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 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

- Detection and Corrective Actions of FPCs with Degraded Fabric on MX Series Routers on page 192
- Detection and Recovery of Fabric-Related Failures Caused by Traffic Black Holes on MX Series Routers on page 186
- Corrective Actions for Fabric Failures on MX Series Routers on page 189
- **redundancy-mode on page 340**
- Configuring Redundancy Fabric Mode for Active Control Boards on MX Series Routers on page 195

List of Sample Output **show chassis fabric redundancy-mode on page 794**

Output Fields Table 55 on page 794 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 55: 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

Command introduced before Junos OS Release 11.4.
Command introduced in Junos OS Release 12.1 for MX240, MX840, and MX960 routers.
Command introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Switches.

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

none—Display the state of fabric destination reachability for M320, MX240, MX480, MX960, T640, and T1600 routers, based on periodic reachability checks. Display the system's action phase sequences to stop blackholing and attempt healing, and the final resolution.

detail—(Optional) Display the details of the actions carried out by the system in the different action phases and the final resolution.

Required Privilege Level

view

Related Documentation

- show chassis fabric unreachable-destinations on page 830

List of Sample Output

show chassis fabric reachability on page 800
show chassis fabric reachability detail on page 800
show chassis fabric reachability (PTX5000 system) on page 801

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 56: show chassis fabric reachability Output Fields

Field Name	Field Description	Level of Output
Fabric reachability status	Display the reachability status of the fabric. • **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. • **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. • **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: • **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 56: show chassis fabric reachability Output Fields *(continued)*

Field Name	Field Description	Level of Output
Initial phase	Starting phase for the healing action. • **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. • **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. • **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. • **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 56: 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. • **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 56: 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	Status after the healing actions are performed. • **Unreachable destinations healed after *phase name***—The unreachable destinations are healed after the healing actions are performed. The phase name indicates the last healing phase. • **Unreachable destinations removed by FPCs *FPC number* offline**—The unreachable destinations are removed by turning the FPCs offline. • **Unreachable destinations present on FPC/PFE *FPC/PFE number***—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

```
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

```
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 sibs

Syntax

show chassis fabric sibs
<lcc *number* | scc>

Release Information

Command introduced before Junos OS Release 7.4.

Description

(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).

(M320, T640, T1600, and T4000 routers) Display the state of the electrical switch fabric link between the SIBs and the FPCs.

Options

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).

(M320, T640, T1600, and T4000 routers) Display the state of the electrical switch fabric link between the SIBs and the FPCs.

lcc *number*—(Optional) Display the switching fabric link state for the T640 SIBs on a specified T640 router (or line-card chassis) connected to a TX Matrix router. Replace ***number*** with a value from **0** through **3**.

scc—(Optional) Display the switching fabric link state for the TX-SIBs on the TX Matrix router (or switch-card chassis).

Required Privilege Level

view

Related Documentation

- request chassis sib on page 414
- show chassis sibs on page 1055
- Monitoring the SIBs
- Redundant SIBs Overview

List of Sample Output

Output Fields

Table 57 on page 803 lists the output fields for the **show chassis fabric sibs** command. Output fields are listed in the approximate order in which they appear.

Table 57: 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: • **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.

Plane state	Possible plane state of the M320 SIB, TX-SIB or T640 SIB:
	• **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.
	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.
	• **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:
	  ◦ 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 topology

Syntax

show chassis fabric topology
<lcc *number* | scc>
<*sib-slot*>

Syntax (TX Matrix Router)

show chassis fabric topology
<lcc *number* | scc>
<*sib-slot*>

Syntax (TX Matrix Plus Router)

show chassis fabric topology
<lcc *number* | sfc *number*>
<*sib-slot*>

Syntax (T4000 Core Router)

show chassis fabric topology
<*sib-slot*>

Syntax (PTX Series Packet Transport 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 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 T1600 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 Switches only) 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 T1600 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.

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 (or 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 T1600 router (or line-card chassis) that is connected to the TX Matrix Plus router. Replace ***number*** with a value from **0** through **3**.

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 TX Matrix Plus router (or 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 817
show chassis fabric topology lcc on page 819
show chassis fabric topology (TX Matrix Plus Router) on page 820
show chassis fabric topology sfc (TX Matrix Plus Router) on page 821
show chassis fabric topology lcc (TX Matrix Plus Router) on page 822
show chassis fabric topology (T4000 Core Router) on page 823
show chassis fabric topology (PTX Series Packet Transport Switches) on page 824

Output Fields

Table 58 on page 813 lists the output fields for the **show chassis fabric topology** command. Output fields are listed in the approximate order in which they appear.

Table 58: 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.

Table 58: show chassis fabric topology Output Fields *(continued)*

Field Name	Field Description

state	State of the fabric link:
	
	• **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:
	  ◦ On-board F-chip is not operational.
	  ◦ Fiber-optic connector faults.
	  ◦ FPC connector faults.
	  ◦ SIB midplane connector faults.
	
	NOTE: The following state descriptions are applicable only to PTX Series Packet Transport Switches.
	
	• **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:
	  ◦ FPC midplane connector failure.
	  ◦ SIB midplane connector failure.
	  ◦ CCL link CRC error.

Table 58: 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:
	• **VCSEL Status**—Optical (VCSEL channel) link status for the corresponding electrical (HSL2) link. The states include: ◦ **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 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 58: 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 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.

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:
--------------------------------------------------------------------------
   fchip (mode)
in-links                 state         out-links                state
-------------------------------------------------------------------
Sib #2 :
---------
SIB2_F0  (F1 ):
FPC0_T->SIB-L2_F0,00     DOWN       SIB-L2_F0,00->SIB-S2_F3,15 DOWN
FPC0_B->SIB-L2_F0,01     UP         SIB-L2_F0,01->SIB-S2_F3,11 DOWN
FPC1_T->SIB-L2_F0,02     DOWN       SIB-L2_F0,02->SIB-S2_F0,04 DOWN
FPC1_B->SIB-L2_F0,03     DOWN       SIB-L2_F0,03->SIB-S2_F0,00 DOWN
FPC2_T->SIB-L2_F0,04     DOWN       SIB-L2_F0,04->SIB-S2_F3,07 DOWN
FPC2_B->SIB-L2_F0,05     DOWN       SIB-L2_F0,05->SIB-S2_F3,03 DOWN
FPC3_T->SIB-L2_F0,06     DOWN       SIB-L2_F0,06->SIB-S2_F0,12 DOWN
FPC3_B->SIB-L2_F0,07     DOWN       SIB-L2_F0,07->SIB-S2_F0,08 DOWN
FPC4_T->SIB-L2_F0,08     DOWN       SIB-L2_F0,08->SIB-S2_F2,15 DOWN
FPC4_B->SIB-L2_F0,09     DOWN       SIB-L2_F0,09->SIB-S2_F2,11 DOWN
FPC5_T->SIB-L2_F0,10     DOWN       SIB-L2_F0,10->SIB-S2_F1,04 DOWN
FPC5_B->SIB-L2_F0,11     DOWN       SIB-L2_F0,11->SIB-S2_F1,00 DOWN
FPC6_T->SIB-L2_F0,12     DOWN       SIB-L2_F0,12->SIB-S2_F2,07 DOWN
FPC6_B->SIB-L2_F0,13     UP         SIB-L2_F0,13->SIB-S2_F2,03 DOWN
FPC7_T->SIB-L2_F0,14     DOWN       SIB-L2_F0,14->SIB-S2_F1,12 DOWN
FPC7_B->SIB-L2_F0,15     DOWN       SIB-L2_F0,15->SIB-S2_F1,08 DOWN
SIB2_F1  (F3 ):
SIB-S2_F0,00->SIB-L2_F1,00 UP       SIB-L2_F1,00->FPC7_B     DOWN
SIB-S2_F0,04->SIB-L2_F1,01 UP       SIB-L2_F1,01->FPC7_T     DOWN
SIB-S2_F3,11->SIB-L2_F1,02 UP       SIB-L2_F1,02->FPC6_B     DOWN
SIB-S2_F3,15->SIB-L2_F1,03 UP       SIB-L2_F1,03->FPC6_T     DOWN
SIB-S2_F0,08->SIB-L2_F1,04 UP       SIB-L2_F1,04->FPC5_B     DOWN
SIB-S2_F0,12->SIB-L2_F1,05 UP       SIB-L2_F1,05->FPC5_T     DOWN
SIB-S2_F3,03->SIB-L2_F1,06 UP       SIB-L2_F1,06->FPC4_B     DOWN
SIB-S2_F3,07->SIB-L2_F1,07 UP       SIB-L2_F1,07->FPC4_T     DOWN
SIB-S2_F1,00->SIB-L2_F1,08 UP       SIB-L2_F1,08->FPC3_B     DOWN
SIB-S2_F1,04->SIB-L2_F1,09 UP       SIB-L2_F1,09->FPC3_T     DOWN
SIB-S2_F2,11->SIB-L2_F1,10 UP       SIB-L2_F1,10->FPC2_B     DOWN
SIB-S2_F2,15->SIB-L2_F1,11 UP       SIB-L2_F1,11->FPC2_T     DOWN
SIB-S2_F1,08->SIB-L2_F1,12 UP       SIB-L2_F1,12->FPC1_B     DOWN
SIB-S2_F1,12->SIB-L2_F1,13 UP       SIB-L2_F1,13->FPC1_T     DOWN
SIB-S2_F2,03->SIB-L2_F1,14 UP       SIB-L2_F1,14->FPC0_B     DOWN
SIB-S2_F2,07->SIB-L2_F1,15 UP       SIB-L2_F1,15->FPC0_T     DOWN
Sib #4 :
---------
SIB4_F0  (F1 ):
FPC0_T->SIB-L4_F0,00     RESET      SIB-L4_F0,00->SIB-S4_F3,15 UP
FPC0_B->SIB-L4_F0,01     UP         SIB-L4_F0,01->SIB-S4_F3,11 UP
FPC1_T->SIB-L4_F0,02     RESET      SIB-L4_F0,02->SIB-S4_F0,04 UP
FPC1_B->SIB-L4_F0,03     RESET      SIB-L4_F0,03->SIB-S4_F0,00 UP
FPC2_T->SIB-L4_F0,04     RESET      SIB-L4_F0,04->SIB-S4_F3,07 UP
FPC2_B->SIB-L4_F0,05     RESET      SIB-L4_F0,05->SIB-S4_F3,03 UP
```

```
FPC3_T->SIB-L4_F0,06     RESET       SIB-L4_F0,06->SIB-S4_F0,12 UP
FPC3_B->SIB-L4_F0,07     RESET       SIB-L4_F0,07->SIB-S4_F0,08 UP
FPC4_T->SIB-L4_F0,08     RESET       SIB-L4_F0,08->SIB-S4_F2,15 UP
FPC4_B->SIB-L4_F0,09     RESET       SIB-L4_F0,09->SIB-S4_F2,11 UP
FPC5_T->SIB-L4_F0,10     RESET       SIB-L4_F0,10->SIB-S4_F1,04 UP
FPC5_B->SIB-L4_F0,11     RESET       SIB-L4_F0,11->SIB-S4_F1,00 UP
FPC6_T->SIB-L4_F0,12     RESET       SIB-L4_F0,12->SIB-S4_F2,07 UP
FPC6_B->SIB-L4_F0,13     UP          SIB-L4_F0,13->SIB-S4_F2,03 UP
FPC7_T->SIB-L4_F0,14     RESET       SIB-L4_F0,14->SIB-S4_F1,12 UP
FPC7_B->SIB-L4_F0,15     RESET       SIB-L4_F0,15->SIB-S4_F1,08 UP
SIB4_F1  (F3 ):
SIB-S4_F0,00->SIB-L4_F1,00 UP       SIB-L4_F1,00->FPC7_B    UP
SIB-S4_F0,04->SIB-L4_F1,01 UP       SIB-L4_F1,01->FPC7_T    UP
SIB-S4_F3,11->SIB-L4_F1,02 UP       SIB-L4_F1,02->FPC6_B    UP
SIB-S4_F3,15->SIB-L4_F1,03 UP       SIB-L4_F1,03->FPC6_T    UP
SIB-S4_F0,08->SIB-L4_F1,04 UP       SIB-L4_F1,04->FPC5_B    UP
SIB-S4_F0,12->SIB-L4_F1,05 UP       SIB-L4_F1,05->FPC5_T    UP
SIB-S4_F3,03->SIB-L4_F1,06 UP       SIB-L4_F1,06->FPC4_B    UP
SIB-S4_F3,07->SIB-L4_F1,07 UP       SIB-L4_F1,07->FPC4_T    UP
SIB-S4_F1,00->SIB-L4_F1,08 UP       SIB-L4_F1,08->FPC3_B    UP
SIB-S4_F1,04->SIB-L4_F1,09 UP       SIB-L4_F1,09->FPC3_T    UP
SIB-S4_F2,11->SIB-L4_F1,10 UP       SIB-L4_F1,10->FPC2_B    UP
SIB-S4_F2,15->SIB-L4_F1,11 UP       SIB-L4_F1,11->FPC2_T    UP
SIB-S4_F1,08->SIB-L4_F1,12 UP       SIB-L4_F1,12->FPC1_B    UP
SIB-S4_F1,12->SIB-L4_F1,13 UP       SIB-L4_F1,13->FPC1_T    UP
SIB-S4_F2,03->SIB-L4_F1,14 UP       SIB-L4_F1,14->FPC0_B    UP
SIB-S4_F2,07->SIB-L4_F1,15 UP       SIB-L4_F1,15->FPC0_T    UP
```

show chassis fabric topology (TX Matrix Plus Router)

```
user@host> show chassis fabric topology
sfc0-re0:
--------------------------------------------------------------------------

F13_SIB0
=========

Out-Links:
=========
SFC0_F13_SIB_00      -> LCC00_ST_SIB_L00               VCSEL    HSL2    HSL2
                                                       Status   Channel Status
==============================================================================
SF_30_00_FB_D(04,11) -> FPC0_T_SG(0,0,0)_FB_D(01,11)    OK       112     Up
SF_30_00_FB_D(04,10) -> FPC0_T_SG(0,0,1)_FB_D(01,10)    OK       112     Up
SF_30_00_FB_D(04,09) -> FPC0_T_SG(0,0,2)_FB_D(01,09)    OK       112     Up
SF_30_00_FB_D(04,08) -> FPC0_T_SG(0,0,3)_FB_D(01,08)    OK       112     Up
SF_30_00_FB_D(04,07) -> FPC0_T_SG(0,0,4)_FB_D(01,07)    OK       112     Up
SF_30_00_FB_D(04,06) -> FPC0_T_SG(0,0,5)_FB_D(01,06)    OK       112     Up
SF_30_00_FB_D(04,05) -> FPC0_T_SG(0,0,6)_FB_D(01,05)    OK       112     Up
SF_30_00_FB_D(04,04) -> FPC0_T_SG(0,0,7)_FB_D(01,04)    OK       112     Up
SF_30_01_FB_B(16,11) -> FPC4_T_SG(2,0,0)_FB_B(13,11)    OK       119     Up
SF_30_01_FB_B(16,10) -> FPC4_T_SG(2,0,1)_FB_B(13,10)    OK       119     Up
SF_30_01_FB_B(16,09) -> FPC4_T_SG(2,0,2)_FB_B(13,09)    OK       119     Up
SF_30_01_FB_B(16,08) -> FPC4_T_SG(2,0,3)_FB_B(13,08)    OK       119     Up
SF_30_01_FB_B(16,07) -> FPC4_T_SG(2,0,4)_FB_B(13,07)    OK       119     Up
SF_30_01_FB_B(16,06) -> FPC4_T_SG(2,0,5)_FB_B(13,06)    OK       119     Up
SF_30_01_FB_B(16,05) -> FPC4_T_SG(2,0,6)_FB_B(13,05)    OK       119     Up
SF_30_01_FB_B(16,04) -> FPC4_T_SG(2,0,7)_FB_B(13,04)    OK       119     Up
SF_30_02_FB_D(05,08) -> FPC1_T_SG(0,2,0)_FB_D(02,08)    OK       126     Up
SF_30_02_FB_D(05,07) -> FPC1_T_SG(0,2,1)_FB_D(02,07)    OK       126     Up
SF_30_02_FB_D(05,06) -> FPC1_T_SG(0,2,2)_FB_D(02,06)    OK       126     Up
SF_30_02_FB_D(05,05) -> FPC1_T_SG(0,2,3)_FB_D(02,05)    OK       126     Up
SF_30_02_FB_D(05,03) -> FPC1_T_SG(0,2,4)_FB_D(02,03)    OK       126     Up
```

```
SF_30_02_FB_D(05,02) -> FPC1_T_SG(0,2,5)_FB_D(02,02)    OK       126      Up
SF_30_02_FB_D(05,01) -> FPC1_T_SG(0,2,6)_FB_D(02,01)    OK       126      Up
SF_30_02_FB_D(05,00) -> FPC1_T_SG(0,2,7)_FB_D(02,00)    OK       126      Up
SF_30_03_FB_B(17,08) -> FPC5_T_SG(2,2,0)_FB_B(14,08)    OK       133      Up
SF_30_03_FB_B(17,07) -> FPC5_T_SG(2,2,1)_FB_B(14,07)    OK       133      Up
SF_30_03_FB_B(17,06) -> FPC5_T_SG(2,2,2)_FB_B(14,06)    OK       133      Up
SF_30_03_FB_B(17,05) -> FPC5_T_SG(2,2,3)_FB_B(14,05)    OK       133      Up
SF_30_03_FB_B(17,03) -> FPC5_T_SG(2,2,4)_FB_B(14,03)    OK       133      Up
SF_30_03_FB_B(17,02) -> FPC5_T_SG(2,2,5)_FB_B(14,02)    OK       133      Up
SF_30_03_FB_B(17,01) -> FPC5_T_SG(2,2,6)_FB_B(14,01)    OK       133      Up
SF_30_03_FB_B(17,00) -> FPC5_T_SG(2,2,7)_FB_B(14,00)    OK       133      Up
SF_30_04_FB_C(10,11) -> FPC2_T_SG(1,0,0)_FB_C(07,11)    OK       140      Up
SF_30_04_FB_C(10,10) -> FPC2_T_SG(1,0,1)_FB_C(07,10)    OK       140      Up
SF_30_04_FB_C(10,09) -> FPC2_T_SG(1,0,2)_FB_C(07,09)    OK       140      Up
SF_30_04_FB_C(10,08) -> FPC2_T_SG(1,0,3)_FB_C(07,08)    OK       140      Up
SF_30_04_FB_C(10,07) -> FPC2_T_SG(1,0,4)_FB_C(07,07)    OK       140      Up
SF_30_04_FB_C(10,06) -> FPC2_T_SG(1,0,5)_FB_C(07,06)    OK       140      Up
SF_30_04_FB_C(10,05) -> FPC2_T_SG(1,0,6)_FB_C(07,05)    OK       140      Up
SF_30_04_FB_C(10,04) -> FPC2_T_SG(1,0,7)_FB_C(07,04)    OK       140      Up
SF_30_05_FB_A(22,11) -> FPC6_T_SG(3,0,0)_FB_A(19,11)    OK       147      Up
SF_30_05_FB_A(22,10) -> FPC6_T_SG(3,0,1)_FB_A(19,10)    OK       147      Up
SF_30_05_FB_A(22,09) -> FPC6_T_SG(3,0,2)_FB_A(19,09)    OK       147      Up
SF_30_05_FB_A(22,08) -> FPC6_T_SG(3,0,3)_FB_A(19,08)    OK       147      Up
SF_30_05_FB_A(22,07) -> FPC6_T_SG(3,0,4)_FB_A(19,07)    OK       147      Up
SF_30_05_FB_A(22,06) -> FPC6_T_SG(3,0,5)_FB_A(19,06)    OK       147      Up
SF_30_05_FB_A(22,05) -> FPC6_T_SG(3,0,6)_FB_A(19,05)    OK       147      Up
SF_30_05_FB_A(22,04) -> FPC6_T_SG(3,0,7)_FB_A(19,04)    OK       147      Up
SF_30_06_FB_C(11,08) -> FPC3_T_SG(1,2,0)_FB_C(08,08)    OK       154      Up
SF_30_06_FB_C(11,07) -> FPC3_T_SG(1,2,1)_FB_C(08,07)    OK       154      Up
SF_30_06_FB_C(11,06) -> FPC3_T_SG(1,2,2)_FB_C(08,06)    OK       154      Up
SF_30_06_FB_C(11,05) -> FPC3_T_SG(1,2,3)_FB_C(08,05)    OK       154      Up
SF_30_06_FB_C(11,03) -> FPC3_T_SG(1,2,4)_FB_C(08,03)    OK       154      Up
SF_30_06_FB_C(11,02) -> FPC3_T_SG(1,2,5)_FB_C(08,02)    OK       154      Up
SF_30_06_FB_C(11,01) -> FPC3_T_SG(1,2,6)_FB_C(08,01)    OK       154      Up
SF_30_06_FB_C(11,00) -> FPC3_T_SG(1,2,7)_FB_C(08,00)    OK       154      Up
...
```

show chassis fabric topology sfc (TX Matrix Plus Router)

```
user@host> show chassis fabric topology sfc 0
sfc0-re0:
--------------------------------------------------------------------------

F13_SIB0
=========

Out-Links:
=========
SFC0_F13_SIB_00      -> LCC00_ST_SIB_L00                VCSEL    HSL2    HSL2
                                                        Status   Channel Status
================================================================================
SF_30_00_FB_D(04,11) -> FPC0_T_SG(0,0,0)_FB_D(01,11)    OK       112      Up
SF_30_00_FB_D(04,10) -> FPC0_T_SG(0,0,1)_FB_D(01,10)    OK       112      Up
SF_30_00_FB_D(04,09) -> FPC0_T_SG(0,0,2)_FB_D(01,09)    OK       112      Up
SF_30_00_FB_D(04,08) -> FPC0_T_SG(0,0,3)_FB_D(01,08)    OK       112      Up
SF_30_00_FB_D(04,07) -> FPC0_T_SG(0,0,4)_FB_D(01,07)    OK       112      Up
SF_30_00_FB_D(04,06) -> FPC0_T_SG(0,0,5)_FB_D(01,06)    OK       112      Up
SF_30_00_FB_D(04,05) -> FPC0_T_SG(0,0,6)_FB_D(01,05)    OK       112      Up
SF_30_00_FB_D(04,04) -> FPC0_T_SG(0,0,7)_FB_D(01,04)    OK       112      Up
SF_30_01_FB_B(16,11) -> FPC4_T_SG(2,0,0)_FB_B(13,11)    OK       119      Up
SF_30_01_FB_B(16,10) -> FPC4_T_SG(2,0,1)_FB_B(13,10)    OK       119      Up
SF_30_01_FB_B(16,09) -> FPC4_T_SG(2,0,2)_FB_B(13,09)    OK       119      Up
SF_30_01_FB_B(16,08) -> FPC4_T_SG(2,0,3)_FB_B(13,08)    OK       119      Up
```

```
SF_30_01_FB_B(16,07) -> FPC4_T_SG(2,0,4)_FB_B(13,07)    OK      119     Up
SF_30_01_FB_B(16,06) -> FPC4_T_SG(2,0,5)_FB_B(13,06)    OK      119     Up
SF_30_01_FB_B(16,05) -> FPC4_T_SG(2,0,6)_FB_B(13,05)    OK      119     Up
SF_30_01_FB_B(16,04) -> FPC4_T_SG(2,0,7)_FB_B(13,04)    OK      119     Up
SF_30_02_FB_D(05,08) -> FPC1_T_SG(0,2,0)_FB_D(02,08)    OK      126     Up
SF_30_02_FB_D(05,07) -> FPC1_T_SG(0,2,1)_FB_D(02,07)    OK      126     Up
SF_30_02_FB_D(05,06) -> FPC1_T_SG(0,2,2)_FB_D(02,06)    OK      126     Up
SF_30_02_FB_D(05,05) -> FPC1_T_SG(0,2,3)_FB_D(02,05)    OK      126     Up
SF_30_02_FB_D(05,03) -> FPC1_T_SG(0,2,4)_FB_D(02,03)    OK      126     Up
SF_30_02_FB_D(05,02) -> FPC1_T_SG(0,2,5)_FB_D(02,02)    OK      126     Up
SF_30_02_FB_D(05,01) -> FPC1_T_SG(0,2,6)_FB_D(02,01)    OK      126     Up
SF_30_02_FB_D(05,00) -> FPC1_T_SG(0,2,7)_FB_D(02,00)    OK      126     Up
SF_30_03_FB_B(17,08) -> FPC5_T_SG(2,2,0)_FB_B(14,08)    OK      133     Up
SF_30_03_FB_B(17,07) -> FPC5_T_SG(2,2,1)_FB_B(14,07)    OK      133     Up
SF_30_03_FB_B(17,06) -> FPC5_T_SG(2,2,2)_FB_B(14,06)    OK      133     Up
SF_30_03_FB_B(17,05) -> FPC5_T_SG(2,2,3)_FB_B(14,05)    OK      133     Up
SF_30_03_FB_B(17,03) -> FPC5_T_SG(2,2,4)_FB_B(14,03)    OK      133     Up
SF_30_03_FB_B(17,02) -> FPC5_T_SG(2,2,5)_FB_B(14,02)    OK      133     Up
SF_30_03_FB_B(17,01) -> FPC5_T_SG(2,2,6)_FB_B(14,01)    OK      133     Up
SF_30_03_FB_B(17,00) -> FPC5_T_SG(2,2,7)_FB_B(14,00)    OK      133     Up
SF_30_04_FB_C(10,11) -> FPC2_T_SG(1,0,0)_FB_C(07,11)    OK      140     Up
SF_30_04_FB_C(10,10) -> FPC2_T_SG(1,0,1)_FB_C(07,10)    OK      140     Up
SF_30_04_FB_C(10,09) -> FPC2_T_SG(1,0,2)_FB_C(07,09)    OK      140     Up
SF_30_04_FB_C(10,08) -> FPC2_T_SG(1,0,3)_FB_C(07,08)    OK      140     Up
SF_30_04_FB_C(10,07) -> FPC2_T_SG(1,0,4)_FB_C(07,07)    OK      140     Up
SF_30_04_FB_C(10,06) -> FPC2_T_SG(1,0,5)_FB_C(07,06)    OK      140     Up
SF_30_04_FB_C(10,05) -> FPC2_T_SG(1,0,6)_FB_C(07,05)    OK      140     Up
SF_30_04_FB_C(10,04) -> FPC2_T_SG(1,0,7)_FB_C(07,04)    OK      140     Up
SF_30_05_FB_A(22,11) -> FPC6_T_SG(3,0,0)_FB_A(19,11)    OK      147     Up
SF_30_05_FB_A(22,10) -> FPC6_T_SG(3,0,1)_FB_A(19,10)    OK      147     Up
SF_30_05_FB_A(22,09) -> FPC6_T_SG(3,0,2)_FB_A(19,09)    OK      147     Up
SF_30_05_FB_A(22,08) -> FPC6_T_SG(3,0,3)_FB_A(19,08)    OK      147     Up
SF_30_05_FB_A(22,07) -> FPC6_T_SG(3,0,4)_FB_A(19,07)    OK      147     Up
SF_30_05_FB_A(22,06) -> FPC6_T_SG(3,0,5)_FB_A(19,06)    OK      147     Up
SF_30_05_FB_A(22,05) -> FPC6_T_SG(3,0,6)_FB_A(19,05)    OK      147     Up
SF_30_05_FB_A(22,04) -> FPC6_T_SG(3,0,7)_FB_A(19,04)    OK      147     Up
SF_30_06_FB_C(11,08) -> FPC3_T_SG(1,2,0)_FB_C(08,08)    OK      154     Up
SF_30_06_FB_C(11,07) -> FPC3_T_SG(1,2,1)_FB_C(08,07)    OK      154     Up
SF_30_06_FB_C(11,06) -> FPC3_T_SG(1,2,2)_FB_C(08,06)    OK      154     Up
SF_30_06_FB_C(11,05) -> FPC3_T_SG(1,2,3)_FB_C(08,05)    OK      154     Up
SF_30_06_FB_C(11,03) -> FPC3_T_SG(1,2,4)_FB_C(08,03)    OK      154     Up
SF_30_06_FB_C(11,02) -> FPC3_T_SG(1,2,5)_FB_C(08,02)    OK      154     Up
SF_30_06_FB_C(11,01) -> FPC3_T_SG(1,2,6)_FB_C(08,01)    OK      154     Up
SF_30_06_FB_C(11,00) -> FPC3_T_SG(1,2,7)_FB_C(08,00)    OK      154     Up
...
```

show chassis fabric topology lcc (TX Matrix Plus Router)

```
user@host> show chassis fabric topology lcc 0
lcc0-re0:
--------------------------------------------------------------------------

SIB0
=========

Out-Links:
=========
LCC00_ST_SIB_L00          -> SFC0_F13_SIB_00          VCSEL    HSL2    HSL2
                                                      Status   Channel Status
================================================================================
FPC0_T_SG(0,0,0)_FB_D(04,11) -> SF_10_00_FB_D(01,11)   OK      12      Up
FPC0_T_SG(0,0,1)_FB_D(04,10) -> SF_10_00_FB_D(01,10)   OK      12      Up
FPC0_T_SG(0,0,2)_FB_D(04,09) -> SF_10_00_FB_D(01,09)   OK      12      Up
```



```
FPC0_T_SG(0,0,3)_FB_D(04,08) -> SF_10_00_FB_D(01,08)     OK        12        Up
FPC0_T_SG(0,0,4)_FB_D(04,07) -> SF_10_00_FB_D(01,07)     OK        12        Up
FPC0_T_SG(0,0,5)_FB_D(04,06) -> SF_10_00_FB_D(01,06)     OK        12        Up
FPC0_T_SG(0,0,6)_FB_D(04,05) -> SF_10_00_FB_D(01,05)     OK        12        Up
FPC0_T_SG(0,0,7)_FB_D(04,04) -> SF_10_00_FB_D(01,04)     OK        12        Up
FPC0_B_SG(0,1,0)_FB_D(03,07) -> SF_10_10_FB_D(00,07)     OK        15        Up
FPC0_B_SG(0,1,1)_FB_D(03,06) -> SF_10_10_FB_D(00,06)     OK        15        Up
FPC0_B_SG(0,1,2)_FB_D(03,05) -> SF_10_10_FB_D(00,05)     OK        15        Up
FPC0_B_SG(0,1,3)_FB_D(03,04) -> SF_10_10_FB_D(00,04)     OK        15        Up
FPC0_B_SG(0,1,4)_FB_D(03,03) -> SF_10_10_FB_D(00,03)     OK        15        Up
FPC0_B_SG(0,1,5)_FB_D(03,02) -> SF_10_10_FB_D(00,02)     OK        15        Up
FPC0_B_SG(0,1,6)_FB_D(03,01) -> SF_10_10_FB_D(00,01)     OK        15        Up
FPC0_B_SG(0,1,7)_FB_D(03,00) -> SF_10_10_FB_D(00,00)     OK        15        Up
FPC1_T_SG(0,2,0)_FB_D(05,08) -> SF_10_02_FB_D(02,08)     OK        18        Up
FPC1_T_SG(0,2,1)_FB_D(05,07) -> SF_10_02_FB_D(02,07)     OK        18        Up
FPC1_T_SG(0,2,2)_FB_D(05,06) -> SF_10_02_FB_D(02,06)     OK        18        Up
FPC1_T_SG(0,2,3)_FB_D(05,05) -> SF_10_02_FB_D(02,05)     OK        18        Up
FPC1_T_SG(0,2,4)_FB_D(05,03) -> SF_10_02_FB_D(02,03)     OK        18        Up
FPC1_T_SG(0,2,5)_FB_D(05,02) -> SF_10_02_FB_D(02,02)     OK        18        Up
FPC1_T_SG(0,2,6)_FB_D(05,01) -> SF_10_02_FB_D(02,01)     OK        18        Up
FPC1_T_SG(0,2,7)_FB_D(05,00) -> SF_10_02_FB_D(02,00)     OK        18        Up
FPC1_B_SG(0,3,0)_FB_D(04,03) -> SF_10_11_FB_D(01,03)     OK        21        Up
FPC1_B_SG(0,3,1)_FB_D(04,02) -> SF_10_11_FB_D(01,02)     OK        21        Up
FPC1_B_SG(0,3,2)_FB_D(04,01) -> SF_10_11_FB_D(01,01)     OK        21        Up
FPC1_B_SG(0,3,3)_FB_D(04,00) -> SF_10_11_FB_D(01,00)     OK        21        Up
FPC1_B_SG(0,3,4)_FB_D(03,11) -> SF_10_11_FB_D(00,11)     OK        21        Up
FPC1_B_SG(0,3,5)_FB_D(03,10) -> SF_10_11_FB_D(00,10)     OK        21        Up
FPC1_B_SG(0,3,6)_FB_D(03,09) -> SF_10_11_FB_D(00,09)     OK        21        Up
FPC1_B_SG(0,3,7)_FB_D(03,08) -> SF_10_11_FB_D(00,08)     OK        21        Up
FPC2_T_SG(1,0,0)_FB_C(10,11) -> SF_10_04_FB_C(07,11)     OK        12        Up
FPC2_T_SG(1,0,1)_FB_C(10,10) -> SF_10_04_FB_C(07,10)     OK        12        Up
FPC2_T_SG(1,0,2)_FB_C(10,09) -> SF_10_04_FB_C(07,09)     OK        12        Up
FPC2_T_SG(1,0,3)_FB_C(10,08) -> SF_10_04_FB_C(07,08)     OK        12        Up
FPC2_T_SG(1,0,4)_FB_C(10,07) -> SF_10_04_FB_C(07,07)     OK        12        Up
FPC2_T_SG(1,0,5)_FB_C(10,06) -> SF_10_04_FB_C(07,06)     OK        12        Up
FPC2_T_SG(1,0,6)_FB_C(10,05) -> SF_10_04_FB_C(07,05)     OK        12        Up
FPC2_T_SG(1,0,7)_FB_C(10,04) -> SF_10_04_FB_C(07,04)     OK        12        Up
FPC2_B_SG(1,1,0)_FB_C(09,07) -> SF_10_14_FB_C(06,07)     OK        15        Up
FPC2_B_SG(1,1,1)_FB_C(09,06) -> SF_10_14_FB_C(06,06)     OK        15        Up
FPC2_B_SG(1,1,2)_FB_C(09,05) -> SF_10_14_FB_C(06,05)     OK        15        Up
FPC2_B_SG(1,1,3)_FB_C(09,04) -> SF_10_14_FB_C(06,04)     OK        15        Up
FPC2_B_SG(1,1,4)_FB_C(09,03) -> SF_10_14_FB_C(06,03)     OK        15        Up
FPC2_B_SG(1,1,5)_FB_C(09,02) -> SF_10_14_FB_C(06,02)     OK        15        Up
FPC2_B_SG(1,1,6)_FB_C(09,01) -> SF_10_14_FB_C(06,01)     OK        15        Up
FPC2_B_SG(1,1,7)_FB_C(09,00) -> SF_10_14_FB_C(06,00)     OK        15        Up
FPC3_T_SG(1,2,0)_FB_C(11,08) -> SF_10_06_FB_C(08,08)     OK        18        Up
FPC3_T_SG(1,2,1)_FB_C(11,07) -> SF_10_06_FB_C(08,07)     OK        18        Up
FPC3_T_SG(1,2,2)_FB_C(11,06) -> SF_10_06_FB_C(08,06)     OK        18        Up
FPC3_T_SG(1,2,3)_FB_C(11,05) -> SF_10_06_FB_C(08,05)     OK        18        Up
FPC3_T_SG(1,2,4)_FB_C(11,03) -> SF_10_06_FB_C(08,03)     OK        18        Up
FPC3_T_SG(1,2,5)_FB_C(11,02) -> SF_10_06_FB_C(08,02)     OK        18        Up
FPC3_T_SG(1,2,6)_FB_C(11,01) -> SF_10_06_FB_C(08,01)     OK        18        Up
...
```

show chassis fabric topology (T4000 Core Router)

```
user@host> show chassis fabric topology 0
 fchip (mode)
          In-links                State            Out-links              State
--------------------------------------------------------------------------------


SIB0 :
```

```
---------

Onboard Links
-------------
SIB0_XF1,14_0->SIB0_XF,00_0       Up      SIB0_XF,00_0->SIB0_XF1,14_0       Up
SIB0_XF,00_0->SIB0_XF1,14_0       Up      SIB0_XF1,14_0->SIB0_XF,00_0       Up
SIB0_XF1,13_0->SIB0_XF,01_0       Up      SIB0_XF,01_0->SIB0_XF1,13_0       Up
SIB0_XF,01_0->SIB0_XF1,13_0       Up      SIB0_XF1,13_0->SIB0_XF,01_0       Up
SIB0_XF1,12_0->SIB0_XF,02_0       Up      SIB0_XF,02_0->SIB0_XF1,12_0       Up
SIB0_XF,02_0->SIB0_XF1,12_0       Up      SIB0_XF1,12_0->SIB0_XF,02_0       Up
SIB0_XF1,11_0->SIB0_XF,03_0       Up      SIB0_XF,03_0->SIB0_XF1,11_0       Up
SIB0_XF,03_0->SIB0_XF1,11_0       Up      SIB0_XF1,11_0->SIB0_XF,03_0       Up
SIB0_XF1,10_0->SIB0_XF,04_0       Up      SIB0_XF,04_0->SIB0_XF1,10_0       Up
SIB0_XF,04_0->SIB0_XF1,10_0       Up      SIB0_XF1,10_0->SIB0_XF,04_0       Up
SIB0_XF1,09_0->SIB0_XF,05_0       Up      SIB0_XF,05_0->SIB0_XF1,09_0       Up
SIB0_XF,05_0->SIB0_XF1,09_0       Up      SIB0_XF1,09_0->SIB0_XF,05_0       Up
SIB0_XF2,14_0->SIB0_XF,06_0       Up      SIB0_XF,06_0->SIB0_XF2,14_0       Up
SIB0_XF,06_0->SIB0_XF2,14_0       Up      SIB0_XF2,14_0->SIB0_XF,06_0       Up
SIB0_XF2,13_0->SIB0_XF,07_0       Up      SIB0_XF,07_0->SIB0_XF2,13_0       Up
SIB0_XF,07_0->SIB0_XF2,13_0       Up      SIB0_XF2,13_0->SIB0_XF,07_0       Up
SIB0_XF2,12_0->SIB0_XF,08_0       Up      SIB0_XF,08_0->SIB0_XF2,12_0       Up
SIB0_XF,08_0->SIB0_XF2,12_0       Up      SIB0_XF2,12_0->SIB0_XF,08_0       Up
SIB0_XF2,11_0->SIB0_XF,09_0       Up      SIB0_XF,09_0->SIB0_XF2,11_0       Up
SIB0_XF,09_0->SIB0_XF2,11_0       Up      SIB0_XF2,11_0->SIB0_XF,09_0       Up
SIB0_XF2,10_0->SIB0_XF,10_0       Up      SIB0_XF,10_0->SIB0_XF2,10_0       Up
SIB0_XF,10_0->SIB0_XF2,10_0       Up      SIB0_XF2,10_0->SIB0_XF,10_0       Up
SIB0_XF2,09_0->SIB0_XF,11_0       Up      SIB0_XF,11_0->SIB0_XF2,09_0       Up
SIB0_XF,11_0->SIB0_XF2,09_0       Up      SIB0_XF2,09_0->SIB0_XF,11_0       Up
SIB0_XF3,13_0->SIB0_XF,12_0       Up      SIB0_XF,12_0->SIB0_XF3,13_0       Up
SIB0_XF,12_0->SIB0_XF3,13_0       Up      SIB0_XF3,13_0->SIB0_XF,12_0       Up
SIB0_XF3,12_0->SIB0_XF,13_0       Up      SIB0_XF,13_0->SIB0_XF3,12_0       Up
SIB0_XF,13_0->SIB0_XF3,12_0       Up      SIB0_XF3,12_0->SIB0_XF,13_0       Up
SIB0_XF3,11_0->SIB0_XF,14_0       Up      SIB0_XF,14_0->SIB0_XF3,11_0       Up
SIB0_XF,14_0->SIB0_XF3,11_0       Up      SIB0_XF3,11_0->SIB0_XF,14_0       Up
SIB0_XF3,10_0->SIB0_XF,15_0       Up      SIB0_XF,15_0->SIB0_XF3,10_0       Up
SIB0_XF,15_0->SIB0_XF3,10_0       Up      SIB0_XF3,10_0->SIB0_XF,15_0       Up

PFE Links
---------------
FPC2PFE0->SIB0_XF1,05_0           Up      SIB0_XF1,05_0->FPC2PFE0           Up
FPC3PFE0->SIB0_XF2,15_0           Up      SIB0_XF2,15_0->FPC3PFE0           Up
FPC5PFE0->SIB0_XF2,05_0           Up      SIB0_XF2,05_0->FPC5PFE0           Up
FPC5PFE1->SIB0_XF2,07_0           Up      SIB0_XF2,07_0->FPC5PFE1           Up
FPC6PFE0->SIB0_XF3,01_0           Up      SIB0_XF3,01_0->FPC6PFE0           Up
FPC6PFE0->SIB0_XF3,01_1           Up      SIB0_XF3,01_1->FPC6PFE0           Up
FPC6PFE0->SIB0_XF3,02_0           Up      SIB0_XF3,02_0->FPC6PFE0           Up
FPC6PFE1->SIB0_XF3,03_0           Up      SIB0_XF3,03_0->FPC6PFE1           Up
FPC6PFE1->SIB0_XF3,03_1           Up      SIB0_XF3,03_1->FPC6PFE1           Up
FPC6PFE1->SIB0_XF3,02_1           Up      SIB0_XF3,02_1->FPC6PFE1           Up
```

show chassis fabric topology (PTX Series

```
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#)
```


Packet Transport Switches)

```
 Out-link : SIB# TF#_FCORE# (TF-TX port#, TF-TX sub-chn#, TF-TX inst#) ->
            FPC# FE# TQ# (TQ-RX sub-chnl #)
(6, 4, 06) in FPC02FE0TQ0(02)->S01F0_0(6,4,06) will be TF Rx Port 6, TF CCL Rx
Sub-Channel 4, TF CCL Rx Instance 6.
(2, 7, 10) in S01F0_0(2,7,10)->FPC02FE0TQ0(02) will be TF-Tx Port 2, TF CCL Tx
Sub-channel 7, TF CCL Tx Instance 10.
SIB 0 FCHIP 0 FCORE 0 :
-----------------------
           In-links              State            Out-links              State
--------------------------------------------------------------------------------
FPC00FE0TQ0(00)->S00F0_0(7,4,07) OK      S00F0_0(3,7,11)->FPC00FE0TQ0(00) OK
FPC00FE1TQ1(00)->S00F0_0(7,6,07) OK      S00F0_0(3,5,11)->FPC00FE1TQ1(00) OK
FPC00FE2TQ2(00)->S00F0_0(7,5,07) OK      S00F0_0(3,6,11)->FPC00FE2TQ2(00) OK
FPC00FE3TQ3(00)->S00F0_0(7,7,07) OK      S00F0_0(3,4,11)->FPC00FE3TQ3(00) OK
FPC01FE0TQ0(00)->S00F0_0(7,0,07) OK      S00F0_0(3,3,11)->FPC01FE0TQ0(00) OK
FPC01FE1TQ1(00)->S00F0_0(7,1,07) OK      S00F0_0(3,1,11)->FPC01FE1TQ1(00) OK
FPC01FE2TQ2(00)->S00F0_0(7,2,07) OK      S00F0_0(3,2,11)->FPC01FE2TQ2(00) Error
FPC01FE3TQ3(00)->S00F0_0(7,3,07) OK      S00F0_0(3,0,11)->FPC01FE3TQ3(00) OK
FPC02FE0TQ0(00)->S00F0_0(6,4,06) OK      S00F0_0(2,7,10)->FPC02FE0TQ0(00) OK
FPC02FE1TQ1(00)->S00F0_0(6,5,06) OK      S00F0_0(2,5,10)->FPC02FE1TQ1(00) OK
FPC02FE2TQ2(00)->S00F0_0(6,6,06) OK      S00F0_0(2,6,10)->FPC02FE2TQ2(00) OK
FPC02FE3TQ3(00)->S00F0_0(6,7,06) OK      S00F0_0(2,4,10)->FPC02FE3TQ3(00) OK
FPC03FE0TQ0(00)->S00F0_0(6,0,06) Down    S00F0_0(2,3,10)->FPC03FE0TQ0(00) Down
FPC03FE1TQ1(00)->S00F0_0(6,1,06) Down    S00F0_0(2,0,10)->FPC03FE1TQ1(00) Down
FPC03FE2TQ2(00)->S00F0_0(6,2,06) Down    S00F0_0(2,2,10)->FPC03FE2TQ2(00) Down
FPC03FE3TQ3(00)->S00F0_0(6,3,06) Down    S00F0_0(2,1,10)->FPC03FE3TQ3(00) Down
FPC04FE0TQ0(00)->S00F0_0(5,4,05) OK      S00F0_0(1,7,09)->FPC04FE0TQ0(00) OK
FPC04FE1TQ1(00)->S00F0_0(5,5,05) OK      S00F0_0(1,6,09)->FPC04FE1TQ1(00) OK
FPC04FE2TQ2(00)->S00F0_0(5,6,05) OK      S00F0_0(1,4,09)->FPC04FE2TQ2(00) OK
FPC04FE3TQ3(00)->S00F0_0(5,7,05) OK      S00F0_0(1,5,09)->FPC04FE3TQ3(00) OK
FPC05FE0TQ0(00)->S00F0_0(5,0,05) OK      S00F0_0(1,3,09)->FPC05FE0TQ0(00) OK
FPC05FE1TQ1(00)->S00F0_0(5,1,05) OK      S00F0_0(1,0,09)->FPC05FE1TQ1(00) OK
FPC05FE2TQ2(00)->S00F0_0(5,2,05) OK      S00F0_0(1,2,09)->FPC05FE2TQ2(00) OK
FPC05FE3TQ3(00)->S00F0_0(5,3,05) OK      S00F0_0(1,1,09)->FPC05FE3TQ3(00) OK
FPC06FE0TQ0(00)->S00F0_0(4,4,04) Down    S00F0_0(0,7,08)->FPC06FE0TQ0(00) Down
FPC06FE1TQ1(00)->S00F0_0(4,5,04) Down    S00F0_0(0,5,08)->FPC06FE1TQ1(00) Down
FPC06FE2TQ2(00)->S00F0_0(4,6,04) Down    S00F0_0(0,6,08)->FPC06FE2TQ2(00) Down
FPC06FE3TQ3(00)->S00F0_0(4,7,04) Down    S00F0_0(0,4,08)->FPC06FE3TQ3(00) Down
FPC07FE0TQ0(00)->S00F0_0(4,2,04) Down    S00F0_0(0,3,08)->FPC07FE0TQ0(00) Down
FPC07FE1TQ1(00)->S00F0_0(4,0,04) Down    S00F0_0(0,0,08)->FPC07FE1TQ1(00) Down
FPC07FE2TQ2(00)->S00F0_0(4,1,04) Down    S00F0_0(0,1,08)->FPC07FE2TQ2(00) Down
FPC07FE3TQ3(00)->S00F0_0(4,3,04) Down    S00F0_0(0,2,08)->FPC07FE3TQ3(00) Down

SIB 0 FCHIP 0 FCORE 1 :
-----------------------
           In-links              State            Out-links              State
--------------------------------------------------------------------------------
FPC00FE0TQ0(01)->S00F0_1(3,4,11) OK      S00F0_1(7,6,07)->FPC00FE0TQ0(01) OK
FPC00FE1TQ1(01)->S00F0_1(3,5,11) OK      S00F0_1(7,4,07)->FPC00FE1TQ1(01) OK
FPC00FE2TQ2(01)->S00F0_1(3,6,11) OK      S00F0_1(7,7,07)->FPC00FE2TQ2(01) OK
FPC00FE3TQ3(01)->S00F0_1(3,7,11) OK      S00F0_1(7,5,07)->FPC00FE3TQ3(01) OK
FPC01FE0TQ0(01)->S00F0_1(3,0,11) OK      S00F0_1(7,2,07)->FPC01FE0TQ0(01) OK
FPC01FE1TQ1(01)->S00F0_1(3,1,11) OK      S00F0_1(7,0,07)->FPC01FE1TQ1(01) OK
FPC01FE2TQ2(01)->S00F0_1(3,2,11) OK      S00F0_1(7,3,07)->FPC01FE2TQ2(01) OK
FPC01FE3TQ3(01)->S00F0_1(3,3,11) OK      S00F0_1(7,1,07)->FPC01FE3TQ3(01) OK
FPC02FE0TQ0(01)->S00F0_1(2,4,10) OK      S00F0_1(6,5,06)->FPC02FE0TQ0(01) OK
FPC02FE1TQ1(01)->S00F0_1(2,5,10) OK      S00F0_1(6,4,06)->FPC02FE1TQ1(01) OK
FPC02FE2TQ2(01)->S00F0_1(2,6,10) OK      S00F0_1(6,7,06)->FPC02FE2TQ2(01) OK
FPC02FE3TQ3(01)->S00F0_1(2,7,10) OK      S00F0_1(6,6,06)->FPC02FE3TQ3(01) OK
FPC03FE0TQ0(01)->S00F0_1(2,0,10) Down    S00F0_1(6,1,06)->FPC03FE0TQ0(01) Down
```

```
FPC03FE1TQ1(01)->S00F0_1(2,1,10) Down    S00F0_1(6,0,06)->FPC03FE1TQ1(01) Down
FPC03FE2TQ2(01)->S00F0_1(2,2,10) Down    S00F0_1(6,3,06)->FPC03FE2TQ2(01) Down
FPC03FE3TQ3(01)->S00F0_1(2,3,10) Down    S00F0_1(6,2,06)->FPC03FE3TQ3(01) Down
FPC04FE0TQ0(01)->S00F0_1(1,4,09) OK      S00F0_1(5,5,05)->FPC04FE0TQ0(01) OK
FPC04FE1TQ1(01)->S00F0_1(1,5,09) OK      S00F0_1(5,4,05)->FPC04FE1TQ1(01) OK
FPC04FE2TQ2(01)->S00F0_1(1,6,09) OK      S00F0_1(5,7,05)->FPC04FE2TQ2(01) OK
FPC04FE3TQ3(01)->S00F0_1(1,7,09) OK      S00F0_1(5,6,05)->FPC04FE3TQ3(01) OK
FPC05FE0TQ0(01)->S00F0_1(1,0,09) OK      S00F0_1(5,1,05)->FPC05FE0TQ0(01) OK
FPC05FE1TQ1(01)->S00F0_1(1,1,09) OK      S00F0_1(5,0,05)->FPC05FE1TQ1(01) OK
FPC05FE2TQ2(01)->S00F0_1(1,2,09) OK      S00F0_1(5,3,05)->FPC05FE2TQ2(01) OK
FPC05FE3TQ3(01)->S00F0_1(1,3,09) OK      S00F0_1(5,2,05)->FPC05FE3TQ3(01) OK
FPC06FE0TQ0(01)->S00F0_1(0,4,08) Down    S00F0_1(4,7,04)->FPC06FE0TQ0(01) Down
FPC06FE1TQ1(01)->S00F0_1(0,5,08) Down    S00F0_1(4,0,04)->FPC06FE1TQ1(01) Down
FPC06FE2TQ2(01)->S00F0_1(0,6,08) Down    S00F0_1(4,6,04)->FPC06FE2TQ2(01) Down
FPC06FE3TQ3(01)->S00F0_1(0,7,08) Down    S00F0_1(4,1,04)->FPC06FE3TQ3(01) Down
FPC07FE0TQ0(01)->S00F0_1(0,0,08) Down    S00F0_1(4,3,04)->FPC07FE0TQ0(01) Down
FPC07FE1TQ1(01)->S00F0_1(0,1,08) Down    S00F0_1(4,4,04)->FPC07FE1TQ1(01) Down
FPC07FE2TQ2(01)->S00F0_1(0,2,08) Down    S00F0_1(4,2,04)->FPC07FE2TQ2(01) Down
FPC07FE3TQ3(01)->S00F0_1(0,3,08) Down    S00F0_1(4,5,04)->FPC07FE3TQ3(01) Down

SIB 1 FCHIP 0 FCORE 0 :
-----------------------
         In-links              State           Out-links              State
--------------------------------------------------------------------------------
FPC00FE0TQ0(02)->S01F0_0(7,4,07) Error   S01F0_0(3,7,11)->FPC00FE0TQ0(02) Down
FPC00FE1TQ1(02)->S01F0_0(7,6,07) OK      S01F0_0(3,5,11)->FPC00FE1TQ1(02) OK
FPC00FE2TQ2(02)->S01F0_0(7,5,07) OK      S01F0_0(3,6,11)->FPC00FE2TQ2(02) OK
FPC00FE3TQ3(02)->S01F0_0(7,7,07) OK      S01F0_0(3,4,11)->FPC00FE3TQ3(02) OK
FPC01FE0TQ0(02)->S01F0_0(7,0,07) OK      S01F0_0(3,3,11)->FPC01FE0TQ0(02) OK
FPC01FE1TQ1(02)->S01F0_0(7,1,07) OK      S01F0_0(3,1,11)->FPC01FE1TQ1(02) OK
FPC01FE2TQ2(02)->S01F0_0(7,2,07) OK      S01F0_0(3,2,11)->FPC01FE2TQ2(02) OK
FPC01FE3TQ3(02)->S01F0_0(7,3,07) OK      S01F0_0(3,0,11)->FPC01FE3TQ3(02) OK
FPC02FE0TQ0(02)->S01F0_0(6,4,06) OK      S01F0_0(2,7,10)->FPC02FE0TQ0(02) OK
FPC02FE1TQ1(02)->S01F0_0(6,5,06) OK      S01F0_0(2,5,10)->FPC02FE1TQ1(02) OK
FPC02FE2TQ2(02)->S01F0_0(6,6,06) OK      S01F0_0(2,6,10)->FPC02FE2TQ2(02) OK
FPC02FE3TQ3(02)->S01F0_0(6,7,06) OK      S01F0_0(2,4,10)->FPC02FE3TQ3(02) OK
FPC03FE0TQ0(02)->S01F0_0(6,0,06) Down    S01F0_0(2,3,10)->FPC03FE0TQ0(02) Down
FPC03FE1TQ1(02)->S01F0_0(6,1,06) Down    S01F0_0(2,0,10)->FPC03FE1TQ1(02) Down
FPC03FE2TQ2(02)->S01F0_0(6,2,06) Down    S01F0_0(2,2,10)->FPC03FE2TQ2(02) Down
FPC03FE3TQ3(02)->S01F0_0(6,3,06) Down    S01F0_0(2,1,10)->FPC03FE3TQ3(02) Down
FPC04FE0TQ0(02)->S01F0_0(5,4,05) OK      S01F0_0(1,7,09)->FPC04FE0TQ0(02) OK
FPC04FE1TQ1(02)->S01F0_0(5,5,05) OK      S01F0_0(1,6,09)->FPC04FE1TQ1(02) OK
FPC04FE2TQ2(02)->S01F0_0(5,6,05) OK      S01F0_0(1,4,09)->FPC04FE2TQ2(02) OK
FPC04FE3TQ3(02)->S01F0_0(5,7,05) OK      S01F0_0(1,5,09)->FPC04FE3TQ3(02) OK
FPC05FE0TQ0(02)->S01F0_0(5,0,05) OK      S01F0_0(1,3,09)->FPC05FE0TQ0(02) OK
FPC05FE1TQ1(02)->S01F0_0(5,1,05) OK      S01F0_0(1,0,09)->FPC05FE1TQ1(02) OK
FPC05FE2TQ2(02)->S01F0_0(5,2,05) OK      S01F0_0(1,2,09)->FPC05FE2TQ2(02) OK
FPC05FE3TQ3(02)->S01F0_0(5,3,05) OK      S01F0_0(1,1,09)->FPC05FE3TQ3(02) OK
FPC06FE0TQ0(02)->S01F0_0(4,4,04) Down    S01F0_0(0,7,08)->FPC06FE0TQ0(02) Down
FPC06FE1TQ1(02)->S01F0_0(4,5,04) Down    S01F0_0(0,5,08)->FPC06FE1TQ1(02) Down
FPC06FE2TQ2(02)->S01F0_0(4,6,04) Down    S01F0_0(0,6,08)->FPC06FE2TQ2(02) Down
FPC06FE3TQ3(02)->S01F0_0(4,7,04) Down    S01F0_0(0,4,08)->FPC06FE3TQ3(02) Down
FPC07FE0TQ0(02)->S01F0_0(4,2,04) Down    S01F0_0(0,3,08)->FPC07FE0TQ0(02) Down
FPC07FE1TQ1(02)->S01F0_0(4,0,04) Down    S01F0_0(0,0,08)->FPC07FE1TQ1(02) Down
FPC07FE2TQ2(02)->S01F0_0(4,1,04) Down    S01F0_0(0,1,08)->FPC07FE2TQ2(02) Down
FPC07FE3TQ3(02)->S01F0_0(4,3,04) Down    S01F0_0(0,2,08)->FPC07FE3TQ3(02) Down

SIB 1 FCHIP 0 FCORE 1 :
-----------------------
         In-links              State           Out-links              State
--------------------------------------------------------------------------------
```



```
FPC00FE0TQ0(03)->S01F0_1(3,4,11) OK      S01F0_1(7,6,07)->FPC00FE0TQ0(03) OK
FPC00FE1TQ1(03)->S01F0_1(3,5,11) OK      S01F0_1(7,4,07)->FPC00FE1TQ1(03) OK
FPC00FE2TQ2(03)->S01F0_1(3,6,11) OK      S01F0_1(7,7,07)->FPC00FE2TQ2(03) OK
FPC00FE3TQ3(03)->S01F0_1(3,7,11) OK      S01F0_1(7,5,07)->FPC00FE3TQ3(03) OK
FPC01FE0TQ0(03)->S01F0_1(3,0,11) OK      S01F0_1(7,2,07)->FPC01FE0TQ0(03) OK
FPC01FE1TQ1(03)->S01F0_1(3,1,11) OK      S01F0_1(7,0,07)->FPC01FE1TQ1(03) OK
FPC01FE2TQ2(03)->S01F0_1(3,2,11) OK      S01F0_1(7,3,07)->FPC01FE2TQ2(03) OK
FPC01FE3TQ3(03)->S01F0_1(3,3,11) OK      S01F0_1(7,1,07)->FPC01FE3TQ3(03) OK
FPC02FE0TQ0(03)->S01F0_1(2,4,10) OK      S01F0_1(6,5,06)->FPC02FE0TQ0(03) OK
FPC02FE1TQ1(03)->S01F0_1(2,5,10) OK      S01F0_1(6,4,06)->FPC02FE1TQ1(03) OK
FPC02FE2TQ2(03)->S01F0_1(2,6,10) OK      S01F0_1(6,7,06)->FPC02FE2TQ2(03) OK
FPC02FE3TQ3(03)->S01F0_1(2,7,10) OK      S01F0_1(6,6,06)->FPC02FE3TQ3(03) OK
FPC03FE0TQ0(03)->S01F0_1(2,0,10) Down    S01F0_1(6,1,06)->FPC03FE0TQ0(03) Down
FPC03FE1TQ1(03)->S01F0_1(2,1,10) Down    S01F0_1(6,0,06)->FPC03FE1TQ1(03) Down
FPC03FE2TQ2(03)->S01F0_1(2,2,10) Down    S01F0_1(6,3,06)->FPC03FE2TQ2(03) Down
FPC03FE3TQ3(03)->S01F0_1(2,3,10) Down    S01F0_1(6,2,06)->FPC03FE3TQ3(03) Down
FPC04FE0TQ0(03)->S01F0_1(1,4,09) OK      S01F0_1(5,5,05)->FPC04FE0TQ0(03) OK
FPC04FE1TQ1(03)->S01F0_1(1,5,09) OK      S01F0_1(5,4,05)->FPC04FE1TQ1(03) OK
FPC04FE2TQ2(03)->S01F0_1(1,6,09) OK      S01F0_1(5,7,05)->FPC04FE2TQ2(03) OK
FPC04FE3TQ3(03)->S01F0_1(1,7,09) OK      S01F0_1(5,6,05)->FPC04FE3TQ3(03) OK
FPC05FE0TQ0(03)->S01F0_1(1,0,09) OK      S01F0_1(5,1,05)->FPC05FE0TQ0(03) OK
FPC05FE1TQ1(03)->S01F0_1(1,1,09) OK      S01F0_1(5,0,05)->FPC05FE1TQ1(03) OK
FPC05FE2TQ2(03)->S01F0_1(1,2,09) OK      S01F0_1(5,3,05)->FPC05FE2TQ2(03) OK
FPC05FE3TQ3(03)->S01F0_1(1,3,09) OK      S01F0_1(5,2,05)->FPC05FE3TQ3(03) OK
FPC06FE0TQ0(03)->S01F0_1(0,4,08) Down    S01F0_1(4,7,04)->FPC06FE0TQ0(03) Down
FPC06FE1TQ1(03)->S01F0_1(0,5,08) Down    S01F0_1(4,0,04)->FPC06FE1TQ1(03) Down
FPC06FE2TQ2(03)->S01F0_1(0,6,08) Down    S01F0_1(4,6,04)->FPC06FE2TQ2(03) Down
FPC06FE3TQ3(03)->S01F0_1(0,7,08) Down    S01F0_1(4,1,04)->FPC06FE3TQ3(03) Down
FPC07FE0TQ0(03)->S01F0_1(0,0,08) Down    S01F0_1(4,3,04)->FPC07FE0TQ0(03) Down
FPC07FE1TQ1(03)->S01F0_1(0,1,08) Down    S01F0_1(4,4,04)->FPC07FE1TQ1(03) Down
FPC07FE2TQ2(03)->S01F0_1(0,2,08) Down    S01F0_1(4,2,04)->FPC07FE2TQ2(03) Down
FPC07FE3TQ3(03)->S01F0_1(0,3,08) Down    S01F0_1(4,5,04)->FPC07FE3TQ3(03) Down
```

show chassis fabric 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 Switches.

Description Display the current state of reachability between the Packet Forwarding Engines in the system.

Additional Information

Required Privilege Level view

Related Documentation

- show chassis fabric errors on page 710
- show chassis fabric reachability on page 795
- degraded

List of Sample Output show chassis fabric degraded-fabric-reachability on page 829

Output Fields Table 59 on page 828 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 59: 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 12.1 for MX240, MX840, and MX960 routers.
Command introduced in Junos OS Release 12.1X48R4 for PTX Series Packet Transport Switches.

Description (M320, MX240, MX480, MX960, 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
- show chassis fabric reachability on page 795

List of Sample Output show chassis fabric unreachable-destinations on page 831

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 60: 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 *FPC number*/Packet Forwarding Engines *Packet Forwarding Engine number* that are not reachable from the source FPCs *FPC number*/Packet Forwarding Engines *Packet Forwarding Engine number* over the fabric.

Sample Output

show chassis fabric unreachable-destinations

```
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 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

- request chassis feb on page 389
- show chassis fabric feb on page 709
- show chassis fpc-feb-connectivity on page 876
- feb
- Switching Control Board Redundancy

List of Sample Output

show chassis feb (M10 Router) on page 834
show chassis feb (M120 Router) on page 834
show chassis feb detail (M120 Router) on page 834
show chassis feb detail (ACX2000 Universal Access Router) on page 835
show chassis feb detail (ACX1000 Universal Access Router) on page 835

Output Fields Table 61 on page 832 lists the output fields for the **show chassis feb** command. Output fields are listed in the approximate order in which they appear.

Table 61: show chassis feb

Field Name	Field Description

State	State of the FEB:
	• **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:
	  ◦ 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 61: show chassis feb *(continued)*

Field Name	Field Description
CPU Utilization (%)	Percentage of CPU being used: • **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: • **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
                    Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State           (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
  0  Online           47     4          0        512         7         60
  1  Online           54     3          0        512         7         59
  2  Online           50     4          0        512         7         59
  3  Online           49     4          0        512         7         59
  4  Online           46     3          0        512         7         59
  5  Online           35     3          0        512         7         59
```

show chassis feb detail (M120 Router)

```
user@host> show chassis feb detail
Slot 0 information:
  State                                 Online
  Intake temperature                 48 degrees C / 118 degrees F
  Exhaust A temperature              51 degrees C / 123 degrees F
  Exhaust B temperature              52 degrees C / 125 degrees F
  Total DDR DRAM                    512 MB
  Total RLDRAM                       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 RLDRAM                       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 RLDRAM                       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 RLDRAM                         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 RLDRAM                         32 MB
  Start time:                             2006-06-28 15:00:29 PDT
  Uptime:                                 10 minutes, 32 seconds
Slot 5 information:
  State                                   Online
  Intake temperature                   35 degrees C / 95 degrees F
  Exhaust A temperature                33 degrees C / 91 degrees F
  Exhaust B temperature                40 degrees C / 104 degrees F
  Total DDR DRAM                      512 MB
  Total RLDRAM                         32 MB
  Start time:                             2006-06-28 15:00:27 PDT
  Uptime:                                 10 minutes, 34 seconds
```

show chassis feb detail (ACX2000 Universal 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

Syntax

show chassis firmware

Syntax (TX Matrix Routers)

show chassis firmware
<lcc *number* | scc>

Syntax (TX Matrix Plus Routers)

show chassis firmware
<lcc *number* | sfc *number*>

Syntax (MX Series Routers)

show chassis firmware
<all-members>
<local>
<member *member-id*>

Syntax (MX2010 3D Universal Edge Routers)

show chassis firmware

Syntax (MX2020 3D Universal Edge Routers)

show chassis firmware

Syntax (QFX Series)

show chassis firmware
interconnect-device *name*
node-device *name*

Syntax (ACX Series Universal Access Routers)

show chassis firmware

Syntax (EX Series Switches)

show chassis firmware
<detail>

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.

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, and EX4200 switches, and the QFX Series, 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 T1600 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 (or 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 T1600 router (or line-card chassis) that is connected to the TX Matrix Plus router. Replace ***number*** with a value from **0** through **3**.

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.

scc—(TX Matrix router only) (Optional) Display version levels for the firmware on the TX Matrix router (or 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

Related Documentation

- Upgrading the HSM Firmware

List of Sample Output

Output Fields

Table 62 on page 838 lists the output fields for the **show chassis firmware** command. Output fields are listed in the approximate order in which they appear.

Table 62: 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	(*detail* 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.
Boot	(*detail* option only) Version of the SYSPLD.
PoE	(*detail* option only) Version of the PoE firmware.

Table 62: show chassis firmware Output Fields *(continued)*

Field Name	Field Description
PFE-*<number>*	(*detail* option only) Version of the PFE used in the switch.
PHY-	(*detail* option only) Version of the physical layer device (PHY) used in the switch.
microcode	(*detail* option only) Microcode of the physical layer devices (PHY) used in the switch.
uboot	(*detail* option only) Version of the u-boot used in the switch.
loader	(*detail* 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 tlim 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 smackie on 2000-02-29 2
FPC 1                    ROM        Juniper ROM Monitor Version 3.0b1
                         O/S        Version 3.4I4 by smackie on 2000-02-25 21
FPC 2                    ROM        Juniper ROM Monitor Version 3.0b1
                         O/S        Version 3.4I4 by smackie on 2000-02-25 21
```

show chassis firmware (M40 Router)

```
user@host> show chassis firmware
Part                     Type       Version
System control board     ROM        Juniper ROM Monitor Version 2.0i126Copyri
                         O/S        Version 2.0i1 by root on Thu Jul 23 00:51
FPC 5                    ROM        Juniper ROM Monitor Version 2.0i49Copyrig
                         O/S        Version 2.0i1 by root on Thu Jul 23 00:59
```

show chassis firmware (M120 Router)

```
user@host> show chassis firmware
FPC 2                    ROM        Juniper ROM Monitor Version 8.0b29
                         O/S        Version 8.2B1 by builder on 2006-10-18 16:2
FPC 3                    ROM        Juniper ROM Monitor Version 8.0b29
                         O/S        Version 8.2B1 by builder on 2006-10-18 16:2
FPC 4                    ROM        Juniper ROM Monitor Version 8.0b29
                         O/S        Version 8.2B1 by builder on 2006-10-18 16:2
FEB 3                    ROM        Juniper ROM Monitor Version 8.0b29
                         O/S        Version 8.2B1 by builder on 2006-10-18 16:1
FEB 4                    ROM        Juniper ROM Monitor Version 8.0b29
                         O/S        Version 8.2B1 by builder 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 tlim on 2000-02-29 11:50
SFM 1                    ROM        Juniper ROM Monitor Version 4.0b2
                         O/S        Version 4.0I1 by tlim on 2000-02-29 11:50
FPC 0                    ROM        Juniper ROM Monitor Version 4.0b2
                         O/S        Version 4.0I1 by tlim on 2000-02-29 11:56
FPC 1                    ROM        Juniper ROM Monitor Version 4.0b2
                         O/S        Version 4.0I1 by tlim on 2000-02-29 11:56
FPC 2                    ROM        Juniper ROM Monitor Version 4.0b3
                         O/S        Version 4.0I1 by tlim on 2000-02-29 11:56
```

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 builder on 2008-0
FPC 2                    ROM        Juniper ROM Monitor Version 8.3b1
                         O/S        Version 9.0-20080103.0 by builder 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 builder 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 artem on 2006-10-31 19:22
FPC 7                    ROM        Juniper ROM Monitor Version 8.2b1
                         O/S        Version 8.2-20061026.1 by builder on 2006-1
```

show chassis firmware (MX2010 Router)

```
user@host> show chassis firmware
Part                     Type       Version
FPC 0                    ROM        Juniper ROM Monitor Version 10.0b39
                         O/S        Version 12.3-20120718_ib_12_3_psd.0 by buil
FPC 1                    ROM        Juniper ROM Monitor Version 10.4b1
                         O/S        Version 12.3-20120718_ib_12_3_psd.0 by buil
FPC 8                    ROM        Juniper ROM Monitor Version 10.1b2
                         O/S        Version 12.3-20120718_ib_12_3_psd.0 by buil
FPC 9                    ROM        Juniper ROM Monitor Version 10.0b39
                         O/S        Version 12.3-20120718_ib_12_3_psd.0 by buil
SPMB 0                   ROM        Juniper ROM Monitor Version 12.1b1
                         O/S        Version 12.3-20120718_ib_12_3_psd.0 by buil
SPMB 1                   ROM        Juniper ROM Monitor Version 12.1b1
                         O/S        Version 12.3-20120718_ib_12_3_psd.0 by buil
```

show chassis firmware (MX2020 Router)

```
user@host> show chassis firmware
Part                     Type       Version
FPC 0
FPC 1
FPC 2
FPC 3
FPC 4
FPC 5
FPC 6
FPC 7
FPC 8
FPC 9
FPC 10
FPC 11
FPC 12
FPC 13
FPC 14
FPC 15
FPC 16
FPC 17
FPC 18
FPC 19
SPMB 0                   ROM        Juniper ROM Monitor Version 11.2b1
                         O/S        Version 12.3I5 by psampath on 2012-11-04 03
SPMB 1                   ROM        Juniper ROM Monitor Version 12.1b1
                         O/S        Version 12.3I5 by psampath on 2012-11-04 03
```

show chassis firmware

```
user@host> show chassis firmware
```

(MX240, MX480, MX960 Router with

```
Part                    Type       Version
FPC 1                   ROM        Juniper ROM Monitor Version 12.1b1
                        O/S        Version 12.2I21 by manish on 2012-06-19 17:
```


Application Services Modular Line Card)

show chassis firmware (EX4200 Switch)

```
user@switch> show chassis firmware

Part                    Type       Version
FPC 0                   uboot      U-Boot 1.1.6 (Feb  6 2008 - 11:27:42)
                        loader     FreeBSD/PowerPC U-Boot bootstrap loader 2.1
FPC 1                   uboot      U-Boot 1.1.6 (Feb  6 2008 - 11:27:42)
                        loader     FreeBSD/PowerPC U-Boot bootstrap loader 2.1
FPC 2                   uboot      U-Boot 1.1.6 (Feb  6 2008 - 11:27:42)
                        loader     FreeBSD/PowerPC U-Boot bootstrap loader 2.1
```

show chassis firmware (EX8200 Switch)

```
user@switch> show chassis firmware

Part                     Type       Version
FPC 0                    U-Boot     U-Boot 1.1.6 (Mar 25 2009 - 06:13:12) 2.4.0
                         loader     FreeBSD/PowerPC U-Boot bootstrap loader 2.2
FPC 3                    U-Boot     U-Boot 1.1.6 (Dec  4 2009 - 13:17:34) 3.1.0
                         loader     FreeBSD/PowerPC U-Boot bootstrap loader 2.2
FPC 5                    U-Boot     U-Boot 1.1.6 (Mar 25 2009 - 06:13:12) 2.4.0
                         loader     FreeBSD/PowerPC U-Boot bootstrap loader 2.2
FPC 7                    U-Boot     U-Boot 1.1.6 (Feb  6 2009 - 05:31:46) 2.4.0
                         loader     FreeBSD/PowerPC U-Boot bootstrap loader 2.2
Routing Engine 0         U-Boot     U-Boot 1.1.6 (Mar 25 2009 - 06:13:12) 2.4.0
                                    FreeBSD/PowerPC U-Boot bootstrap loader 2.2
                         loader
Routing Engine 1         U-Boot     U-Boot 1.1.6 (Mar 25 2009 - 06:13:12) 2.4.0
                         loader     FreeBSD/PowerPC U-Boot bootstrap loader 2.2
```

show chassis firmware 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 builder on 2004-0
FPC 2                    ROM        Juniper ROM Monitor Version 6.4b20
                         O/S        Version 7.0-20040804.0 by builder on 2004-0
SPMB 0                   ROM        Juniper ROM Monitor Version 6.4b18
                         O/S        Version 7.0-20040804.0 by builder 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 builder 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 builder on 2009-0
SPMB 1                    ROM        Juniper ROM Monitor Version 9.5b1
                          O/S        Version 9.6-20090507.0 by builder on 2009-0

lcc0-re1:
--------------------------------------------------------------------------
Part                      Type       Version
FPC 4                     ROM        Juniper ROM Monitor Version 9.0b2
                          O/S        Version 9.6-20090507.0 by builder on 2009-0
FPC 6                     ROM        Juniper ROM Monitor Version 9.0b2
                          O/S        Version 9.6-20090507.0 by builder on 2009-0
FPC 7                     ROM        Juniper ROM Monitor Version 9.0b2
                          O/S        Version 9.6-20090507.0 by builder on 2009-0
SPMB 0                    ROM        Juniper ROM Monitor Version 9.5b1
                          O/S        Version 9.6-20090507.0 by builder on 2009-0
SPMB 1                    ROM        Juniper ROM Monitor Version 9.5b1
                          O/S        Version 9.6-20090507.0 by builder on 2009-0

lcc1-re1:
--------------------------------------------------------------------------
Part                      Type       Version
FPC 4                     ROM        Juniper ROM Monitor Version 9.0b2
                          O/S        Version 9.6-20090507.0 by builder on 2009-0
FPC 6                     ROM        Juniper ROM Monitor Version 9.0b2
                          O/S        Version 9.6-20090507.0 by builder on 2009-0
FPC 7                     ROM        Juniper ROM Monitor Version 9.0b2
                          O/S        Version 9.6-20090507.0 by builder on 2009-0
SPMB 0                    ROM        Juniper ROM Monitor Version 9.5b1
                          O/S        Version 9.6-20090507.0 by builder on 2009-0
SPMB 1                    ROM        Juniper ROM Monitor Version 9.5b1
                          O/S        Version 9.6-20090507.0 by builder on 2009-0

lcc2-re1:
--------------------------------------------------------------------------
Part                      Type       Version
FPC 4                     ROM        Juniper ROM Monitor Version 9.0b2
                          O/S        Version 9.6-20090507.0 by builder on 2009-0
FPC 5                     ROM        Juniper ROM Monitor Version 9.0b2
                          O/S        Version 9.6-20090507.0 by builder on 2009-0
FPC 6                     ROM        Juniper ROM Monitor Version 9.0b2
                          O/S        Version 9.6-20090507.0 by builder on 2009-0
FPC 7                     ROM        Juniper ROM Monitor Version 7.5b4
                          O/S        Version 9.6-20090507.0 by builder on 2009-0
SPMB 0                    ROM        Juniper ROM Monitor Version 9.5b1
                          O/S        Version 9.6-20090507.0 by builder on 2009-0
SPMB 1                    ROM        Juniper ROM Monitor Version 9.5b1
                          O/S        Version 9.6-20090507.0 by builder on 2009-0
```



```
lcc3-re1:
--------------------------------------------------------------------------
Part                      Type       Version
FPC 0                     ROM        Juniper ROM Monitor Version 9.0b2
                          O/S        Version 9.6-20090507.0 by builder on 2009-0
FPC 1                     ROM        Juniper ROM Monitor Version 9.0b2
                          O/S        Version 9.6-20090507.0 by builder on 2009-0
FPC 2                     ROM        Juniper ROM Monitor Version 9.0b2
                          O/S        Version 9.6-20090507.0 by builder on 2009-0
FPC 4                     ROM        Juniper ROM Monitor Version 7.5b4
                          O/S        Version 9.6-20090507.0 by builder on 2009-0
FPC 5                     ROM        Juniper ROM Monitor Version 9.0b2
                          O/S        Version 9.6-20090507.0 by builder on 2009-0
FPC 7                     ROM        Juniper ROM Monitor Version 9.0b2
                          O/S        Version 9.6-20090507.0 by builder on 2009-0
SPMB 0                    ROM        Juniper ROM Monitor Version 9.5b1
                          O/S        Version 9.6-20090507.0 by builder on 2009-0
SPMB 1                    ROM        Juniper ROM Monitor Version 9.5b1
                          O/S        Version 9.6-20090507.0 by builder 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 builder on 2009-0
FPC 6                     ROM        Juniper ROM Monitor Version 9.0b2
                          O/S        Version 9.6-20090507.0 by builder on 2009-0
FPC 7                     ROM        Juniper ROM Monitor Version 9.0b2
                          O/S        Version 9.6-20090507.0 by builder on 2009-0
SPMB 0                    ROM        Juniper ROM Monitor Version 9.5b1
                          O/S        Version 9.6-20090507.0 by builder on 2009-0
SPMB 1                    ROM        Juniper ROM Monitor Version 9.5b1
                          O/S        Version 9.6-20090507.0 by builder 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 builder on 2009-0
SPMB 1                    ROM        Juniper ROM Monitor Version 9.5b1
                          O/S        Version 9.6-20090507.0 by builder on 2009-0
```

show chassis firmware (QFX 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 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 jisjoy on 2012-05-29 06:
FEB                     O/S        Version 12.2I13 by jisjoy 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 manish 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 J Series and Branch SRX Series Services Gateways.

Options This command has no options.

Required Privilege Level view

Related Documentation

- show chassis feb on page 832
- request chassis feb on page 389
- Configuring FEB Redundancy on the M120 Router
- CFEB Overview

List of Sample Output show chassis forwarding on page 848

Output Fields Table 63 on page 847 lists the output fields for the **show chassis forwarding** command. Output fields are listed in the approximate order in which they appear.

Table 63: show chassis forwarding Output Fields

Field Name	Field Description

FWWD status	Forwarding status:
	• **State**:
	  ◦ **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

Syntax

show chassis fpc
<detail <*slot*>> | <pic-status <*slot*>>

Syntax (EX Series Switches)

show chassis fpc
<detail <*fpc-slot*>> | <pic-status <*fpc-slot*>>
<*fpc-slot*>

Syntax (T4000 Routers)

show chassis fpc
<detail <*fpc-slot*>>
<pic-status <*fpc-slot*>>

Syntax (TX Matrix and TX Matrix Plus Routers)

show chassis fpc
<detail <*fpc-slot*>> | <pic-status <*fpc-slot*>>
<*slot*>

Syntax (MX Series Routers)

show chassis fpc
<detail <*slot*>> | <pic-status <*slot*>>
<all-members>
<local>
<member *member-id*>

Syntax (MX2010 3D Universal Edge Routers)

show chassis fpc
<*slot*> detail | <detail <*slot*>> | <pic-status <*slot*>>
<*fpc-slot*>

Syntax (MX2020 3D Universal Edge Routers)

show chassis fpc
< *slot*> detail | <detail <*slot*>> | <pic-status <*slot*>>
<*fpc-slot*>

Syntax (QFX Series)

show chassis fpc
<detail>
<interconnect-device *name* <fpc-slot *fpc-slot*>>
<node-device *name*>

Syntax (PTX Series Packet Transport Switches)

show chassis fpc
<detail <*fpc-slot*>> | <pic-status <*fpc-slot*>>
<*fpc-slot*>

Syntax (ACX Series Universal Access Routers)

show chassis fpc
<detail <*fpc-slot*>> | <pic-status <*fpc-slot*>>
<*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 12.1 for PTX Series Packet Transport Switches.
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.

Description Display status information about the installed Flexible PIC Concentrators (FPCs)and PICs.

Options **none**—Display status information for all FPCs. On a TX Matrix router, display status information for all FPCs on the attached T640 routers in the routing matrix. On a TX Matrix Plus router, display status information for all FPCs on the attached T1600 routers in the routing matrix.

NOTE: In EX8200 switches, line cards initialize Packet Forwarding Engine during startup. If an error occurs during hardware initialization, the FPCs with bad hardware parts power down after transferring the debug information to the Routing Engine. The Routing Engine marks the FPC offline, logs the error in system log messages (/var/log/messages), and generates an alarm to inform the user.

See the following sample output:

```
user@host> show chassis fpc
                     Temp  CPU Utilization (%)   Memory
Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap
  Buffer
  0  Empty
  1  Empty
  2  Empty
  3  Empty
  4  Empty
  5  Offline         ---Hard FPC error---
  6  Empty
  7  Online            26      4          0       1024        0
     32
```

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
                     Temp  CPU Utilization (%)   Memory
Utilization (%)
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 only) (Optional) Display status information for all FPCs on all members of the Virtual Chassis configuration.

interconnect-device *name*—(QFabric systems only) (Optional) Display status information for all FPCs on the Interconnect device.

fpc-slot—(Optional) FPC slot number:

- (TX Matrix and TX Matrix Plus router only—On a TX Matrix router, if you specify the number of the T640 router (or 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 T1600 router (or 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**.
- 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:
  - QFX3500 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 Switch—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 only) (Optional) Display status information for all FPCs on the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

node-device ***name***—(QFabric systems only) (Optional) Display status information for each Node device. Each Node device is equivalent to an FPC.

pic-status—(Optional) Display status information for all PICs or for the PIC in the specified slot (see ***fpc-slot***).

NOTE: On T1600 routers, Type 4 FPCs with ASICs based on the SL2.0 chipset do not support the 10-Gigabit Ethernet LAN/WAN PIC with SFP+ (10x10GE [LAN/WAN] SFPP). If you issue the **show chassis fpc** command with the **pic-status** option, the CLI displays the string "Not Supported" for 10x10GE(LAN/WAN) SFPP PICs installed on such FPCs. The following is a sample output:

```
user@host> show chassis fpc pic-status
Slot 0   Online        E2-FPC Type 1
  PIC 0  Online        1x G/E SFP, 1000 BASE
  PIC 1  Online        Adaptive Services-II
  PIC 2  Online        1x G/E IQ, 1000 BASE
  PIC 3  Online        1x G/E IQ, 1000 BASE
Slot 1   Online        FPC Type 3-ES
  PIC 0  Present       UNUSED- Not Supported
Slot 2   Online        FPC Type 4-ES
  PIC 0  Offline       4x OC-192 SONET XFP
  PIC 1  Present       10x10GE(LAN/WAN) SFPP- Not Supported
<<<<<<
Slot 4   Offline       FPC Type 1-ES
Slot 5   Offline       FPC Type 2-ES
Slot 6   Online        E2-FPC Type 3
  PIC 0  Online        1x OC-192 SONET XFP
  PIC 1  Online        4x OC-48 SONET
  PIC 2  Online        4x OC-48 SONET
  PIC 3  Online        MultiServices 500
Slot 7   Online        FPC Type 4-ES
  PIC 0  Online        4x 10GE (LAN/WAN) XFP
  PIC 1  Online        4x 10GE (LAN/WAN) XFP
```

In addition, an entry is logged in the system log messages (/var/log/messages) that the PIC is not supported. The following is a sample message logged in the system log:

```
Apr  5 08:47:36  router1 chassisd[2770]: CHASSISD_UNSUPPORTED_PIC:
 PIC 1 in FPC 2 (type 763, version 257) is not supported
```

lcc *number*—(TX Matrix and TX Matrix Plus router only) (Optional) On a TX Matrix router, display status information for a T640 router (or line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display status information for a T1600 router (or line-card chassis) that is connected to the TX Matrix Plus router. Replace ***number*** with a value from **0** through **3**.

Required Privilege Level view

Related Documentation

- request chassis fpc on page 391
- show chassis fpc-feb-connectivity on page 876
- show chassis fabric fpcs on page 714

- Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 125
- MX960 Flexible PIC Concentrator Description
- ACX2000 and ACX2100 Routers Hardware and CLI Terminology Mapping
- enhanced-mode on page 292

List of Sample Output

Output Fields Table 64 on page 855 lists the output fields for the **show chassis fpc** command. Output fields are listed in the approximate order in which they appear.

Table 64: 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:
	• **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 Switches only) One of the following two states is displayed:
	  ◦ **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
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

Table 64: show chassis fpc Output Fields *(continued)*

Field Name	Field Description	Level of Output
Temperature (PTX Series)	On PTX Series Packet Transport Switches, temperature details are provided in degrees Celsius and Fahrenheit. Output includes: • 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 (TL*n*)-–Temperature of the specified Lookup ASIC (TL) of the packet forwarding engine on the FPC. • Temperature (TQ*n*)-–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
Memory DRAM (MB)	Total DRAM, in megabytes, available to the FPC's processor.	none specified
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 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**

Table 64: show chassis fpc Output Fields *(continued)*

Field Name	Field Description	Level of Output
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
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) 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 (MX240 Router)

```
user@host> show chassis fpc
               Temp     CPU Utilization (%)     Memory      Utilization (%)
Slot State             (C)   Total  Interrupt      DRAM (MB) Heap      Buffer
  0  Empty
  1  Online             34     6           0       1024       18          30
  2  Online             33     9           0       1024       24          30
```

show chassis fpc (MX480 Router)

```
user@host> show chassis fpc
                     Temp  CPU Utilization (%)    Memory    Utilization (%)
Slot State             (C)   Total  Interrupt      DRAM (MB) Heap      Buffer
  0  Empty
  1  Online             36     9           0       1024       17          57
  2  Empty
  3  Empty
  4  Empty
  5  Empty
```

show chassis fpc (MX480 Router with 100-Gigabit Ethernet CFP)

```
user@host> show chassis fpc
       Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State      (C)  Total  Interrupt      DRAM (MB) Heap      Buffer
 0  Online      33   4      0              2048      10        13
 1  Online      36   7      0              2048      16        13
 2  Online      29   6      0              1024      27        29
 3  Online      33   0      0                 0       0         0
 4  Online      36   7      0              2048      19        13
 5  Online      34   31      11             2048      14        13
```

show chassis fpc pic-status (MX480 Router with

```
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
```

100-Gigabit Ethernet CFP)

```
  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 (MX960 Router)

```
user@host> show chassis fpc
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
 0  Empty
 1  Empty
 2  Empty
 3  Online            25     19          0        1024       15         57
 4  Empty
 5  Online            26     27          0        1024       15         57
 6  Empty
 7  Empty
 8  Empty
 9  Empty
 10  Empty
 11  Empty
```

show chassis fpc (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

```
user@host>show chassis fpc 1 detail
Slot 1 information:
  State                                   Online
  Temperature                          34
```

Application Services Modular Line Card

```
  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 (MX2010 Routers)

```
user@host show chassis fpc
     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
  0  Online           34      9          0        2048        18          13
  1  Online           32      9          0        2048        15          13
  2  Empty
  3  Empty
  4  Empty
  5  Empty
  6  Empty
  7  Empty
  8  Online           31     13          0        2048        11          13
  9  Online           33     10          0        2048        18          13
```

show chassis fpc (MX2020 Routers)

```
user@host show chassis fpc
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
  0  Online           10     12          0        2048        18          13
  1  Online            8      9          0        2048        18          13
  2  Online            7      9          0        2048        18          13
  3  Online            8     10          0        2048        18          13
  4  Online            9     10          0        2048        18          13
  5  Online            8      9          0        2048        18          13
  6  Online            8     10          0        2048        18          13
  7  Online            9      9          0        2048        18          13
  8  Online            9     10          0        2048        18          13
  9  Online           10      9          0        2048        18          13
 10  Online           16      8          0        2048        18          13
 11  Online           11     10          0        2048        18          13
 12  Online           10     10          0        2048        18          13
 13  Online           11      9          0        2048        18          13
 14  Online           12     10          0        2048        18          13
 15  Online           13      9          0        2048        18          13
 16  Online           13      9          0        2048        18          13
 17  Online           12      9          0        2048        18          13
 18  Online           12      8          0        2048        18          13
 19  Online           14     10          0        2048        18          13
```

show chassis fpc 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

```
user@host> show chassis fpc
show chassis fpc
```

(Hardware Not Supported)

```
                    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

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
```

Application Services Modular Line Card)

```
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:
--------------------------------------------------------------------------
                     Temp  CPU      Utilization (%)  Memory    Utilization (%)
Slot State        (C)  Total  Interrupt     DRAM (MB)      Heap   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:
--------------------------------------------------------------------------
                        Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State               (C)  Total  Interrupt      DRAM (MB) 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:
--------------------------------------------------------------------------
                        Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State               (C)  Total  Interrupt      DRAM (MB) 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:
--------------------------------------------------------------------------
                        Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State               (C)  Total  Interrupt      DRAM (MB) 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:
--------------------------------------------------------------------------
                        Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State               (C)  Total  Interrupt      DRAM (MB) 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

lcc2-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

lcc3-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**

```
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) 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 slot (T1600 Router)

user@host> **show chassis fpc slot 2**

```
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (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**

```
regress@stymphalian# run show chassis fpc
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  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 System)

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 System)

```
user@switch> show chassis fpc interconnect-device interconnect1 3
FPC status:
                     Temp
Slot State            (C)
  3  Online            0
```

show chassis fpc interconnect-device detail (QFabric System)

```
user@switch> show chassis fpc interconnect-device interconnect1 3 detail
Slot 3 information:
  State                                 Online
  Temperature                        0 degrees C / 32 degrees F
  Start time                            2011-08-18 10:45:04 PDT
  Uptime                                1 minute, 49 seconds
```

show chassis fpc pic-status

```
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+
```

interconnect-device (QFabric System)

```
  PIC 1   Online       16x 40G-GE
Slot 1    Online       QFX 16-port QSFP+ Front Card
  PIC 0   Online       16x 40G-QSFP+
 PIC 1  Online        16x 40G-GE
Slot 2    Online       QFX 16-port QSFP+ Front Card
  PIC 0   Online       16x 40G-QSFP+
  PIC 1   Online       16x 40G-GE
Slot 3    Online       QFX 16-port QSFP+ Front Card
  PIC 0   Online       16x 40G-QSFP+
  PIC 1   Online       16x 40G-GE
Slot 4    Online       QFX 16-port QSFP+ Front Card
  PIC 0   Online       16x 40G-QSFP+
  PIC 1   Online       16x 40G-GE
Slot 5    Online       QFX 16-port QSFP+ Front Card
  PIC 0   Online       16x 40G-QSFP+
  PIC 1   Online       16x 40G-GE
Slot 6    Online       QFX 16-port QSFP+ Front Card
  PIC 0   Online       16x 40G-QSFP+
  PIC 1   Online       16x 40G-GE
Slot 7    Online       QFX 16-port QSFP+ Front Card
  PIC 0   Online       16x 40G-QSFP+
  PIC 1   Online       16x 40G-GE
Slot 8    Online       QFX Fabric Rear Card
  PIC 0   Online       16x 40G-GE
Slot 9    Online       QFX Fabric Rear Card
  PIC 0   Online       16x 40G-GE
Slot 10   Online       QFX Fabric Rear Card
  PIC 0   Online       16x 40G-GE
Slot 11   Online       QFX Fabric Rear Card
  PIC 0   Online       16x 40G-GE
Slot 12   Online       QFX Fabric Rear Card
  PIC 0   Online       16x 40G-GE
Slot 13   Online       QFX Fabric Rear Card
  PIC 0   Online       16x 40G-GE
Slot 14   Online       QFX Fabric Rear Card
  PIC 0   Online       16x 40G-GE
Slot 15   Online       QFX Fabric Rear Card
  PIC 0   Online       16x 40G-GE
```

show chassis fpc pic-status node-device (QFabric System)

```
user@switch> show chassis fpc pic-status node-device node1
Slot node1 Online       QFX 48x10G 4x40G Switch
  PIC 0   Online       48x 10G-SFP+
  PIC 1   Online       4x 40G-QSFP+
```

show chassis fpc (PTX5000 Packet Transport Switch)

```
user@host> show chassis fpc
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  Total  Interrupt      DRAM (MB) Heap      Buffer
  0  Empty
  1  Empty
  2  Online            50      6          0       2816         5          27
  3  Empty
  4  Empty
  5  Online            48      9          0       2816         5          27
  6  Empty
  7  Online            49      8          0       2816         5          27
```

show chassis fpc detail

```
user@host> show chassis fpc detail
Slot 2 information:
```

(PTX5000 Packet Transport Switch)

```
  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

```
user@host> show chassis fpc pic-status
Slot 2   Online        FPC
  PIC 0  Online        24x 10GE(LAN) SFP+
```


Packet Transport Switch)

```
  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
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  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
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State            (C)  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
                  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 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-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

- request chassis fpc on page 391
- show chassis fpc on page 849
- show chassis fabric fpcs on page 714
- Configuring the Junos OS to Resynchronize FPC Sequence Numbers with Active FPCs when an FPC Comes Online on page 125
- MX960 Flexible PIC Concentrator Description

List of Sample Output show chassis fpc-feb-connectivity on page 877

Output Fields Table 65 on page 876 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 65: 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	State of the FPC. State can be any of the following: • **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 65: show chassis fpc-feb-connectivity Output Fields *(continued)*

Field Name	Field Description
FEB state	State of the FEB. State can be any of the following: • **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	Status of the link connecting the R-FEB and R-FPC: • **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

Syntax

show chassis hardware
<detail | extensive>
<clei-models>
<models>

Syntax (EX Series)

show chassis hardware
<clei-models>
<detail | extensive>
<models>

Syntax (T4000 Router)

show chassis hardware
<clei-models>
<detail | extensive>
<models>

Syntax (TX Matrix Router)

show chassis hardware
<clei-models>
<detail | extensive>
<models>
<lcc *number* | scc>

Syntax (TX Matrix Plus Router)

show chassis hardware
<clei-models>
<detail | extensive>
<models>
<lcc *number* | sfc *number*>

Syntax (MX Series Routers)

show chassis hardware
<detail | extensive>
<clei-models>
<models>
<all-members>
<local>
<member *member-id*>

Syntax (MX2010 3D Universal Edge Routers)

show chassis hardware
<clei-models>
<detail | extensive>
<models>

Syntax (MX2020 3D Universal Edge Routers)

show chassis hardware
<clei-models>
<detail | extensive>
<models>

Syntax (QFX Series)

show chassis hardware
<detail | extensive>
<clei-models>
<interconnect-device *name*>
<node-device *name*>
<models>

Syntax (PTX Series Packet Transport Switches)

show chassis hardware
<detail | extensive>
<clei-models>
<models>

Syntax (ACX Series Universal Access Routers)

show chassis hardware
<detail | extensive>
<clei-models>
<models>

Release Information

Command introduced before Junos OS Release 7.4.
models option introduced in Junos OS Release 8.2.
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 QFX Series.
Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Switches.
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.

Description

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.

In the EX Series switch command output, FPC refers to the following:

- On EX2200 switches, EX3200 switches, EX4200 standalone switches, and EX4500 switches—Refers to the switch; FPC ***number*** is always 0.
- On EX4200 switches in a Virtual Chassis configuration—Refers to the member of a Virtual Chassis; FPC ***number*** equals the member ID, from 0 through 9.
- On EX8208 and EX8216 switches—Refers to a line card; FPC ***number*** equals the slot number for the line card.

On a QFX3500 standalone switch, both the FPC and FPC ***number*** are always **0**.

On Type 5 FPC on T4000 routers, there are no **top temperature sensor** or **bottom temperature sensor** parameters. Instead, **fan intake temperature sensor** and **fan exhaust temperature sensors** parameters are displayed.

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 T1600 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 and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display hardware 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 hardware information for a specified T1600 router (or line-card chassis) that is connected to the TX Matrix Plus router. Replace ***number*** with a value from **0** through **3**.

local—(MX Series routers only) (Optional) Display hardware-specific information for the local Virtual Chassis members.

member ***member-id***—(MX Series routers only) (Optional) Display hardware-specific information for the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 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.

scc—(TX Matrix router only) (Optional) Display hardware information for the TX Matrix router (or switch-card chassis).

sfc ***number***—(TX Matrix Plus router only) (Optional) Display hardware information for the TX Matrix Plus router (or switch-fabric chassis). Replace *number* with **0**.

Additional Information The **show chassis hardware detail** command now displays DIMM information for the following Routing Engines:

Table 66: 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

Required Privilege Level view

Related Documentation

- show chassis power on page 1012

List of Sample Output

show chassis hardware (EX8216 Switch) on page 886
show chassis hardware clei-models (EX8216 Switch) on page 887
show chassis hardware clei-models (T1600 Router) on page 887
show chassis hardware detail (EX4200 Switch) on page 888
show chassis hardware models (EX4500 Switch) on page 888
show chassis hardware (J6350 Router) on page 888
show chassis hardware (J6300 Router) on page 888

show chassis hardware (T4000 Router) on page 947
show chassis hardware (T4000 Router with 16 GB line card chassis (LCC) Routing Engine) on page 949
show chassis hardware clei-models (T4000 Router) on page 950
show chassis hardware detail (T4000 Router) on page 950
show chassis hardware models (T4000 Router) on page 952
show chassis hardware lcc (TX Matrix Router) on page 953
show chassis hardware scc (TX Matrix Router) on page 954
show chassis hardware (T1600 Router) on page 954
show chassis hardware (TX Matrix Plus Router) on page 956
show chassis hardware sfc (TX Matrix Plus Router) on page 961
show chassis hardware extensive (TX Matrix Plus Router) on page 962
show chassis hardware clei-models (TX Matrix Plus Router) on page 964
show chassis hardware detail (TX Matrix Plus Router) on page 966
show chassis hardware models (TX Matrix Plus Router) on page 968
show chassis hardware (16-Port 10-Gigabit Ethernet MPC with SFP+ Optics [MX Series Routers]) on page 970
show chassis hardware (MPC3E [MX Series Routers]) on page 971
show chassis hardware (QFX3500 Switches) on page 972
show chassis hardware detail (QFX3500 Switches) on page 972
show chassis hardware models (QFX3500 Switches) on page 974
show chassis hardware clei-models (QFX3500 Switches) on page 974
show chassis hardware interconnect-device (QFabric Systems) on page 974
show chassis hardware node-device (QFabric Systems) on page 974
show chassis hardware (PTX5000 Packet Transport Switch) on page 974
show chassis hardware clei-models (PTX5000 Packet Transport Switch) on page 975
show chassis hardware detail (PTX5000 Packet Transport Switch) on page 976
show chassis hardware models (PTX5000 Packet Transport Switch) on page 978
show chassis hardware extensive (PTX5000 Packet Transport Switch) on page 978
show chassis hardware (MX Routers with Media Services Blade [MSB]) on page 979
show chassis hardware extensive (MX Routers with Media Services Blade [MSB]) on page 979

Output Fields Table 67 on page 883 lists the output fields for the **show chassis hardware** command. Output fields are listed in the approximate order in which they appear.

Table 67: show chassis hardware Output Fields

Field Name	Field Description	Level of Output
Item	Chassis component: • (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 EX Series Switches Hardware and CLI Terminology Mapping. • (MX Series routers)—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). • (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, 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
Assb ID or **Assembly ID**	(**extensive** keyword only) Identification number that describes the FRU hardware.	**extensive**

Table 67: show chassis hardware Output Fields *(continued)*

Field Name	Field Description	Level of Output
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	Brief description of the hardware item: • 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**. On EX Series switches, a brief description of the FPC. On the J Series routers, the FPC type corresponds to the Physical Interface Module (PIM). The following list shows the PIM abbreviation in the output and the corresponding PIM name. ◦ **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) ◦ **4x GE Base PIC**—Four built-in Gigabit Ethernet ports on a J4350 or J6350 chassis (fixed PIM) ◦ **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 67: show chassis hardware Output Fields *(continued)*

Field Name	Field Description	Level of Output
	◦ **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, 4xFXO, 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 M 16x 10GE**—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). • 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                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-1OC48-SON-SMSR
  PIC 2          REV 14   750-001901                    PB-4OC12-SON-SMIR
  PIC 3          REV 07   750-001900                    PB-1OC48-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-4OC48-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-4OC48-SON-SFP
  PIC 3          REV 32   750-003700                    PC-1OC192-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-4OC192-SON-XFP
  PIC 1          REV 01   750-010850                    PD-1OC768-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 detail (EX4200 Switch)

```
user@host> show chassis hardware detail
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                BM0208327733      EX4200-24T
Routing Engine 0 REV 11   750-021256   BM0208327733      EX4200-24T, 8 POE
Routing Engine 0                       BM0208327733      EX4200-24T, 8 POE
FPC 0            REV 11   750-021256   BM0208327733      EX4200-24T, 8 POE
  CPU                     BUILTIN      BUILTIN           FPC 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                                                 Fan Tray
```

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 (J6350 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN1090E07ADB      JSR6350
Midplane         REV 03   710-014593   NP1265
System IO        REV 01   710-016210   NN9950            JX350 System IO
Crypto Module                                            Crypto Acceleration
Routing Engine   REV 08   710-015273   NM6509            RE-J6350-3400
   ad0      248 MB   256MB CKS           00102006C24A00000039 Compact
Flash
FPC 0                                                    FPC
   PIC 0                                                  4x GE Base PIC
FPC 1            REV 06   750-010355   AI07030023        FPC
   PIC 0                                                  2x T1
FPC 3            REV 06   750-011148   AJ06520151        FPC
   PIC 0                                                  2x E1
FPC 6            REV 06   750-013492   NC4170            FPC
   PIC 0                                                  4x FE
Power Supply 0
```


show chassis hardware (J6300 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN000164AB        J6300
Midplane         REV 02.04 710-010001  CORE99570
System IO        REV 02.00 710-010003  CORE100848        System IO board
Routing Engine   RevX2.6   750-010006  IWGS40735390      RE-J.3
FPC 0                                                    FPC
  PIC 0                                                  2x FE
FPC 1            RevX2.0   750-011380  N3960005          FPC
  PIC 0                                                  1xADSL pic Annex A
FPC 2            RevX2.0   750-011380  N3960002          FPC
  PIC 0                                                  1xADSL pic Annex B
FPC 3            REV 03    750-010354  N0780028          FPC
  PIC 0                                                  1x T3
```

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

```
user@host> show chassis hardware
Hardware inventory:
```


(M10 Router)

```
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-4OC3-SON-MM
  PIC 1          REV 11   750-002992                     PE-4FE-TX
  PIC 2          REV 03   750-002977                     PE-2OC3-ATM-MM
  PIC 3          REV 08   750-005724                     PE-2OC3-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-2OC3-ATM-MM
Fan Tray 0                                                   FANTRAY-F-M20-S
Fan Tray 1                                                   FANTRAY-F-M20-S
Fan Tray 2                                                   FANTRAY-F-M20-S
Fan Tray 3                                                   FANTRAY-R-M20-S
```

show chassis hardware (M40 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item              Version   Part number   Serial number      Description
Backplane         REV 02    710-000073    S/N AA0053
Power supply A    Rev 2     740-000235    S/N 000042         DC
Maxicab           REV X1    710-000229    S/N AA0139
Minicab           REV X1    710-000482    S/N AA0201
Display           REV 06    710-000150    S/N AA0905
Host                                                         cpv5000
SCB               REV X1    710-000075    S/N AA0158         Internet Processor I
  SSRAM bank 0    REV 02    710-000077    S/N AA2267         1 MB
  SSRAM bank 1    REV 02    710-000077    S/N AA2270         1 MB
  SSRAM bank 2    REV 02    710-000077    S/N AA2269         1 MB
  SSRAM bank 3    REV 02    710-000077    S/N AA2268         1 MB
FPC 0             REV 01    710-000175    S/N AA0048
  SSRAM           REV 01    710-000077    S/N AA2333         1 MB
  SDRAM bank 0    REV 01    710-000099    S/N AA2332         64 MB
  SDRAM bank 1    REV X1    710-000099    S/N AA2337         64 MB
  PIC 0           REV 04    750-000613    S/N aa0343         1x OC-12 SONET, SMIR
  PIC 1           REV 04    750-000613    S/N AA0379         1x OC-12 SONET, SMIR
  PIC 2           REV 04    750-000613    S/N AA0377         1x OC-12 SONET, SMIR
  PIC 3           REV 04    750-000613    S/N AA0378         1x Tunnel
FPC 2             REV 01    710-000175    S/N AA0042
  SSRAM           REV 02    710-000077    S/N AA2288         1 MB
  SDRAM bank 0    REV 01    710-000099    S/N AA2331         64 MB
  SDRAM bank 1    REV 01    710-000099    S/N AA2330         64 MB
  PIC 0           REV X1    750-000603    S/N AA0143         4x OC-3 SONET, SMIR
  PIC 1           REV X1    750-000615    S/N AA0149         4x OC-3 SONET, MM
  PIC 2           REV X1    750-000611    S/N AA0148         4x OC-3 SONET, MM
  PIC 3           REV 04    750-000613    S/N AA0330         1x OC-12 SONET, SMIR
FPC 4             REV 01    710-000175    S/N AA0050
  SSRAM           REV 01    710-000077    S/N AA2327         1 MB
```

```
  SDRAM bank 0    REV 01    710-000099    S/N AA2329         64 MB
  SDRAM bank 1    REV 01    710-000099    S/N AA2328         64 MB
  PIC 0           REV 04    750-000613    S/N AA0320         1x OC-12 SONET, SMIR
  PIC 2           REV 05    750-000616    S/N AA1341         1x OC-12 ATM, MM
  PIC 3           REV 08    750-001072    S/N AB2462         1x G/E, 1000 BASE-SX
FPC 5             REV 10    710-000175    S/N AA7663
  SSRAM           REV 01    710-000077    S/N 501590         1 MB
  SDRAM bank 0    REV 01    710-000099    S/N 300949         64 MB
  SDRAM bank 1    REV 01    710-000099    S/N 300868         64 MB
  PIC 1           REV 01    750-001323    S/N AB1670         1x Tunnel
```

show chassis hardware (M40e Router)

```
user@host> show chassis hardware
Hardware inventory:
Item              Version   Part number   Serial number      Description
Chassis                                                      m40e
Midplane          REV 01    710-005071    AX3671
FPM CMB           REV 03    710-001642    AR9074
FPM Display       REV 03    710-001647    AR7331
CIP               REV 04    710-002649    BB4449
PEM 0             Rev 01    740-003787    MC12364            Power Entry Module
PEM 1             Rev 01    740-003787    MC12383            Power Entry Module
PCG 0             REV 07    710-001568    AG1332
PCG 1             REV 07    710-001568    AR3789
Host 0                                    3e000007c8176601   Present
MCS 0             REV 11    710-001226    AN5813
SFM 0 SPP         REV 07    710-001228    AG4676
SFM 0 SPR         REV 05    710-002189    AE4735             Internet Processor II
SFM 1 SPP         REV 07    710-001228    AP1347
SFM 1 SPR         REV 05    710-002189    BE0063             Internet Processor II
FPC 0             REV 01    710-011725    BE0669             M40e-EP-FPC Type 1
  CPU             REV 01    710-004600    BD9504
  PIC 0           REV 03    750-003737    AY3991             4x G/E, 1000 BASE-SX
FPC 1             REV 01    710-005197    BD9842             M40e-FPC Type 2
  CPU             REV 01    710-004600    BB4869
  PIC 0           REV 07    750-001900    AR8278             1x OC-48 SONET, SMSR
FPC 2             REV 02    710-005197    BD9824             M40e-FPC Type 2
  CPU             REV 01    710-004600    BD9531
  PIC 0           REV 03    750-003737    AY3986             4x G/E, 1000 BASE-SX
FPC 4             REV 02    710-005078    BE0664             M40e-FPC Type 1
  CPU             REV 01    710-004600    BD9559
  PIC 0           REV 03    750-001894    AG7963             1x G/E, 1000 BASE-SX
  PIC 2           REV 01    750-002575    AF2472             4x OC-3 SONET, SMIR
FPC 6             REV 02    710-005078    BE0652             M40e-FPC Type 1
  CPU             REV 01    710-004600    BD9607
  PIC 0           REV 02    750-002911    AN2286             4x F/E, 100 BASE-TX
  PIC 2           REV 01    750-002577    AP6345             4x OC-3 SONET, MM
```

show chassis hardware (M120 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item              Version   Part number   Serial number      Description
Chassis                                   JN000054AC         M120
Midplane          REV 01    710-013667    RB4170             M120 Midplane
FPM Board         REV 02    710-011407    CJ9186             M120 FPM Board
FPM Display       REV 02    710-011405    CJ9173             M120 FPM Display
FPM CIP           REV 02    710-011410    CJ9221             M120 FPM CIP
PEM 0             Rev 05    740-011936    RM28320            AC Power Entry Module
PEM 1             Rev 05    740-011936    RM28321            AC Power Entry Module
Routing Engine 0  REV 03    740-014080    1000642883         RE-A-1000
CB 0              REV 03    710-011403    CM8346             M120 Control Board
CB 1              REV 06    710-011403    CP6728             M120 Control Board
```



```
FPC 1            REV 02   710-015908   CP6925           M120 CFPC 10GE
  PIC 0                   BUILTIN      BUILTIN          1x 10GE(LAN/WAN) XFP
    Xcvr 0       REV 01   740-014279   62E204N00007     XFP-10G-LR
FPC 3            REV 03   710-011393   CJ9234           M120 FPC Type 2
  PIC 0          REV 16   750-008155   NB5229           2x G/E IQ, 1000 BASE
    Xcvr 0       REV 01   740-011613   P9F15JB          SFP-SX
    Xcvr 1       REV 01   740-007326   P4Q0R9G          SFP-SX
  PIC 1          REV 09   750-007745   CG4360           4x OC-3 SONET, SMIR
  PIC 2          REV 16   750-008155   ND7787           2x G/E IQ, 1000 BASE
    Xcvr 0       REV 01   740-011613   P9F12AS          SFP-SX
    Xcvr 1       REV 01   740-011613   P9F1ALU          SFP-SX
  PIC 3          REV 07   750-011800   JW1284           8x 1GE(LAN), IQ2
    Xcvr 0       REV 01   740-011613   P9F1AM6          SFP-SX
    Xcvr 6       REV 01   740-011613   P9F16NN          SFP-SX
    Xcvr 7       REV 01   740-011782   P8C29Y7          SFP-SX
  Board B        REV 02   710-011395   CN3754           M120 FPC Mezz
FPC 4            REV 02   710-011398   CP6741           M120 FPC Type 3
  PIC 0          REV 16   750-007141   NB2855           10x 1GE(LAN), 1000 BASE

    Xcvr 0       REV 01   740-011782   P922A1F          SFP-SX
    Xcvr 1       REV 01   740-011782   P922A16          SFP-SX
    Xcvr 2       REV 01   740-011782   P922A0U          SFP-SX
    Xcvr 3       REV 01   740-011782   P9229UZ          SFP-SX
    Xcvr 4       REV 01   740-009029   P11JXWP          SFP-LX
    Xcvr 6       REV 01   740-011613   P9F1ALW          SFP-SX
FPC 5            REV 01   710-011388   CJ9088           M120 FPC Type 1
  PIC 0          *** Hardware Not Supported ***
  PIC 1          REV 05   750-012052   NB0410           1x CHOC3 IQ SONET, SMLR

  PIC 2          REV 01   750-013167   CM3824           4x CHDS3 IQ
  PIC 3          REV 01   750-010240   CB5366           1x G/E SFP, 1000 BASE
  Board B        REV 01   710-011390   CJ9103           M120 FPC Mezz Board
FEB 3            REV 04   710-011663   CP6673           M120 FEB
FEB 4            REV 04   710-011663   CJ9368           M120 FEB
FEB 5            REV 04   710-011663   CJ9386           M120 FEB
Fan Tray 0                                              Front Top Fan Tray
Fan Tray 1                                              Front Bottom Fan Tray
Fan Tray 2                                              Rear Top Fan Tray
Fan Tray 3                                              Rear Bottom Fan Tray
```

show chassis hardware detail (M120 Router)

```
user@host> show chassis hardware detail
Hardware inventory:
Item             Version  Part number  Serial number    Description
Chassis                                JN000054AC       M120
Midplane         REV 01   710-013667   RB4170           M120 Midplane
FPM Board        REV 02   710-011407   CJ9186           M120 FPM Board
FPM Display      REV 02   710-011405   CJ9173           M120 FPM Display
FPM CIP          REV 02   710-011410   CJ9221           M120 FPM CIP
PEM 0            Rev 05   740-011936   RM28320          AC Power Entry Module
PEM 1            Rev 05   740-011936   RM28321          AC Power Entry Module
Routing Engine 0 REV 03   740-014080   1000642883       RE-A-1000
  ad0      248 MB  SILICONSYSTEMS INC 256M 126CT505S0763SC00110 Compact Flash
  ad2    38154 MB  HTE541040G9SA00     MPBBT0X2HS2E3M   Hard Disk
CB 0             REV 03   710-011403   CM8346           M120 Control Board
CB 1             REV 06   710-011403   CP6728           M120 Control Board
FPC 1            REV 02   710-015908   CP6925           M120 CFPC 10GE
  PIC 0                   BUILTIN      BUILTIN          1x 10GE(LAN/WAN) XFP
    Xcvr 0       REV 01   740-014279   62E204N00007     XFP-10G-LR
FPC 3            REV 03   710-011393   CJ9234           M120 FPC Type 2
  PIC 0          REV 16   750-008155   NB5229           2x G/E IQ, 1000 BASE
    Xcvr 0       REV 01   740-011613   P9F15JB          SFP-SX
```

```
    Xcvr 1          REV 01   740-007326   P4Q0R9G          SFP-SX
  PIC 1             REV 09   750-007745   CG4360           4x OC-3 SONET, SMIR
  PIC 2             REV 16   750-008155   ND7787           2x G/E IQ, 1000 BASE
    Xcvr 0          REV 01   740-011613   P9F12AS          SFP-SX
    Xcvr 1          REV 01   740-011613   P9F1ALU          SFP-SX
  PIC 3             REV 07   750-011800   JW1284           8x 1GE(LAN), IQ2
    Xcvr 0          REV 01   740-011613   P9F1AM6          SFP-SX
    Xcvr 6          REV 01   740-011613   P9F16NN          SFP-SX
    Xcvr 7          REV 01   740-011782   P8C29Y7          SFP-SX
  Board B           REV 02   710-011395   CN3754           M120 FPC Mezz
FPC 4               REV 02   710-011398   CP6741           M120 FPC Type 3
  PIC 0             REV 16   750-007141   NB2855           10x 1GE(LAN), 1000 BASE

    Xcvr 0          REV 01   740-011782   P922A1F          SFP-SX
    Xcvr 1          REV 01   740-011782   P922A16          SFP-SX
    Xcvr 2          REV 01   740-011782   P922A0U          SFP-SX
    Xcvr 3          REV 01   740-011782   P9229UZ          SFP-SX
    Xcvr 4          REV 01   740-009029   P11JXWP          SFP-LX
    Xcvr 6          REV 01   740-011613   P9F1ALW          SFP-SX
FPC 5               REV 01   710-011388   CJ9088           M120 FPC Type 1
  PIC 0             *** Hardware Not Supported ***
  PIC 1             REV 05   750-012052   NB0410           1x CHOC3 IQ SONET, SMLR

  PIC 2             REV 01   750-013167   CM3824           4x CHDS3 IQ
  PIC 3             REV 01   750-010240   CB5366           1x G/E SFP, 1000 BASE
  Board B           REV 01   710-011390   CJ9103           M120 FPC Mezz Board
FEB 3               REV 04   710-011663   CP6673           M120 FEB
FEB 4               REV 04   710-011663   CJ9368           M120 FEB
FEB 5               REV 04   710-011663   CJ9386           M120 FEB
Fan Tray 0                                                 Front Top Fan Tray
Fan Tray 1                                                 Front Bottom Fan Tray
Fan Tray 2                                                 Rear Top Fan Tray
Fan Tray 3                                                 Rear Bottom Fan Tray
```

show chassis hardware models (M120 Router)

```
user@host> show chassis hardware models
Hardware inventory:
Item                Version  Part number  CLEI code        FRU model number
Midplane            REV 01   710-013667                    
FPM CIP             REV 02   710-011410                    CRAFT-M120-S
PEM 0               Rev 05   740-011936                    PWR-M120-AC-S
PEM 1               Rev 05   740-011936                    PWR-M120-AC-S
Routing Engine 0 REV 03      740-014080                    RE-A-1000-2048-S
CB 0                REV 03   710-011403                    CB-M120-S
CB 1                REV 06   710-011403                    CB-M120-S
FPC 1               REV 02   710-015908                    M120-cFPC-1XGE-XFP
FPC 3
  PIC 0             REV 16   750-008155                    PB-2GE-SFP-QPP
  PIC 1             REV 09   750-007745                    PC-4OC3-SON-SMIR
  PIC 2             REV 16   750-008155                    PB-2GE-SFP-QPP
  PIC 3             REV 07   750-011800                    PB-8GE-TYPE2-SFP-IQ2
FPC 4
  PIC 0             REV 16   750-007141                    PC-10GE-SFP
FPC 5
  PIC 1             REV 05   750-012052                    PB-1CHOC3-SMIR-QPP
  PIC 2             REV 01   750-013167                    PE-4CHDS3-QPP
  PIC 3             REV 01   750-010240                    PB-1GE-SFP
Fan Tray 0                                                 FFANTRAY-M120-S
Fan Tray 1                                                 FFANTRAY-M120-S
Fan Tray 2                                                 RFANTRAY-M120-S
Fan Tray 3                                                 RFANTRAY-M120-S
```


show chassis hardware (M160 Router)

```
user@host> 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-1OC12-SON-SMIR
  PIC 2           REV 04   750-001894                     PB-1GE-SX
  PIC 3           REV 04   750-001896                     PB-1OC12-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-1OC12-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-4OC12-SON-SMIR
  PIC 1         REV 06   750-001900                     PB-1OC48-SON-SMSR
  PIC 2         REV 07   750-001900                     PB-1OC48-SON-SMSR
  PIC 3         REV 05   750-003737                     PB-4GE-SX
SIB 0           REV 03   710-009184                     SIB-M-S
SIB 1           REV 03   710-009184                     SIB-M-S
SIB 2           REV 03   710-009184                     SIB-M-S
SIB 3           REV 03   710-009184                     SIB-M-S
Fan Tray 0                                              FFANTRAY-M320-S
Fan Tray 1                                              FFANTRAY-M320-S
Fan Tray 2                                              RFANTRAY-M320-S
```

show chassis hardware detail (M160 Router)

```
user@host> show chassis hardware detail
Hardware inventory:
Item             Version  Part number  Serial number    Description
Chassis                                101              M160
Midplane         REV 02   710-001245   S/N AB4107
FPM CMB          REV 01   710-001642   S/N AA2911
FPM Display      REV 01   710-001647   S/N AA2999
CIP              REV 02   710-001593   S/N AA9563
PEM 0            Rev 01   740-001243   S/N KJ35769      DC
PEM 1            Rev 01   740-001243   S/N KJ35765      DC
PCG 0            REV 01   710-001568   S/N AA9794
PCG 1            REV 01   710-001568   S/N AA9804
Host 1                                 da000004f8d57001 teknor
MCS 1            REV 03   710-001226   S/N AA9777
SFM 0 SPP        REV 04   710-001228   S/N AA2975
SFM 0 SPR        REV 02   710-001224   S/N AA9838       Internet Processor I
  SSRAM bank 0   REV 01   710-000077   S/N 306456       1 MB
  SSRAM bank 1   REV 01   710-000077   S/N 306474       1 MB
  SSRAM bank 2   REV 01   710-000077   S/N 306388       1 MB
  SSRAM bank 3   REV 01   710-000077   S/N 306392       1 MB
SFM 1 SPP        REV 04   710-001228   S/N AA2860
SFM 1 SPR        REV 01   710-001224   S/N AB0139       Internet Processor I
  SSRAM bank 0   REV 01   710-000077   S/N 302917       1 MB
  SSRAM bank 1   REV 01   710-000077   S/N 302662       1 MB
  SSRAM bank 2   REV 01   710-000077   S/N 302593       1 MB
  SSRAM bank 3   REV 01   710-000077   S/N 100160       1 MB
FPC 0            REV 03   710-001255   S/N AA9806       FPC Type 1
  CPU            REV 02   710-001217   S/N AA9590
  SSRAM          REV 01   710-000077   S/N 302836       1 MB
  SDRAM 0        REV 01   710-001196   S00141           32 MB
  SDRAM 1        REV 01   710-001196   S0010;           32 MB
  SSRAM          REV 01   710-000077   S/N 302633       1 MB
  SDRAM 0        REV 01   710-001196   S00143           32 MB
  SDRAM 1        REV 01   710-001196   S00115           32 MB
  SSRAM          REV 01   710-000077   S/N 302952       1 MB
  SDRAM 0        REV 01   710-001196   S00135           32 MB
  SDRAM 1        REV 01   710-001196   S001=3           32 MB
  SSRAM          REV 01   710-000077   S/N 302892       1 MB
  SDRAM 0        REV 01   710-001196   S000?6           32 MB
  SDRAM 1        REV 01   710-001196   S001=5           32 MB
```



```
  PIC 1          REV 05   750-000616   S/N AA1527       1x OC-12 ATM, MM
  PIC 2          REV 05   750-000616   S/N AA1535       1x OC-12 ATM, MM
  PIC 3          REV 01   750-000616   S/N AA1519       1x OC-12 ATM, MM
FPC 1            REV 02   710-001611   S/N AA9523       FPC Type 2
  CPU            REV 02   710-001217   S/N AA9571
  SSRAM          REV 01   710-000077   S/N 306340       1 MB
  SDRAM 0        REV 01   710-001196   S00012           32 MB
  SDRAM 1        REV 01   710-001196   S0001?           32 MB
  SSRAM          REV 01   710-000077   S/N 306454       1 MB
  SDRAM 0        REV 01   710-001196   S00028           32 MB
  SDRAM 1        REV 01   710-001196   S0002?           32 MB
  SSRAM          REV 01   710-000077   S/N 306492       1 MB
  SDRAM 0        REV 01   710-001196   S00015           32 MB
  SDRAM 1        REV 01   710-001196   S00031           32 MB
  SSRAM          REV 01   710-000077   S/N 306363       1 MB
  SDRAM 0        REV 01   710-001196   S00013           32 MB
  SDRAM 1        REV 01   710-001196   S00032           32 MB
  PIC 0          REV 03   750-001900   S/N AA9626       1x STM-16 SDH, SMIR
  PIC 1          REV 01   710-002381   S/N AD3633       2x G/E, 1000 BASE-SX
FPC 2                                                   FPC Type OC192
... SSRAM          REV 01   710-000077   S/N 306466       1 MB
```

show chassis hardware (M320 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number    Description
Chassis                                67245            M320
Midplane         REV 05   710-009120   RB1202           M320 Midplane
FPM GBUS         REV 04   710-005928   HZ5697           M320 Board
FPM Display      REV 05   710-009351   HR1464           M320 FPM Display
CIP              REV 04   710-005926   HT8672           M320 CIP
PEM 0            Rev 05   740-009148   QK34208          DC Power Entry Module
PEM 1            Rev 05   740-009148   QK34262          DC Power Entry Module
PEM 2            Rev 05   740-009148   QF10449          DC Power Entry Module
PEM 3            Rev 05   740-009148   QJ18257          DC Power Entry Module
Routing Engine 0 REV 06   740-008883   P11123901185     RE-4.0
CB 0             REV 07   710-009115   JB2382           M320 Control Board
FPC 0            REV 02   710-005017   CD9926           M320 FPC Type 2
  CPU            REV 01   710-011659   CJ6940           M320 PCA SCPU
  PIC 0          REV 07   750-001900   AT1594           1x OC-48 SONET, SMSR
  PIC 1          REV 03   750-001850   HS2746           1x Tunnel
  PIC 2          REV 05   750-010618   JE7117           4x G/E SFP, 1000 BASE
  PIC 3          REV 06   750-001900   HE6083           1x OC-48 SONET, SMSR
FPC 2            REV 02   710-005017   CH0319           M320 FPC Type 1
  CPU            REV 01   710-011659   CJ6942           M320 PCA SCPU
  PIC 0          REV 05   750-003034   BD8705           4x OC-3 SONET, SMIR
FPC 5            REV 02   710-005017   CD9938           M320 FPC Type 2
  CPU
FPC 7            REV 02   710-005017   CD9934           M320 FPC Type 2
  CPU
SIB 0            REV 09   710-009184   JA6540           M320 SIB
SIB 1            REV 09   710-009184   HV9511           M320 SIB
SIB 2            REV 09   710-009184   HW2057           M320 SIB
SIB 3            REV 09   710-009184   JA6687           M320 SIB
Fan Tray 0                                              Front Top Fan Tray
Fan Tray 1                                              Front Bottom Fan Tray
Fan Tray 2                                              Rear Fan Tray
```

show chassis hardware models (M320 Router)

```
user@host> show chassis hardware models
Hardware inventory:
Item             Version  Part number  CLEI code        FRU model number
```

```
Midplane          REV 03   710-009120                         CHAS-BP-M320-S
FPM Display       REV 02   710-009351                         CRAFT-M320-S
CIP               REV 03   710-005926                         CIP-M320-S
PEM 2             Rev X4   740-009148                         PWR-M-DC-S
PEM 3             Rev X4   740-009148                         PWR-M-DC-S
Routing Engine 0  REV 02   740-008883                         RE-1600-2048-S
Routing Engine 1  REV 02   740-008883                         RE-1600-2048-S
FPC 0             REV 02   710-010419                         M320-FPC1
  PIC 0           REV 01   750-001323                         P-TUNNEL
  PIC 1           REV 02   750-002987                         PE-1OC12-SON-SMIR
  PIC 2           REV 04   750-001894                         PB-1GE-SX
  PIC 3           REV 04   750-001896                         PB-1OC12-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-1OC12-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-4OC12-SON-SMIR
  PIC 1           REV 06   750-001900                         PB-1OC48-SON-SMSR
  PIC 2           REV 07   750-001900                         PB-1OC48-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           Routing Engine
TFEB 0                     BUILTIN      BUILTIN           Forwarding Engine
Processor
  QXM 0           REV 05   711-028408   ZA9136            MPC QXM
FPC 0                      BUILTIN      BUILTIN           MPC BUILTIN
  MIC 0                    BUILTIN      BUILTIN           4x 10GE XFP
    PIC 0                  BUILTIN      BUILTIN           4x 10GE XFP
FPC 1                      BUILTIN      BUILTIN           MPC BUILTIN
  MIC 0           REV 24   750-028392   YX9820            3D 20x 1GE(LAN) SFP
    PIC 0                  BUILTIN      BUILTIN           10x 1GE(LAN) SFP
```



```
      Xcvr 0      REV 01   740-031851   AM1045SUAQ3        SFP-SX
      Xcvr 1      REV 01   740-031851   AM1045SUAPA        SFP-SX
      Xcvr 2      REV 01   740-031851   AM1045SUAN7        SFP-SX
      Xcvr 3      REV 01   740-031851   AM1045SU91Q        SFP-SX
      Xcvr 4      REV 01   740-031851   AM1045SUDDR        SFP-SX
      Xcvr 9      REV 01   740-011613   AM0848SB6A1        SFP-SX
    PIC 1                  BUILTIN      BUILTIN            10x 1GE(LAN) SFP
      Xcvr 0      REV 01   740-031851   AM1045SUAN0        SFP-SX
      Xcvr 1      REV 01   740-011613   AS0812S0719        SFP-SX
      Xcvr 2      REV 01   740-011613   AM0821SA121        SFP-SX
      Xcvr 3      REV 01   740-011613   PF21K21            SFP-SX
      Xcvr 4      REV 01   740-011613   AM0848SB69Z        SFP-SX
      Xcvr 5      REV 01   740-011782   P9P0XV3            SFP-SX
      Xcvr 6      REV 01   740-011613   AM0812S8WJN        SFP-SX
      Xcvr 7      REV 01   740-011613   PAM3G9Q            SFP-SX
      Xcvr 8      REV 01   740-011613   AM0848SB4A6        SFP-SX
      Xcvr 9      REV 01   740-011782   P9M0U37            SFP-SX
  MIC 1           REV 20   750-028380   ZG2657             3D 2x 10GE XFP
    PIC 2                  BUILTIN      BUILTIN            1x 10GE XFP
    PIC 3                  BUILTIN      BUILTIN            1x 10GE XFP
Fan Tray                                                   Fan Tray
```

show chassis hardware (MX10 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number      Description
Chassis                                E1372              MX10-T
Midplane         REV 01   711-038211   YF5285             MX10-T
PEM 0            Rev 04   740-028288   VB01678            AC Power Entry Module
Routing Engine            BUILTIN      BUILTIN            Routing Engine
TFEB 0                    BUILTIN      BUILTIN            Forwarding Engine
Processor
  QXM 0          REV 05   711-028408   ZA9053             MPC QXM
FPC 0                     BUILTIN      BUILTIN            MPC BUILTIN
  MIC 0                   BUILTIN      BUILTIN            4x 10GE XFP
    PIC 0                 BUILTIN      BUILTIN            4x 10GE XFP
FPC 1                     BUILTIN      BUILTIN            MPC BUILTIN
  MIC 0          REV 24   750-028392   YX9436             3D 20x 1GE(LAN) SFP
    PIC 0                 BUILTIN      BUILTIN            10x 1GE(LAN) SFP
      Xcvr 0     REV 01   740-031851   AM1107SUFQW        SFP-SX
    PIC 1                 BUILTIN      BUILTIN            10x 1GE(LAN) SFP
Fan Tray                                                  Fan Tray
```

show chassis hardware (MX40 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number      Description
Chassis                                E1367              MX40-T
Midplane         REV 01   711-038211   YF5284             MX40-T
PEM 0            Rev 04   740-028288   VB01680            AC Power Entry Module
PEM 1            Rev 04   740-028288   VB01700            AC Power Entry Module
Routing Engine            BUILTIN      BUILTIN            Routing Engine
TFEB 0                    BUILTIN      BUILTIN            Forwarding Engine
Processor
  QXM 0          REV 05   711-028408   ZA9048             MPC QXM
FPC 0                     BUILTIN      BUILTIN            MPC BUILTIN
  MIC 0                   BUILTIN      BUILTIN            4x 10GE XFP
    PIC 0                 BUILTIN      BUILTIN            4x 10GE XFP
      Xcvr 0     REV 01   740-014279   M7067UPP           XFP-10G-LR
      Xcvr 1              NON-JNPR     K9J02UN            XFP-10G-LR
FPC 1                     BUILTIN      BUILTIN            MPC BUILTIN
  MIC 0          REV 24   750-028392   YX3504             3D 20x 1GE(LAN) SFP
```

```
    PIC 0                BUILTIN      BUILTIN          10x 1GE(LAN) SFP
      Xcvr 0    REV 01   740-011613   AM0812S8WTE      SFP-SX
      Xcvr 1    REV 01   740-011613   PFA6KV2          SFP-SX
      Xcvr 2    REV 01   740-031851   AM1045SUDDM      SFP-SX
      Xcvr 3    REV 01   740-011613   PD63C7M          SFP-SX
      Xcvr 4    REV 01   740-011613   PD63DJY          SFP-SX
      Xcvr 5    REV 02   740-011613   AA0950STLL9      SFP-SX
      Xcvr 6    REV 01   740-011782   PAR1YHC          SFP-SX
      Xcvr 7    REV 01   740-011782   P9P0XXL          SFP-SX
      Xcvr 8    REV 01   740-011613   PD63D95          SFP-SX
      Xcvr 9    REV 01   740-031851   AM1045SU9B8      SFP-SX
    PIC 1                BUILTIN      BUILTIN          10x 1GE(LAN) SFP
      Xcvr 0    REV 01   740-011613   PF21L3Z          SFP-SX
      Xcvr 1    REV 01   740-031851   AM1045SU7M9      SFP-SX
      Xcvr 2    REV 01   740-031851   AM1045SUAPT      SFP-SX
      Xcvr 3    REV 01   740-011613   PFF2BZH          SFP-SX
      Xcvr 4    REV 01   740-031851   AM1045SUDDN      SFP-SX
      Xcvr 5    REV 01   740-031851   AM1039S00ZR      SFP-SX
      Xcvr 6    REV 01   740-031851   AM1045SUD6Y      SFP-SX
      Xcvr 8    REV 01   740-011613   PFM1QBS          SFP-SX
      Xcvr 9    REV 01   740-011613   PFF2E25          SFP-SX
  MIC 1         REV 01   750-021130   KG4391           3D 2x 10GE XFP
    PIC 2                BUILTIN      BUILTIN          1x 10GE XFP
      Xcvr 0    REV 01   740-011571   C645XJ04G        XFP-10G-SR
    PIC 3                BUILTIN      BUILTIN          1x 10GE XFP
      Xcvr 0             NON-JNPR     CA49BK0AE        XFP-10G-SR
Fan Tray                                               Fan Tray
```

show chassis hardware (Fixed MX80 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item            Version  Part number  Serial number    Description
Chassis                                                MX80-48T
Midplane        REV 01   711-031603   KF9250           MX80-48T
Routing Engine           BUILTIN      BUILTIN          Routing Engine
FEB 0                    BUILTIN      BUILTIN          Forwarding Engine Board
FPC 0                    BUILTIN      BUILTIN          MPC BUILTIN
  MIC 0                  BUILTIN      BUILTIN          4x 10GE XFP
    PIC 0                BUILTIN      BUILTIN          4x 10GE XFP
      Xcvr 0             NON-JNPR     M6439D41         XFP-10G-LR
      Xcvr 1    REV 01   740-014279   6XE931N00202     XFP-10G-LR
      Xcvr 2    REV 01   740-014289   C715XU05F        XFP-10G-SR
      Xcvr 3    REV 01   740-014289   C650XU0EP        XFP-10G-SR
FPC 1                    BUILTIN      BUILTIN          MPC BUILTIN
  MIC 0         REV 01   711-029399   JR6981           12x 1GE(LAN) RJ45
    PIC 0                BUILTIN      BUILTIN          12x 1GE(LAN) RJ45
    PIC 1                BUILTIN      BUILTIN          12x 1GE(LAN) RJ45
  MIC 1         REV 01   BUILTIN      BUILTIN          12x 1GE(LAN) RJ45
    PIC 2                BUILTIN      BUILTIN          12x 1GE(LAN) RJ45
    PIC 3                BUILTIN      BUILTIN          12x 1GE(LAN) RJ45
Fan Tray                                               Fan Tray
```

show chassis hardware (Modular MX80 Router)

```
user@host> show chassis hardware

Hardware inventory:
Item            Version  Part number  Serial number    Description
Chassis                                                MX80
Midplane        REV 02   711-031594   JR7084           MX80
PEM 0           Rev 01   740-028288   000018           AC Power Entry Module
Routing Engine           BUILTIN      BUILTIN          Routing Engine
FEB 0                    BUILTIN      BUILTIN          Forwarding Engine Board
```



```
  QXM 0          REV 05   711-028408   JR7041            MPC QXM
FPC 0                     BUILTIN      BUILTIN           MPC BUILTIN
  MIC 0                   BUILTIN      BUILTIN           4x 10GE XFP
    PIC 0                 BUILTIN      BUILTIN           4x 10GE XFP
FPC 1                     BUILTIN      BUILTIN           MPC BUILTIN
  MIC 0          REV 02   750-028380   JR6598            3D 2x 10GE XFP
    PIC 0                 BUILTIN      BUILTIN           1x 10GE XFP
      Xcvr 0     REV 01   740-014289   T07M86365         XFP-10G-SR
    PIC 1                 BUILTIN      BUILTIN           1x 10GE XFP
      Xcvr 0     REV 01   740-014289   T07M71094         XFP-10G-SR
  MIC 1          REV 02   750-028380   JG8548            3D 2x 10GE XFP
    PIC 2                 BUILTIN      BUILTIN           1x 10GE XFP
      Xcvr 0     REV 02   740-014289   T08L86302         XFP-10G-SR
    PIC 3                 BUILTIN      BUILTIN           1x 10GE XFP
      Xcvr 0     REV 02   740-014289   C810XU0BA         XFP-10G-SR
Fan Tray                                                 Fan Tray
```

show chassis hardware (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

user@host> **show chassis hardware detail**

```
Item             Version  Part number  Serial number    Description
Chassis                                JN11279B4AFC     MX240 Backplane
```

Displaying DIMM information)

```
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   AARCHOO            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 (MX960 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                                  MX960
Midplane         REV 01   710-013698   AA6082            MX960 Midplane
PIM              Rev 01   740-013110   000008            Power Inlet Module
PEM 2
PEM 3            Rev 01   740-013682   000038            PS 1.7kW; 200-240VAC in
Routing Engine 0 REV 00   740-015113   1000617944        RE-S-1300
CB 0             REV 05   710-013725   JK6947            MX960 Test SCB
```



```
FPC 4            REV 01   710-013305   JM7617           MX960 Test DPC
  CPU
  PIC 0                   BUILTIN      BUILTIN          1x 10GE(LAN/WAN)
  PIC 1                   BUILTIN      BUILTIN          10x 1GE
FPC 7            REV 01   710-013305   JL9634           MX960 Test DPC
  CPU
  PIC 0                   BUILTIN      BUILTIN          1x 10GE(LAN/WAN)
    Xcvr 0                NON-JNPR     MYBG65I82C       XFP-10G-SR
  PIC 1                   BUILTIN      BUILTIN          10x 1GE
    Xcvr 1       REV 01   740-011782   P7N0368          SFP-SX
    Xcvr 4       REV 01   740-011782   P8J1W27          SFP-SX
    Xcvr 6       REV 01   740-011782   P8J1VSD          SFP-SX
    Xcvr 9       REV 01   740-011782   P8J1W25          SFP-SX
Fan Tray 0
Fan Tray 1
```

show chassis hardware (MX960 Router with Bidirectional Optics)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number    Description
Chassis                                JN10BA5B9AFA     MX960
Midplane         REV 03   710-013698   TR0234           MX960 Backplane
FPM Board        REV 03   710-014974   JA0878           Front Panel Display
PDM             Rev 03   740-013110   QCS11135028      Power Distribution Module
PEM 0            Rev 03   740-013682   QCS11154036      PS 1.7kW; 200-240VAC in
PEM 1            Rev 03   740-013682   QCS11154010      PS 1.7kW; 200-240VAC in
PEM 2            Rev 03   740-013682   QCS11154022      PS 1.7kW; 200-240VAC in
Routing Engine 0 REV 06   740-013063   1000691458       RE-S-2000
CB 0             REV 07   710-013385   KA2190           MX SCB
CB 1             REV 07   710-013385   KA0837           MX SCB
FPC 3            REV 02   750-018122   KB3890           DPCE 40x 1GE R
  CPU
FPC 4            REV 01   750-018122   KB3889           DPCE 40x 1GE R
  CPU            REV 06   710-013713   KB3976           DPC PMB
  PIC 0                   BUILTIN      BUILTIN          10x 1GE(LAN)
    Xcvr 1       REV 01   740-020426   4910549          SFP-1000BASE-BX40-D
    Xcvr 2       REV 01   740-020426   4910551          SFP-1000BASE-BX40-D
    Xcvr 5       REV 01   740-021340   77E245N00006     SFP-1000BASE-BX10-U
    Xcvr 6       REV 01   740-020425   4882821          SFP-1000BASE-BX40-U
    Xcvr 8       REV 01   740-020425   4882820          SFP-1000BASE-BX40-U
  PIC 1                   BUILTIN      BUILTIN          10x 1GE(LAN)
    Xcvr 0       REV 01   740-020465   77E555N00894     SFP-1000BASE-BX10-D
    Xcvr 1       REV 01   740-020465   75E467X00818     SFP-1000BASE-BX10-D
    Xcvr 2       REV 01   740-020465   75E467X00573     SFP-1000BASE-BX10-D
    Xcvr 3       REV 01   740-020465   4888227          SFP-1000BASE-BX10-D
    Xcvr 4       REV 01   740-020465   4888241          SFP-1000BASE-BX10-D
    Xcvr 5       REV 01   740-021340   77E245N00005     SFP-1000BASE-BX10-U
    Xcvr 6       REV 01   740-021340   76E245X00487     SFP-1000BASE-BX10-U
    Xcvr 7       REV 01   740-021341   5255889          SFP-1000BASE-BX10-U
    Xcvr 8       REV 01   740-021341   5255887          SFP-1000BASE-BX10-U
    Xcvr 9       REV 01   740-021340   77E245N00004     SFP-1000BASE-BX10-U
  PIC 2                   BUILTIN      BUILTIN          10x 1GE(LAN)
    Xcvr 0       REV 01   740-020424   5007582          SFP-1000BASE-BX10-D
    Xcvr 1       REV 01   740-020424   4888187          SFP-1000BASE-BX10-D
    Xcvr 2       REV 01   740-020424   4656500          SFP-1000BASE-BX10-D
    Xcvr 5       REV 01   740-021341   5255886          SFP-1000BASE-BX10-U
    Xcvr 7       REV 01   740-021340   77E245N00003     SFP-1000BASE-BX10-U
    Xcvr 8       REV 01   740-021341   5255888          SFP-1000BASE-BX10-U
  PIC 3                   BUILTIN      BUILTIN          10x 1GE(LAN)
    Xcvr 0       REV 01   740-017726   74S184H30341     SFP-EX
    Xcvr 1       REV 01   740-017726   4814061          SFP-EX
    Xcvr 5       REV 01   740-017726   6ZS184H31108     SFP-EX
```



```
    Xcvr 9        REV 01   740-021340   76E245X00486     SFP-1000BASE-BX10-U
Fan Tray 0
Fan Tray 1        REV 03   740-014971   TP0850           Fan Tray
```

show chassis hardware (MX960 Router with Enhanced MX SCB)

```
user@host> 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   PDS0MRY          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   AHN0X1Z          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   PDS0MPZ          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

```
user@host> show chassis hardware models
Hardware inventory:
Item             Version   Part number  Serial number    FRU model number
```

Router with Enhanced MX SCB)

```
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-4OC48-SON-SFP
  PIC 1           REV 32   750-003700   DP2113           PC-1OC192-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-4OC3-1OC12-SON2-SFP
  PIC 1           REV 08   750-014637   DM3671           PB-4OC3-4OC12-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
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show chassis hardware detail (MX960 Router)

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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    NR0WT5925N77     Hard Disk
CB 0              REV 05   710-013725   JK6947           MX960 Test SCB
FPC 4             REV 01   710-013305   JM7617           MX960 Test DPC
  CPU
  PIC 0                    BUILTIN      BUILTIN          1x 10GE(LAN/WAN)
  PIC 1                    BUILTIN      BUILTIN          10x 1GE
FPC 7             REV 01   710-013305   JL9634           MX960 Test DPC
  CPU
  PIC 0                    BUILTIN      BUILTIN          1x 10GE(LAN/WAN)
    Xcvr 0                 NON-JNPR     MYBG65I82C       XFP-10G-SR
  PIC 1                    BUILTIN      BUILTIN          10x 1GE
    Xcvr 1        REV 01   740-011782   P7N0368          SFP-SX
    Xcvr 4        REV 01   740-011782   P8J1W27          SFP-SX
    Xcvr 6        REV 01   740-011782   P8J1VSD          SFP-SX
    Xcvr 9        REV 01   740-011782   P8J1W25          SFP-SX
Fan Tray 0
Fan Tray 1
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show chassis hardware (MX2010 Router)

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Hardware inventory:
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
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PMP              REV 03   711-032426   ACAJ1388         Power Midplane
FPM Board        REV 06   711-032349   ZX8744           Front Panel Display
PSM 4            REV 0C   740-033727   VK00254          DC 52V Power Supply
Module
PSM 5            REV 0B   740-033727   VG00015          DC 52V Power Supply
Module
PSM 6            REV 0B   740-033727   VH00097          DC 52V Power Supply
Module
PSM 7            REV 0C   740-033727   VJ00151          DC 52V Power Supply
Module
PSM 8            REV 0C   740-033727   VJ00149          DC 52V Power Supply
Module
PDM 0            REV 0B   740-038109   WA00008          DC Power Dist Module
PDM 1            REV 0B   740-038109   WA00014          DC Power Dist Module
Routing Engine 0 REV 02   740-041821   9009094134       RE-S-1800x4
Routing Engine 1 REV 02   740-041821   9009094141       RE-S-1800x4
CB 0             REV 08   750-040257   CAAB3491         Control Board
CB 1             REV 08   750-040257   CAAB3489         Control Board
SPMB 0           REV 02   711-041855   CAAA6135         PMB Board
SPMB 1           REV 02   711-041855   CAAA6137         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           MPCE Type 3D
  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
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      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   AJC0JML           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
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    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
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show chassis hardware detail (MX2010 Router)

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Hardware inventory:
Item               Version   Part number   Serial number    Description
Chassis                                    JN11E233DAFK     MX2010
Midplane           REV 26    750-044636    ABAB9357         Lower Backplane
Midplane 1         REV 01    711-044557    ABAB8643         Upper Backplane
PMP                REV 04    711-032426    ACAJ1677         Power Midplane
FPM Board          REV 08    760-044634    ABBV9726         Front Panel Display
PSM 0              REV 01    740-045050    1E02224000P      DC 52V Power Supply
Module
PSM 1              REV 01    740-045050    1E02224000M      DC 52V Power Supply
Module
PSM 2              REV 01    740-045050    1E022240010      DC 52V Power Supply
Module
PSM 3              REV 01    740-045050    1E02224000G      DC 52V Power Supply
Module
PSM 4              REV 01    740-045050    1E022240013      DC 52V Power Supply
Module
PSM 5              REV 01    740-045050    1E022240007      DC 52V Power Supply
Module
PSM 6              REV 01    740-045050    1E02224001C      DC 52V Power Supply
Module
PSM 7              REV 01    740-045050    1E02224001D      DC 52V Power Supply
Module
PSM 8              REV 01    740-045050    1E02224001B      DC 52V Power Supply
Module
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
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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           MPCE Type 3D
  CPU            REV 06   711-035209   ZG5431           HMPC PMB 2G
  MIC 0          REV 15   750-033199   ZP6435           1X100GE CFP
    PIC 0                 BUILTIN      BUILTIN          1X100GE CFP
      Xcvr 0     REV 01   740-032210   J11E46118        CFP-100G-LR4
  MIC 1          REV 15   750-033199   ZP6442           1X100GE CFP
    PIC 2                 BUILTIN      BUILTIN          1X100GE CFP
      Xcvr 0     REV 01   740-032210   UMN03T4          CFP-100G-LR4
FPC 2            REV 16   750-037358   CAAL1001         MPC Type 4-1
  CPU            REV 08   711-035209   CAAK7927         HMPC PMB 2G
  PIC 0                   BUILTIN      BUILTIN          8X10GE SFPP
    Xcvr 0       REV 01   740-031980   193363A00589     SFP+-10G-SR
    Xcvr 1       REV 01   740-021308   973152A00028     SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   193363A00376     SFP+-10G-SR
    Xcvr 3       REV 01   740-021308   973152A00016     SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   193363A00499     SFP+-10G-SR
    Xcvr 5       REV 01   740-021308   973152A00039     SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   B11E01239        SFP+-10G-SR
    Xcvr 7       REV 01   740-021308   973152A00058     SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN          8X10GE SFPP
    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 SFPP
    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 SFPP
    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
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    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            MPCE Type 3D
  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
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      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   AJ40JKK           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
```



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    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          MPCE Type 3D
  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)

```
user@host > show chassis hardware extensive
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11E233DAFK      MX2010
 Jedec Code:    0x7fb0           EEPROM Version:    0x02
                                 S/N:               JN11E233DAFK
 Assembly ID:   0x0557           Assembly Version:  00.00
 Date:          00-00-0000       Assembly Flags:    0x00
 ID: MX2010
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
```

```
  Address 0x00: 7f b0 02 ff 05 57 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x20: 4a 4e 31 31 45 32 33 33 44 41 46 4b 00 00 00 00
  Address 0x30: 00 00 00 ff 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane         REV 26   750-044636   ABAB9357          Lower Backplane
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          750-044636       S/N:               S/N ABAB9357
 Assembly ID:  0x0b66           Assembly Version:  01.26
 Date:         08-28-2012       Assembly Flags:    0x00
 Version:      REV 26           CLEI Code:         PROTOXCLEI
 ID: Lower Backplane            FRU Model Number:  PROTO-ASSEMBLY
 Board Information Record:
  Address 0x00: ad 01 08 00 2c 21 72 70 a0 00 ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 66 01 1a 52 45 56 20 32 36 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 34 34 36 33 36 00 00
  Address 0x20: 53 2f 4e 20 41 42 41 42 39 33 35 37 00 1c 08 07
  Address 0x30: dc ff ff ff ad 01 08 00 2c 21 72 70 a0 00 ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 50
  Address 0x50: 52 4f 54 4f 2d 41 53 53 45 4d 42 4c 59 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 30 30 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff c2 ff 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:               S/N ABAB8643
 Assembly ID:  0x0b65           Assembly Version:  01.01
 Date:         07-27-2012       Assembly Flags:    0x00
 Version:      REV 01
 ID: Upper Backplane
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 0b 65 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 34 34 35 35 37 00 00
  Address 0x20: 53 2f 4e 20 41 42 41 42 38 36 34 33 00 1b 07 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
  Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
PMP              REV 04   711-032426   ACAJ1677          Power Midplane
Jedec Code:   0x7fb0           EEPROM Version:    0x01
 P/N:          711-032426       S/N:               S/N ACAJ1677
 Assembly ID:  0x045d           Assembly Version:  01.04
 Date:         07-20-2012       Assembly Flags:    0x00
 Version:      REV 04
 ID: Power Midplane
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 04 5d 01 04 52 45 56 20 30 34 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 33 32 34 32 36 00 00
  Address 0x20: 53 2f 4e 20 41 43 41 4a 31 36 37 37 00 14 07 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 00 ff ff ff ff ff ff ff ff ff ff ff
  Address 0x50: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x60: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
```



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  Address 0x70: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM Board        REV 08   760-044634   ABBV9726         Front Panel Display
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          760-044634       S/N:               S/N ABBV9726
 Assembly ID:  0x0b64           Assembly Version:  01.08
 Date:         09-10-2012       Assembly Flags:    0x00
 Version:      REV 08           CLEI Code:         IPMYA4EJRA
 ID: Front Panel Display        FRU Model Number:  MX2010-CRAFT-S
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 64 01 08 52 45 56 20 30 38 00 00
  Address 0x10: 00 00 00 00 37 36 30 2d 30 34 34 36 33 34 00 00
  Address 0x20: 53 2f 4e 20 41 42 42 56 39 37 32 36 00 0a 09 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 4d 59 41 34 45 4a 52 41 4d
  Address 0x50: 58 32 30 31 30 2d 43 52 41 46 54 2d 53 00 00 00
  Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 93 ff ff ff ff ff ff ff ff ff ff ff ff
PSM 0            REV 01   740-045050   1E02224000P      DC 52V Power Supply
Module
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          740-045050       S/N:               1E02224000P
 Assembly ID:  0x0478           Assembly Version:  01.01
 Date:         12-06-2012       Assembly Flags:    0x00
 Version:      REV 01           CLEI Code:         XXXXXXXXXX
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-HC-DC-S-A
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 30 35 30 00 00
  Address 0x20: 31 45 30 32 32 32 34 30 30 30 50 00 00 06 0c 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 58 58 58 58 58 58 58 58 58 58 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 48 43 2d 44 43 2d
  Address 0x60: 53 2d 41 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 4a 00 00 00 00 00 00 00 00 00 00 00 00
PSM 1            REV 01   740-045050   1E02224000M      DC 52V Power Supply
Module
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          740-045050       S/N:               1E02224000M
Assembly ID:  0x0478           Assembly Version:  01.01
 Date:         12-06-2012       Assembly Flags:    0x00
 Version:      REV 01           CLEI Code:         XXXXXXXXXX
 ID: DC 52V Power Supply Module  FRU Model Number:  MX2000-PSM-HC-DC-S-A
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 78 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 30 35 30 00 00
  Address 0x20: 31 45 30 32 32 32 34 30 30 30 4d 00 00 06 0c 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 58 58 58 58 58 58 58 58 58 58 4d
  Address 0x50: 58 32 30 30 30 2d 50 53 4d 2d 48 43 2d 44 43 2d
  Address 0x60: 53 2d 41 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 4a 00 00 00 00 00 00 00 00 00 00 00 00
...
PDM 0            REV 01   740-045234   1E262250067      DC Power Dist Module
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          740-045234       S/N:               1E262250067
```

```
 Assembly ID:  0x047b          Assembly Version:  01.01
 Date:         06-28-2012      Assembly Flags:    0x00
 Version:      REV 01          CLEI Code:         IPUPAJSKAA
 ID: DC Power Dist Module      FRU Model Number:  MX2000-PDM-DC-S-A
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 7b 01 01 52 45 56 20 30 31 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 35 32 33 34 00 00
  Address 0x20: 31 45 32 36 32 32 35 30 30 36 37 00 00 1c 06 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 49 50 55 50 41 4a 53 4b 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 50 44 4d 2d 44 43 2d 53 2d 41
  Address 0x60: 00 00 00 00 00 00 31 30 31 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 89 00 00 00 00 00 00 00 00 00 00 00 00
Routing Engine 0 REV 02   740-041821   9009099704        RE-S-1800x4
 Jedec Code:   0x7fb0          EEPROM Version:    0x02
 P/N:          740-041821      S/N:               9009099704
 Assembly ID:  0x09c0          Assembly Version:  01.02
 Date:         03-15-2012      Assembly Flags:    0x00
 Version:      REV 02
 ID: RE-S-1800x4               FRU Model Number:  RE-S-1800X4-16G-S
 Board Information Record:
  Address 0x00: 54 32 30 32 37 44 41 2d 34 34 47 42 23 41 23 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 09 c0 01 02 52 45 56 20 30 32 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 34 31 38 32 31 00 00
  Address 0x20: 39 30 30 39 30 39 39 37 30 34 00 00 00 0f 03 07
  Address 0x30: dc ff ff ff 54 32 30 32 37 44 41 2d 34 34 47 42
  Address 0x40: 23 41 23 00 01 00 00 00 00 00 00 00 00 00 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:               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 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:               S/N ABBV3825
 Assembly ID:  0x0b29           Assembly Version:  01.02
 Date:         08-14-2012       Assembly Flags:    0x00
 Version:      REV 02
 ID: PMB Board
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 0b 29 01 02 52 45 56 20 30 32 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 34 31 38 35 35 00 00
  Address 0x20: 53 2f 4e 20 41 42 42 56 33 38 32 35 00 0e 08 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff 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
...
SFB 0            REV 05   711-044466   ABBX5682         Switch Fabric Board
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          711-044466       S/N:               S/N ABBX5682
 Assembly ID:  0x0b25           Assembly Version:  01.05
 Date:         09-07-2012       Assembly Flags:    0x00
 Version:      REV 05           CLEI Code:         PROTOXCLEI
 ID: Switch Fabric Board        FRU Model Number:  PROTO-ASSEMBLY
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 25 01 05 52 45 56 20 30 35 00 00
  Address 0x10: 00 00 00 00 37 31 31 2d 30 34 34 34 36 36 00 00
  Address 0x20: 53 2f 4e 20 41 42 42 58 35 36 38 32 00 07 09 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff 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 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:               S/N CAAF0924
 Assembly ID:  0x0b4e           Assembly Version:  01.09
```

```
 Date:         05-21-2012        Assembly Flags:    0x00
 Version:      REV 09            CLEI Code:         PROTOXCLEI
 ID: MPC Type 4-2                FRU Model Number:  MPC4E-2CGE-8XGE
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 0b 4e 01 09 52 45 56 20 30 39 00 00
  Address 0x10: 00 00 00 00 37 35 30 2d 30 33 37 33 35 35 00 00
  Address 0x20: 53 2f 4e 20 43 41 41 46 30 39 32 34 00 15 05 07
  Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 4d
  Address 0x50: 50 43 34 45 2d 32 43 47 45 2d 38 58 47 45 00 00
  Address 0x60: 00 00 00 00 00 00 30 39 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff c6 ff ff ff ff ff ff ff ff ff ff ff ff
  CPU           REV 08   711-035209   CAAB9842          HMPC PMB 2G
 Jedec Code:   0x7fb0            EEPROM Version:    0x01
 P/N:          711-035209        S/N:               S/N CAAB9842
 Assembly ID:  0x0b04            Assembly Version:  01.08
 Date:         05-17-2012        Assembly Flags:    0x00
 Version:      REV 08
 ID: HMPC PMB 2G
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff 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 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           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:               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 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 ff
  Address 0x40: ff ff ff ff 01 49 50 55 43 42 41 38 43 41 41 4d
  Address 0x50: 58 32 30 30 30 2d 4c 43 2d 41 44 41 50 54 45 52
  Address 0x60: 00 00 00 00 00 00 41 00 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 3a 00 00 00 00 00 00 00 00 00 00 00 00
...
```

show chassis hardware models (MX2010 Router)

user@host > **show chassis hardware models**

```
Hardware inventory:
Item              Version   Part number   Serial number     FRU model number
FPM Board         REV 06    711-032349    ZX8744            711-032349
PSM 4             REV 0C    740-033727    VK00254           00000000000000000000000
PSM 5             REV 0B    740-033727    VG00015           00000000000000000000000
PSM 6             REV 0B    740-033727    VH00097           00000000000000000000000
PSM 7             REV 0C    740-033727    VJ00151           00000000000000000000000
PSM 8             REV 0C    740-033727    VJ00149           00000000000000000000000
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        00000000000000000000000
PSM 5             REV 0B    740-033727    0000000000        00000000000000000000000
PSM 6             REV 0B    740-033727    0000000000        00000000000000000000000
```

```
PSM 7             REV 0C   740-033727   0000000000       0000000000000000000000
PSM 8             REV 0C   740-033727   0000000000       0000000000000000000000
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 (MX2020 Router)

```
user@host > show chassis hardware
Hardware inventory:
Item              Version  Part number  Serial number    Description
Chassis                                 JN11E2227AFJ     MX2020
Midplane          REV 27   750-040240   ABAB9384         Lower Power Midplane
Midplane 1        REV 04   711-032386   ABAB9386         Upper Backplane
PMP 1             REV 05   711-032428   ACAJ1579         Upper Power Midplane
PMP 0             REV 04   711-032426   ACAJ1524         Lower Power Midplane
FPM Board         REV 06   760-040242   ABBT8837         Front Panel Display
PSM 0             REV 01   740-045050   1E022240056      DC 52V Power Supply
Module
PSM 1             REV 01   740-045050   1E022240054      DC 52V Power Supply
Module
PSM 2             REV 01   740-045050   1E02224005H      DC 52V Power Supply
Module
PSM 3             REV 01   740-045050   1E022240053      DC 52V Power Supply
Module
PSM 4             REV 01   740-045050   1E02224004K      DC 52V Power Supply
Module
PSM 7             REV 01   740-045050   1E02224006W      DC 52V Power Supply
Module
PSM 8             REV 01   740-045050   1E022240062      DC 52V Power Supply
Module
PSM 9             REV 01   740-045050   1E02224005B      DC 52V Power Supply
Module
PSM 10            REV 01   740-045050   1E02224005A      DC 52V Power Supply
Module
PSM 11            REV 01   740-045050   1E022240052      DC 52V Power Supply
```



```
Module
PSM 12           REV 01   740-045050   1E022240051       DC 52V Power Supply
Module
PSM 13           REV 01   740-045050   1E022240058       DC 52V Power Supply
Module
PSM 14           REV 01   740-045050   1E02224004L       DC 52V Power Supply
Module
PSM 15           REV 01   740-045050   1E02224005M       DC 52V Power Supply
Module
PSM 16           REV 01   740-045050   1E02224006S       DC 52V Power Supply
Module
PSM 17           REV 01   740-045050   1E02224005Z       DC 52V Power Supply
Module
PDM 0            REV 01   740-045234   1E012150033       DC Power Dist Module
PDM 1            REV 01   740-045234   1E012150027       DC Power Dist Module
PDM 2            REV 01   740-045234   1E012150028       DC Power Dist Module
PDM 3            REV 01   740-045234   1E012150045       DC Power Dist Module
Routing Engine 0 REV 02   740-041821   9009089704        RE-S-1800x4
Routing Engine 1 REV 02   740-041821   9009094138        RE-S-1800x4
CB 0             REV 14   750-040257   CAAF8430          Control Board
CB 1             REV 08   750-040257   CAAB3482          Control Board
SPMB 0           REV 01   711-041855   ZS2290            PMB Board
SPMB 1           REV 02   711-041855   CAAA6141          PMB Board
SFB 0            REV 03   711-044466   ABBV6789          Switch Fabric Board
SFB 1            REV 05   711-044466   ABBX5666          Switch Fabric Board
SFB 2            REV 05   711-044466   ABBX5678          Switch Fabric Board
SFB 3            REV 05   711-044466   ABBX5687          Switch Fabric Board
SFB 4            REV 05   711-044466   ABBX5609          Switch Fabric Board
SFB 5            REV 05   711-044466   ABBX5675          Switch Fabric Board
SFB 6            REV 03   711-044466   ABBV6805          Switch Fabric Board
SFB 7            REV 05   711-044466   ABBX5701          Switch Fabric Board
FPC 0            REV 30   750-028467   ABBN0284          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBN0507          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E00990         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E04357         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11F01327         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E04375         SFP+-10G-USR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E02760         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E02904         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E03963         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E00756         SFP+-10G-USR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E04418         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E01077         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E01128         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11F01253         SFP+-10G-USR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E01140         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11F01626         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E01075         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E01177         SFP+-10G-USR
FPC 1            REV 30   750-028467   ABBN0208          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   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 2            REV 30   750-028467   ZM5111            MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ZP6607            AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80LJA           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80MFZ           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80NKL           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80KF4           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80FBJ           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80MM2           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80LJV           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80NXV           SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80N1H           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80NLS           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80FL5           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80NL9           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80NG2           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80KDU           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80MG1           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80MM0           SFP+-10G-SR
FPC 3            REV 30   750-028467   ABBN0302          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBN0495          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11F01581         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E01176         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11F01251         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E02752         SFP+-10G-USR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E00786         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E01020         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E01023         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E02819         SFP+-10G-USR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E02812         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11D04437         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11F01279         SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11F01333         SFP+-10G-USR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E00978         SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E01018         SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11F01784         SFP+-10G-USR
    Xcvr 3       REV 01   740-031980   AK80NKP           SFP+-10G-SR
FPC 4            REV 30   750-028467   ABBN0308          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBJ1095          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
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    Xcvr 0       REV 01   740-030658   B11E04305          SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E01147          SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E01195          SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11F01743          SFP+-10G-USR
  PIC 1                   BUILTIN      BUILTIN            4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11F01892          SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E02880          SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E00725          SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E01057          SFP+-10G-USR
  PIC 2                   BUILTIN      BUILTIN            4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11E02816          SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11C04501          SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E02764          SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E00789          SFP+-10G-USR
  PIC 3                   BUILTIN      BUILTIN            4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-030658   B11F01250          SFP+-10G-USR
    Xcvr 1       REV 01   740-030658   B11E02847          SFP+-10G-USR
    Xcvr 2       REV 01   740-030658   B11E00787          SFP+-10G-USR
    Xcvr 3       REV 01   740-030658   B11E03803          SFP+-10G-USR
FPC 5            REV 30   750-028467   ABBN0316           MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBJ1082           AMPC PMB
  PIC 0                   BUILTIN      BUILTIN            4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   B11K00523          SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11K01848          SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K01865          SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11K00540          SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN            4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   B11K00422          SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11K00428          SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K00423          SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11K01855          SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN            4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   B11K01847          SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11K00526          SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K00529          SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11K00525          SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN            4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   B11K00425          SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11K00530          SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K01851          SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11K00528          SFP+-10G-SR
FPC 6            REV 32   750-028467   ABBN6832           MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBK6534           AMPC PMB
  PIC 0                   BUILTIN      BUILTIN            4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80MB4            SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80FQ6            SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80N1F            SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80NLQ            SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN            4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80KDR            SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80FGJ            SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80N5G            SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80KD8            SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN            4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80LET            SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80N1X            SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80NRF            SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80NL2            SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN            4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80N3D            SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80MRB            SFP+-10G-SR
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    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
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    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
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    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   AJQ0Q5G           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
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    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
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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
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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
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show chassis hardware detail (MX2020 Router)

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user@host> show chassis hardware detail
Hardware inventory:
Item              Version  Part number  Serial number     Description
Chassis                                 JN11E2227AFJ      MX2020
Midplane          REV 27   750-040240   ABAB9384          Lower Power Midplane
Midplane 1        REV 04   711-032386   ABAB9386          Upper Backplane
PMP 1             REV 05   711-032428   ACAJ1821          Upper Power Midplane
PMP 0             REV 04   711-032426   ACAJ1524          Lower Power Midplane
FPM Board         REV 06   760-040242   ABBT8837          Front Panel Display
PSM 0             REV 01   740-045050   1E02224006G       DC 52V Power Supply
Module
PSM 1             REV 01   740-045050   1E022240053       DC 52V Power Supply
Module
PSM 2             REV 01   740-045050   1E02224004K       DC 52V Power Supply
Module
PSM 3             REV 01   740-045050   1E022240056       DC 52V Power Supply
Module
PSM 4             REV 01   740-045050   1E022240054       DC 52V Power Supply
Module
PSM 5             REV 01   740-045050   1E02224005H       DC 52V Power Supply
Module
PSM 6             REV 01   740-045050   1E02224006S       DC 52V Power Supply
Module
PSM 7             REV 01   740-045050   1E02224005M       DC 52V Power Supply
Module
PSM 8             REV 01   740-045050   1E022240062       DC 52V Power Supply
Module
PSM 9             REV 03   740-045050   1EDB2350095       DC 52V Power Supply
Module
PSM 10            REV 03   740-045050   1EDB235009L       DC 52V Power Supply
Module
PSM 11            REV 03   740-045050   1EDB2350092       DC 52V Power Supply
Module
PSM 12            REV 03   740-045050   1EDB23500AT       DC 52V Power Supply
Module
PSM 13            REV 03   740-045050   1EDB2350094       DC 52V Power Supply
Module
PSM 15            REV 03   740-045050   1EDB235008X       DC 52V Power Supply
Module
PDM 0             REV 01   740-045234   1E012150033       DC Power Dist Module
PDM 1             REV 01   740-045234   1E012150027       DC Power Dist Module
PDM 2             REV 01   740-045234   1E262250072       DC Power Dist Module
Routing Engine 0 REV 02    740-041821   9009094138        RE-S-1800x4
  ad0     3998 MB  Virtium - TuffDisk VCF3 20110825A021D0000064 Compact Flash
  ad1    30533 MB  UGB94ARF32H0S3-KC    UNIGEN-499551-000347 Disk 1
  usb0 (addr 1)  EHCI root hub 0        Intel             uhub0
  usb0 (addr 2)  product 0x0020 32      vendor 0x8087     uhub1
  DIMM 0         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 1         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 2         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
  DIMM 3         SGU04G72H1BD2SA-BB DIE REV-52 PCB REV-54 MFR ID-ce80
Routing Engine 1 REV 02    740-041821   9009089709        RE-S-1800x4
  ad0     3831 MB  UGB30SFA4000T1       SFA4000T1 00000113 Compact Flash
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  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   CAAA6141         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   ABBJ1082         AMPC PMB
  PIC 0                   BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   B11K00523        SFP+-10G-SR
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    Xcvr 1       REV 01   740-031980   B11K01848         SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K01865         SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11K00540         SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   B11K00422         SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11K00428         SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K00423         SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11K01855         SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   B11K01847         SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11K00526         SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K00529         SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11K00525         SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
Xcvr 0       REV 01   740-031980   B11K00425         SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11K00530         SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11K01851         SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11K00528         SFP+-10G-SR
FPC 3            REV 32   750-028467   ABBN6832          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBK6534          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80MB4           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80FQ6           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80N1F           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80NLQ           SFP+-10G-SR
  PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80KDR           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80FGJ           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80N5G           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80KD8           SFP+-10G-SR
  PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80LET           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80N1X           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80NRF           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80NL2           SFP+-10G-SR
  PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80N3D           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AK80MRB           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80LEQ           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AK80LER           SFP+-10G-SR
FPC 4            REV 32   750-028467   ABBN6811          MPC 3D 16x 10GE
  CPU            REV 10   711-029089   ABBN7288          AMPC PMB
  PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80NK8           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   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
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    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
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      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
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    Xcvr 3        REV 01   740-030658   B11E02819        SFP+-10G-USR
  PIC 2                    BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0        REV 01   740-030658   B11E02812        SFP+-10G-USR
    Xcvr 1        REV 01   740-030658   B11D04437        SFP+-10G-USR
    Xcvr 2        REV 01   740-030658   B11F01279        SFP+-10G-USR
    Xcvr 3        REV 01   740-030658   B11F01333        SFP+-10G-USR
  PIC 3                    BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0        REV 01   740-030658   B11E00978        SFP+-10G-USR
    Xcvr 1        REV 01   740-030658   B11E01018        SFP+-10G-USR
    Xcvr 2        REV 01   740-030658   B11F01784        SFP+-10G-USR
    Xcvr 3        REV 01   740-031980   AK80NKP          SFP+-10G-SR
FPC 11            REV 32   750-028467   ABBN6790         MPC 3D 16x 10GE
  CPU             REV 10   711-029089   ABBK6515         AMPC PMB
  PIC 0                    BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0        REV 01   740-031980   AK80LZM          SFP+-10G-SR
    Xcvr 1        REV 01   740-031980   AK80MCC          SFP+-10G-SR
    Xcvr 2        REV 01   740-031980   AK80KCM          SFP+-10G-SR
    Xcvr 3        REV 01   740-031980   AK80KE0          SFP+-10G-SR
  PIC 1                    BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0        REV 01   740-021310   C10F99155        SFP+-10G-LRM
    Xcvr 1        REV 01   740-021310   C10F99049        SFP+-10G-LRM
    Xcvr 2        REV 01   740-021310   C10F99128        SFP+-10G-LRM
    Xcvr 3        REV 01   740-021310   C10F99169        SFP+-10G-LRM
  PIC 2                    BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0        REV 01   740-031980   AK80LF3          SFP+-10G-SR
    Xcvr 1        REV 01   740-031980   163363A02597     SFP+-10G-SR
    Xcvr 2        REV 01   740-031980   163363A03060     SFP+-10G-SR
    Xcvr 3        REV 01   740-031980   163363A03057     SFP+-10G-SR
  PIC 3                    BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0        REV 01   740-031980   AK80LEX          SFP+-10G-SR
    Xcvr 1        REV 01   740-031980   AK80FEU          SFP+-10G-SR
    Xcvr 2        REV 01   740-031980   AK80FNM          SFP+-10G-SR
    Xcvr 3        REV 01   740-021308   AJQ0Q5G          SFP+-10G-SR
FPC 12            REV 30   750-028467   ZM5111           MPC 3D 16x 10GE
  CPU             REV 10   711-029089   ZP6607           AMPC PMB
  PIC 0                    BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0        REV 01   740-031980   AK80LJA          SFP+-10G-SR
    Xcvr 1        REV 01   740-031980   AK80MFZ          SFP+-10G-SR
    Xcvr 2        REV 01   740-031980   AK80NKL          SFP+-10G-SR
    Xcvr 3        REV 01   740-031980   AK80KF4          SFP+-10G-SR
  PIC 1                    BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0        REV 01   740-031980   AK80FBJ          SFP+-10G-SR
    Xcvr 1        REV 01   740-031980   AK80MM2          SFP+-10G-SR
    Xcvr 2        REV 01   740-031980   AK80LJV          SFP+-10G-SR
    Xcvr 3        REV 01   740-031980   AK80NXV          SFP+-10G-SR
  PIC 2                    BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0        REV 01   740-031980   AK80N1H          SFP+-10G-SR
    Xcvr 1        REV 01   740-031980   AK80NLS          SFP+-10G-SR
    Xcvr 2        REV 01   740-031980   AK80FL5          SFP+-10G-SR
    Xcvr 3        REV 01   740-031980   AK80NL9          SFP+-10G-SR
  PIC 3                    BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
    Xcvr 0        REV 01   740-031980   AK80NG2          SFP+-10G-SR
    Xcvr 1        REV 01   740-031980   AK80KDU          SFP+-10G-SR
    Xcvr 2        REV 01   740-031980   AK80MG1          SFP+-10G-SR
    Xcvr 3        REV 01   740-031980   AK80MM0          SFP+-10G-SR
FPC 13            REV 30   750-028467   ABBN0208         MPC 3D 16x 10GE
  CPU             REV 10   711-029089   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
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    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
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  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+
```



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      Xcvr 0         REV 01   740-030658   B11E04359        SFP+-10G-USR
      Xcvr 1         REV 01   740-030658   B11E02751        SFP+-10G-USR
      Xcvr 2         REV 01   740-030658   B11E02736        SFP+-10G-USR
      Xcvr 3         REV 01   740-030658   B11E01178        SFP+-10G-USR
FPC 19               REV 32   750-028467   ABBN6813         MPC 3D 16x 10GE
  CPU                REV 10   711-029089   ABBK6542         AMPC PMB
  PIC 0                       BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0         REV 01   740-031980   AK80NA3          SFP+-10G-SR
      Xcvr 1         REV 01   740-031980   AK80NLF          SFP+-10G-SR
      Xcvr 2         REV 01   740-031980   AK80MRH          SFP+-10G-SR
      Xcvr 3         REV 01   740-031980   AK80KE4          SFP+-10G-SR
  PIC 1                       BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0         REV 01   740-021308   973152A00030     SFP+-10G-SR
      Xcvr 1         REV 01   740-031980   AK80L9H          SFP+-10G-SR
      Xcvr 2         REV 01   740-031980   AK80ME8          SFP+-10G-SR
      Xcvr 3         REV 01   740-031980   AK80NLR          SFP+-10G-SR
  PIC 2                       BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0         REV 01   740-031980   AK80NG1          SFP+-10G-SR
      Xcvr 1         REV 01   740-031980   AK80MCA          SFP+-10G-SR
      Xcvr 2         REV 01   740-031980   AK80LFC          SFP+-10G-SR
      Xcvr 3         REV 01   740-031980   AK80LEM          SFP+-10G-SR
  PIC 3                       BUILTIN      BUILTIN          4x 10GE(LAN) SFP+
      Xcvr 0         REV 01   740-031980   AK80N9X          SFP+-10G-SR
      Xcvr 1         REV 01   740-031980   AK80LAC          SFP+-10G-SR
      Xcvr 2         REV 01   740-031980   AK80LF2          SFP+-10G-SR
      Xcvr 3         REV 01   740-031980   AK80N8T          SFP+-10G-SR
ADC 0                REV 13   750-043596   ABBX5561         Adapter Card
ADC 1                REV 13   750-043596   ABBX5546         Adapter Card
ADC 2                REV 13   750-043596   ABBX5535         Adapter Card
ADC 3                REV 13   750-043596   ABBX5552         Adapter Card
ADC 4                REV 13   750-043596   ABBX5581         Adapter Card
ADC 5                REV 13   750-043596   ABBX5545         Adapter Card
ADC 6                REV 13   750-043596   ABBX5554         Adapter Card
ADC 7                REV 07   750-043596   ABBV7194         Adapter Card
ADC 8                REV 07   750-043596   ABBV7251         Adapter Card
ADC 9                REV 07   750-043596   ABBV7202         Adapter Card
ADC 10               REV 13   750-043596   ABBX5579         Adapter Card
ADC 11               REV 13   750-043596   ABBX5548         Adapter Card
ADC 12               REV 13   750-043596   ABBX5575         Adapter Card
ADC 13               REV 13   750-043596   ABBX5539         Adapter Card
ADC 14               REV 13   750-043596   ABBX5555         Adapter Card
ADC 15               REV 13   750-043596   ABBX5557         Adapter Card
ADC 16               REV 13   750-043596   ABBX5536         Adapter Card
ADC 17               REV 13   750-043596   ABBX5559         Adapter Card
ADC 18               REV 13   750-043596   ABBX5537         Adapter Card
ADC 19               REV 11   750-043596   ABBW5685         Adapter Card
Fan Tray 0           REV 04   760-046960   ACAY0090         172mm FanTray - 6 Fans
Fan Tray 1           REV 04   760-046960   ACAY0088         172mm FanTray - 6 Fans
Fan Tray 2           REV 04   760-046960   ACAY0089         172mm FanTray - 6 Fans
Fan Tray 3           REV 04   760-046960   ACAY0108         172mm FanTray - 6 Fans
```

show chassis hardware models (MX2020 Router)

user@host > **show chassis hardware models**

```
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
```

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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
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ADC 19           REV 11   750-043596   ABBW5685         PROTO-ASSEMBLY
Fan Tray 0       REV 04   760-046960   ACAY0090
Fan Tray 1       REV 04   760-046960   ACAY0088
Fan Tray 2       REV 04   760-046960   ACAY0089
Fan Tray 3       REV 04   760-046960   ACAY0108
```

show chassis hardware clei-models (MX2020 Router)

user@ host > **show chassis hardware clei-models**

```
Hardware inventory:
Item             Version  Part number  CLEI code        FRU model number
Midplane         REV 27   750-040240   PROTOXCLEI       750-040240
FPM Board        REV 06   760-040242   PROTOXCLEI       760-040242
PSM 0            REV 01   740-045050   IPUPAJMKAA       MX2000-PSM-HC-DC-S-A
PSM 1            REV 01   740-045050   IPUPAJMKAA       MX2000-PSM-HC-DC-S-A
PSM 2            REV 01   740-045050   IPUPAJMKAA       MX2000-PSM-HC-DC-S-A
PSM 3            REV 01   740-045050   IPUPAJMKAA       MX2000-PSM-HC-DC-S-A
PSM 4            REV 01   740-045050   IPUPAJMKAA       MX2000-PSM-HC-DC-S-A
PSM 5            REV 01   740-045050   IPUPAJMKAA       MX2000-PSM-HC-DC-S-A
PSM 6            REV 01   740-045050   IPUPAJMKAA       MX2000-PSM-HC-DC-S-A
PSM 7            REV 01   740-045050   IPUPAJMKAA       MX2000-PSM-HC-DC-S-A
PSM 8            REV 01   740-045050   IPUPAJMKAA       MX2000-PSM-HC-DC-S-A
PSM 9            REV 03   740-045050   IPUPAJMKAA       MX2000-PSM-DC-S-A
PSM 10           REV 03   740-045050   IPUPAJMKAA       MX2000-PSM-DC-S-A
PSM 11           REV 03   740-045050   IPUPAJMKAA       MX2000-PSM-DC-S-A
PSM 12           REV 03   740-045050   IPUPAJMKAA       MX2000-PSM-DC-S-A
PSM 13           REV 03   740-045050   IPUPAJMKAA       MX2000-PSM-DC-S-A
PSM 15           REV 03   740-045050   IPUPAJMKAA       MX2000-PSM-DC-S-A
PDM 0            REV 01   740-045234
PDM 1            REV 01   740-045234
PDM 2            REV 01   740-045234   IPUPAJSKAA       MX2000-PDM-DC-S-A
Routing Engine 0 REV 02   740-041821                    RE-S-1800X4-16G-S
Routing Engine 1 REV 02   740-041821                    RE-S-1800X4-16G-S
CB 0             REV 08   750-040257   PROTOXCLEI       750-040257
CB 1             REV 04   750-040257   PROTOXCLEI       750-040257
SFB 0            REV 05   711-044466   IPUCBA6CAA       MX2000-SFB-S
SFB 1            REV 05   711-044466   IPUCBA6CAA       MX2000-SFB-S
SFB 2            REV 05   711-044466   IPUCBA6CAA       MX2000-SFB-S
SFB 4            REV 05   711-044466   IPUCBA6CAA       MX2000-SFB-S
SFB 5            REV 05   711-044466   IPUCBA6CAA       MX2000-SFB-S
SFB 7            REV 05   711-044466   IPUCBA6CAA       MX2000-SFB-S
FPC 0            REV 30   750-028467                    MPC-3D-16XGE-SFPP
FPC 1            REV 30   750-028467                    MPC-3D-16XGE-SFPP
FPC 2            REV 30   750-028467                    MPC-3D-16XGE-SFPP
FPC 3            REV 32   750-028467                    MPC-3D-16XGE-SFPP
FPC 4            REV 32   750-028467                    MPC-3D-16XGE-SFPP
FPC 5            REV 32   750-028467                    MPC-3D-16XGE-SFPP
FPC 6            REV 30   750-028467                    MPC-3D-16XGE-SFPP
FPC 7            REV 32   750-028467                    MPC-3D-16XGE-SFPP
FPC 8            REV 30   750-028467                    MPC-3D-16XGE-SFPP
FPC 9            REV 32   750-028467                    MPC-3D-16XGE-SFPP
FPC 10           REV 30   750-028467                    MPC-3D-16XGE-SFPP
FPC 11           REV 32   750-028467                    MPC-3D-16XGE-SFPP
FPC 12           REV 30   750-028467                    MPC-3D-16XGE-SFPP
FPC 13           REV 30   750-028467                    MPC-3D-16XGE-SFPP
FPC 14           REV 23   750-028467                    MPC-3D-16XGE-SFPP
FPC 15           REV 32   750-028467                    MPC-3D-16XGE-SFPP
FPC 16           REV 30   750-028467                    MPC-3D-16XGE-SFPP
FPC 17           REV 32   750-028467                    MPC-3D-16XGE-SFPP
FPC 18           REV 30   750-028467                    MPC-3D-16XGE-SFPP
FPC 19           REV 32   750-028467                    MPC-3D-16XGE-SFPP
ADC 0            REV 13   750-043596   PROTOXCLEI       PROTO-ASSEMBLY
ADC 1            REV 13   750-043596   PROTOXCLEI       PROTO-ASSEMBLY
```



```
ADC 2            REV 13   750-043596   IPUCBA8CAA        MX2000-LC-ADAPTER
ADC 3            REV 13   750-043596   IPUCBA8CAA        MX2000-LC-ADAPTER
ADC 4            REV 13   750-043596   IPUCBA8CAA        MX2000-LC-ADAPTER
ADC 5            REV 13   750-043596   PROTOXCLEI        PROTO-ASSEMBLY
ADC 6            REV 13   750-043596   PROTOXCLEI        PROTO-ASSEMBLY
ADC 7            REV 07   750-043596   PROTOXCLEI        MX2000-LC-ADAPTER
ADC 8            REV 07   750-043596   PROTOXCLEI        MX2000-LC-ADAPTER
ADC 9            REV 07   750-043596   PROTOXCLEI        MX2000-LC-ADAPTER
ADC 10           REV 13   750-043596   IPUCBA8CAA        MX2000-LC-ADAPTER
ADC 12           REV 13   750-043596   IPUCBA8CAA        MX2000-LC-ADAPTER
ADC 13           REV 13   750-043596   PROTOXCLEI        PROTO-ASSEMBLY
ADC 14           REV 13   750-043596   PROTOXCLEI        PROTO-ASSEMBLY
ADC 15           REV 13   750-043596   IPUCBA8CAA        MX2000-LC-ADAPTER
ADC 16           REV 13   750-043596   PROTOXCLEI        PROTO-ASSEMBLY
ADC 17           REV 13   750-043596   PROTOXCLEI        PROTO-ASSEMBLY
ADC 18           REV 13   750-043596   PROTOXCLEI        PROTO-ASSEMBLY
ADC 19           REV 11   750-043596   PROTOXCLEI        PROTO-ASSEMBLY
Fan Tray 0       REV 04   760-046960
Fan Tray 1       REV 04   760-046960
Fan Tray 2       REV 04   760-046960
Fan Tray 3       REV 04   760-046960
```

show chassis hardware (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            2xOC12/8xOC3 CC-CE
    PIC 2                 BUILTIN      BUILTIN           2xOC12/8xOC3 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

```
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 ff  I2C Hex Data:
```

Application Services Modular Line Card)

```
  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 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:               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 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 ff
  Address 0x40: ff ff ff ff 00 50 52 4f 54 4f 58 43 4c 45 49 37
  Address 0x50: 31 31 2d 30 33 38 31 37 33 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 30 34 00 ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 60 00 00 00 00 00 00 00 00 00 00 00 00
  MIC 0           REV 01   750-037214   ZH3764          AS-MSC
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
 P/N:          750-037214       S/N:               S/N ZH3764
 Assembly ID:  0x0a44           Assembly Version:  01.01
 Date:         07-04-2011       Assembly Flags:    0x00
 Version:      REV 01
 ID: AS-MSC
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff 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 ff
  Address 0x40: ff ff ff ff 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 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-MSC
FPC 4             REV 30   750-028467   ABBN0232        MPC 3D 16x 10GE
 Jedec Code:   0x7fb0           EEPROM Version:    0x01
```

show chassis hardware (T320 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item              Version  Part number  Serial number     Description
Chassis                                 19093             T320
Midplane          REV 04   710-004339   BC1436            T320 Backplane
FPM GBUS          REV 03   710-004461   BC1407            T320 FPM Board
FPM Display       REV 04   710-002897   BE0763            FPM Display
CIP               REV 05   710-002895   BB2311            T Series CIP
PEM 0             Rev 01   740-004359   NB12546           Power Entry Module
SCG 0             REV 06   710-004455   AY4522            T320 Sonet
Clock Gen.
Routing Engine 0                                          unknown
CB 0              REV 13   710-002728   BC1577            T Series
Control Board
CB 1              REV 13   710-002728   BC1595            T Series
```



```
Control Board
FPC 1            REV 09   710-007531   HS1572          FPC Type 2
   CPU            REV 15   710-001726   HR8763          FPC CPU
   PIC 0          REV 01   750-010618   CB5579          4x G/E SFP,
1000 BASE
     SFP 0        REV 01   740-007326   P5809Z1         SFP-SX
     SFP 1        REV 01   740-007326   P4Q10XU         SFP-SX
     SFP 2                 NON-JNPR     RA45020031      SFP-SX
     SFP 3                 NON-JNPR     RA45020032      SFP-SX
   PIC 1          REV 01   750-010618   CD9587          4x G/E SFP,
1000 BASE
     SFP 0                 NON-JNPR     P5A08QZ         SFP-T
     SFP 1        REV 01   740-007326   P4Q133K         SFP-SX
     SFP 2        REV 01   740-007326   P5809YY         SFP-SX
     SFP 3        REV 01   740-007327   4C81704         SFP-LX
   MMB 1          REV 03   710-005555   HR9401          MMB-288mbit
   PPB 0          REV 04   710-003758   HR2886          PPB Type 2
FPC 2            REV 07   710-005860   HP2392          FPC Type 1
   CPU            REV 14   710-001726   HP7797          FPC CPU
   PIC 0          REV 02   750-007643   HM0853          1x G/E QPP,
1000 BASE
     SFP 0        REV 01   740-007326   P11E9JJ         SFP-SX
   MMB 1          REV 02   710-005555   HN2379          MMB-288mbit
   PPB 0          REV 04   710-003758   HP8092          PPB Type 2
FPC 3            REV 07   710-005860   HP2393          FPC Type 1
   CPU            REV 14   710-001726   HP0968          FPC CPU
   PIC 0          REV 01   750-010240   CB5363          1x G/E SFP,
1000 BASE
     SFP 0        REV 01   740-007326   P4R0PNH         SFP-SX
   PIC 1          REV 03   750-003034   HD2832          4x OC-3 SONET,
SMIR
   MMB 1          REV 02   710-005555   HN6307          MMB-288mbit
   PPB 0          REV 04   710-003758   HP5051          PPB Type 2
FPC 4            REV 01   710-010845   JD3872          FPC Type 4
   CPU            REV 02   710-011481   JB6042          FPC CPU
 5            REV 01   710-005802   BC1566          FPC Type 2
   CPU            REV 09   710-001726   AY4922          FPC CPU
   PIC 0          REV 02   750-008155   BE2114          2x G/E QPP,
1000 BASE
     SFP 0        REV 01   740-007326   P4R0PMQ         SFP-SX
     SFP 1        REV 01   740-007326   P4R0PN9         SFP-SX
   PIC 1          REV 01   750-008155   BE2116          2x G/E QPP,
1000 BASE
     SFP 0        REV 01   740-007326   P4R0PNZ         SFP-SX
     SFP 1                 NON-JNPR     2908            SFP-T
   MMB 1          REV 01   710-005555   AZ2246          MMB-288mbit
   PPB 0          REV 03   710-003758   AY4839          PPB Type 2
FPC 7            REV 01   710-005803   AZ2123          FPC Type 3
...
```

show chassis hardware (T640 Router)

user@host> **show chassis hardware**

```
Hardware inventory:
Item             Version  Part number  Serial number   Description
Chassis                                19182           T640
Midplane         REV 04   710-002726   AX5608          T640 Backplane
FPM GBUS         REV 02   710-002901   HE3064          T640 FPM Board
FPM Display      REV 02   710-002897   HE7864          FPM Display
CIP              REV 05   710-002895   HA5024          T Series CIP
PEM 0            Rev 02   740-029522   VH26235         AC PEM 10kW US
PEM 1            Rev 02   740-029522   VH26230         AC PEM 10kW US
SCG 0            REV 03   710-003423   HA4508          T640 Sonet Clock Gen.
```

```
Routing Engine 0 REV 02   740-005022   210865700483      RE-3.0 (RE-600)
CB 0             REV 01   710-002728   HD3044            T Series Control Board
FPC 2            REV 04   710-001721   HD5572            FPC Type 3
  CPU            REV 06   710-001726   HA4712            FPC CPU
  PIC 1          REV 03   750-009567   HV2331            1x 10GE(LAN),XENPAK
    SFP 0        REV 01   740-009898   USC202R103        XENPAK-SR
  PIC 2          REV 03   750-009567   HV2332            1x 10GE(LAN),XENPAK
    SFP 0        REV 01   740-011268   USC202R112        XENPAK-ZR
  PIC 3          REV 03   750-009567   HX4416            1x 10GE(LAN),XENPAK
    SFP 0        REV 01   740-012056   434TC004          XENPAK-CX4
  PIC 4          REV 03   750-009567   HX4420            1x 10GE(LAN),XENPAK
    SFP 0        REV 01   740-012058   434TC124          XENPAK-LX4
FPC 5            REV 01   710-013553   JE4839            E2-FPC Type 1
  CPU            REV 01   710-013569   JW9163            FPC CPU
  PIC 0          REV 01   750-009567   HX4419            1x 10GE(LAN),XENPAK
    SFP 0        REV 01   740-009898   USC202RT05        XENPAK-LR
  PIC 1          REV 03   750-009567   HN7426            1x 10GE(LAN),XENPAK
    SFP 0        REV 01   740-009550   03L90051          XENPAK-ER
  PIC 2          REV 03   750-009467   HT7423            1x 10GE(LAN),XENPAK
    SFP 0                 NON-JNPR                       UNKNOWON
  PIC 3          REV 04   750-005100   AY4850            1x 10GE(LAN),DWDM
FPC 4            REV 01   710-010845   JD3872            FPC Type 4
  CPU            REV 02   710-011481   JB6042            FPC CPU
Fan Tray 0                                               Front Top Fan Tray
Fan Tray 1                                               Front Bottom Fan Tray
Fan Tray 2                                               Rear Fan Tray
```

show chassis hardware models (T640 Router)

```
user@host> show chassis hardware models
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Midplane         REV 04   710-002726                     CHAS-BP-T640-S
FPM Display      REV 02   710-002897                     CRAFT-T640-S
CIP              REV 05   710-002895                     CIP-L-T640-S
PEM 0            Rev 01   740-002595                     PWR-T-DC-S
SCG 0            REV 04   710-003423                     SCG-T-S
SCG 1            REV 04   710-003423                     SCG-T-S
Routing Engine 0 REV 01   740-005022                     RE-600-2048-S
Routing Engine 1 REV 07   740-005022                     RE-600-2048-S
CB 0             REV 06   710-002726                     CHAS-BP-T640-S
CB 1             REV 06   710-002728                     CB-L-T-S
FPC 5            REV 05   710-007527                     T640-FPC2
  PIC 0          REV 05   750-002510                     PB-2GE-SX
  PIC 1          REV 05   750-001901                     PB-4OC12-SON-SMIR
FPC 6            REV 03   710-001721                     T640-FPC3
  PIC 1          REV 01   750-009553                     PC-4OC48-SON-SFP
SIB 4            REV 02   750-005486                     SIB-I-T640-S
Fan Tray 0                                               FANTRAY-T-S
Fan Tray 1                                               FANTRAY-T-S
Fan Tray 2                                               FAN-REAR-TX-T640-S
```

show chassis hardware extensive (T640 Router)

```
user@host> show chassis hardware extensive
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                                  T640
 Jedec Code:    0x7fb0           EEPROM Version:    0x01
 P/N:         ...........      S/N:              ...........
 Assembly ID:  0x0507            Assembly Version:  00.00
 Date:         00-00-0000        Assembly Flags:    0x00
 Version:     ...........
 ID: Gibson LCC Chassis
```



```
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 05 07 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x20: ff ff ff ff ff ff ff ff ff ff ff ff 00 00 00 00
  Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane         REV 04   710-002726   AX5633
 Jedec Code:   0x7fb0          EEPROM Version:    0x01
 P/N:          710-002726.     S/N:               S/N AX5633.
 Assembly ID:  0x0127          Assembly Version:  01.04
 Date:         06-27-2001      Assembly Flags:    0x00
 Version:      REV 04.....
 ID: Gibson Backplane
 Board Information Record:
  Address 0x00: ad 01 08 00 00 90 69 0e f8 00 ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 01 ff 01 27 01 04 52 45 56 20 30 34 00 00
  Address 0x10: 00 00 00 00 37 31 30 2d 30 30 32 37 32 36 00 00
  Address 0x20: 53 2f 4e 20 41 58 35 36 33 33 00 00 00 1b 06 07
  Address 0x30: d1 ff ff ff ad 01 08 00 00 90 69 0e f8 00 ff ff
  Address 0x40: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
FPM GBUS         REV 02   710-002901   HE3245
 ...
FPM Display      REV 02   710-002897   HA4873
 ...
CIP              REV 05   710-002895   HA4729
...
PEM 1            RevX02   740-002595   MD21815          Power Entry Module
 ...
SCG 0            REV 04   710-003423   HF6023
 ...
SCG 1            REV 04   710-003423   HF6061
 ...
Routing Engine 0 REV 01   740-005022   210865700292     RE-3.0
...
CB 0             REV 06   710-002728   HE3614
...
FPC 1            REV 01   710-002385   HE3009           FPC Type 1
...              REV 06   710-001726   HC0010
```

show chassis hardware (T4000 Router)

user@host> **show chassis hardware**

```
Hardware inventory:
Item             Version  Part number  Serial number    Description
Chassis                                JN1172F25AHA     T4000
Midplane         REV 01   710-027486   RC8355           T-series Backplane
FPM GBUS         REV 13   710-002901   BBAE0927         T640 FPM Board
FPM Display      REV 01   710-021387   EF6764           T1600 FPM Display
CIP              REV 06   710-002895   BBAD9210         T-series CIP
PEM 0            REV 01   740-036442   VA00016          Power Entry Module 6x60
SCG 0            REV 18   710-003423   BBAD7248         T640 Sonet Clock Gen.
SCG 1            REV 18   710-003423   BBAE3874         T640 Sonet Clock Gen.
Routing Engine 0 REV 05   740-026941   P737F-002248     RE-DUO-1800
Routing Engine 1 REV 06   740-026941   P737F-002653     RE-DUO-1800
CB 0             REV 09   710-022597   ED0295           LCC Control Board
CB 1             REV 09   710-022597   EA6050           LCC Control Board
FPC 0            REV 26   750-032819   EK1173           FPC Type 5-3D
  CPU            REV 12   711-030686   EJ8584           SNG PMB
  PIC 0          REV 07   750-034624   EF6837           12x10GE (LAN/WAN) SFPP
    Xcvr 0       REV 01   740-031980   123363A01145     SFP+-10G-SR
```

```
    Xcvr 1       REV 01   740-031980   123363A01147      SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AJJ01P3           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B10M03256         SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   AJJ01M2           SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   123363A01137      SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   AJJ01PN           SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   AJJ01NW           SFP+-10G-SR
    Xcvr 8       REV 01   740-031980   123363A01139      SFP+-10G-SR
    Xcvr 9       REV 01   740-031980   AJJ01KE           SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   123363A01336      SFP+-10G-SR
    Xcvr 11      REV 01   740-031980   B10M01325         SFP+-10G-SR
  PIC 1          REV 07   750-034624   EF6800            12x10GE (LAN/WAN) SFPP
    Xcvr 0       REV 01   740-031980   AJJ01SA           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AJJ01QZ           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AJH0217           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AJJ01TE           SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   AJJ01KV           SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   AJJ01MU           SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   AJJ01R0           SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   AJJ01TC           SFP+-10G-SR
    Xcvr 8       REV 01   740-031980   AJJ0364           SFP+-10G-SR
    Xcvr 9       REV 01   740-031980   AJD0GV3           SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   B10M03343         SFP+-10G-SR
    Xcvr 11      REV 01   740-031980   AJJ01QJ           SFP+-10G-SR
  LMB 0          REV 05   711-034381   EJ8490            Type-0 LMB
  LMB 1          REV 04   711-035774   EJ8517            Type-1 LMB
  LMB 2          REV 05   711-034381   EJ8489            Type-0 LMB
FPC 3            REV 07   750-032819   EG3637            FPC Type 5-3D
  CPU            REV 09   711-030686   EG0150            SNG PMB
  PIC 0          REV 08   750-035293   EF3657            1x100GE
    Xcvr 0       REV 01   740-032210   C22CQNJ           CFP-100G-LR4
  PIC 1          REV 10   750-034624   BBAN4098          12x10GE (LAN/WAN) SFPP
    Xcvr 0       REV 01   740-031980   B11J04902         SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11J04891         SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AJJ01MX           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11J04183         SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   B11J04894         SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   B11J04184         SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   B11J04897         SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   B11J04899         SFP+-10G-SR
    Xcvr 8       REV 01   740-031980   AJJ01TV           SFP+-10G-SR
    Xcvr 9       REV 01   740-031980   B11J04057         SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   AJJ01M4           SFP+-10G-SR
    Xcvr 11      REV 01   740-031980   B11J04905         SFP+-10G-SR
  LMB 0          REV 04   711-034381   EG1524            Type-0 LMB
  LMB 1          REV 03   711-035774   EG0345            Type-1 LMB
  LMB 2          REV 04   711-034381   EG1522            Type-0 LMB
FPC 5            REV 03   710-033871   BBAJ0768          FPC Type 4-ES
  CPU            REV 11   710-016744   BBAH9342          ST-PMB2
  PIC 0          REV 09   750-029262   EE6789            100GE
  PIC 1          REV 03   750-034781   EE6655            100GE CFP
    Xcvr 0       REV 01   740-032210   J11A22334         CFP-100G-LR4
  BRIDGE 0       REV 03   711-029995   EE6572            100GE Bridge Board
  MMB 0          REV 07   710-025563   BBAJ4657          ST-MMB2
  MMB 1          REV 07   710-025563   BBAJ3073          ST-MMB2
FPC 6            REV 05   750-010153   EF4936            FPC Type 5-3D
  CPU            REV 06   711-030686   EF4189            SNG PMB
  PIC 0          REV 10   750-034624   BBAN4109          12x10GE (LAN/WAN) SFPP
    Xcvr 0       REV 01   740-031980   B11J04895         SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11J04898         SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   B11J04021         SFP+-10G-SR
```



```
    Xcvr 3        REV 01   740-031980   B11J04903        SFP+-10G-SR
    Xcvr 4        REV 01   740-031980   B11J04311        SFP+-10G-SR
    Xcvr 5        REV 01   740-031980   B11J04059        SFP+-10G-SR
    Xcvr 6        REV 01   740-031980   B11J04016        SFP+-10G-SR
    Xcvr 7        REV 01   740-031980   B11J04017        SFP+-10G-SR
    Xcvr 8        REV 01   740-031980   B11J04887        SFP+-10G-SR
    Xcvr 9        REV 01   740-031980   B11J04297        SFP+-10G-SR
    Xcvr 10       REV 01   740-031980   B11J04893        SFP+-10G-SR
    Xcvr 11       REV 01   740-031980   B11J04022        SFP+-10G-SR
  PIC 1           REV 02   750-034624   EE3711           12x10GE (LAN/WAN) SFPP
    Xcvr 0        REV 01   740-031980   AJH033X          SFP+-10G-SR
    Xcvr 1        REV 01   740-031980   AJJ01N0          SFP+-10G-SR
    Xcvr 2        REV 01   740-031980   AJJ01SV          SFP+-10G-SR
    Xcvr 3        REV 01   740-031980   AJJ032L          SFP+-10G-SR
    Xcvr 4        REV 01   740-031980   B10M01593        SFP+-10G-SR
    Xcvr 5        REV 01   740-031980   AJD0FF1          SFP+-10G-SR
    Xcvr 6        REV 01   740-031980   AJJ01NU          SFP+-10G-SR
    Xcvr 7        REV 01   740-031980   123363A01305     SFP+-10G-SR
    Xcvr 8        REV 01   740-031980   B10M00361        SFP+-10G-SR
    Xcvr 9        REV 01   740-031980   AJJ01M7          SFP+-10G-SR
    Xcvr 10       REV 01   740-031980   AJJ032X          SFP+-10G-SR
    Xcvr 11       REV 01   740-031980   AJJ01PG          SFP+-10G-SR
  LMB 0           REV 04   711-034381   EF3838           Type-0 LMB
  LMB 1           REV 03   711-035774   EF3821           Type-1 LMB
  LMB 2           REV 04   711-034381   EF3834           Type-0 LMB
SPMB 0            REV 05   710-023321   ED1990           LCC Switch CPU
SPMB 1            REV 05   710-023321   EA2768           LCC Switch CPU
SIB 0             REV 02   711-036340   EF8802           SIB-HC-3D
SIB 1             REV 07   711-036340   EG2286           SIB-HC-3D
SIB 2             REV 07   711-036340   EG2252           SIB-HC-3D
SIB 3             REV 02   711-036340   EF1358           SIB-HC-3D
SIB 4             REV 02   711-036340   EF8806           SIB-HC-3D
Fan Tray 0                                               Front Top Fan Tray
Fan Tray 1                                               Front Bottom Fan Tray
-- Rev 2
Fan Tray 2                                               Rear Fan Tray -- Rev 3
```

show chassis hardware (T4000 Router with 16

```
user@host> show chassis hardware
Hardware inventory:
Item              Version  Part number  Serial number    Description
```

GB line card chassis (LCC) Routing Engine)

```
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 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      IPUIBKLMAA        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

```
user@host> show chassis hardware detail
Hardware inventory:
```


detail (T4000 Router)

```
Item             Version  Part number  Serial number     Description
Chassis                                JN1172F25AHA      T4000
Midplane         REV 01   710-027486   RC8355            T-series Backplane
FPM GBUS         REV 13   710-002901   BBAE0927          T640 FPM Board
FPM Display      REV 01   710-021387   EF6764            T1600 FPM Display
CIP              REV 06   710-002895   BBAD9210          T-series CIP
PEM 0            REV 01   740-036442   VA00016           Power Entry Module 6x60
SCG 0            REV 18   710-003423   BBAD7248          T640 Sonet Clock Gen.
SCG 1            REV 18   710-003423   BBAE3874          T640 Sonet Clock Gen.
Routing Engine 0 REV 05   740-026941   P737F-002248      RE-DUO-1800
  ad0     3823 MB  SMART CF            2009121602A661576157 Compact Flash
  ad1    59690 MB  STEC MACH-8 SSD     STM000103FDB      Disk 1
Routing Engine 1 REV 06   740-026941   P737F-002653      RE-DUO-1800
  ad0     3823 MB  SMART CF            201011150153F52CF52C Compact Flash
  ad1    62720 MB  SMART Lite SATA Drive 2010110900150A880A88 Disk 1
CB 0             REV 09   710-022597   ED0295            LCC Control Board
CB 1             REV 09   710-022597   EA6050            LCC Control Board
FPC 0            REV 26   750-032819   EK1173            FPC Type 5-3D
  CPU            REV 12   711-030686   EJ8584            SNG PMB
  PIC 0          REV 07   750-034624   EF6837            12x10GE (LAN/WAN) SFPP
    Xcvr 0       REV 01   740-031980   123363A01145      SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   123363A01147      SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AJJ01P3           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B10M03256         SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   AJJ01M2           SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   123363A01137      SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   AJJ01PN           SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   AJJ01NW           SFP+-10G-SR
    Xcvr 8       REV 01   740-031980   123363A01139      SFP+-10G-SR
    Xcvr 9       REV 01   740-031980   AJJ01KE           SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   123363A01336      SFP+-10G-SR
    Xcvr 11      REV 01   740-031980   B10M01325         SFP+-10G-SR
  PIC 1          REV 07   750-034624   EF6800            12x10GE (LAN/WAN) SFPP
    Xcvr 0       REV 01   740-031980   AJJ01SA           SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   AJJ01QZ           SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AJH0217           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   AJJ01TE           SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   AJJ01KV           SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   AJJ01MU           SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   AJJ01R0           SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   AJJ01TC           SFP+-10G-SR
    Xcvr 8       REV 01   740-031980   AJJ0364           SFP+-10G-SR
    Xcvr 9       REV 01   740-031980   AJD0GV3           SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   B10M03343         SFP+-10G-SR
    Xcvr 11      REV 01   740-031980   AJJ01QJ           SFP+-10G-SR
  LMB 0          REV 05   711-034381   EJ8490            Type-0 LMB
  LMB 1          REV 04   711-035774   EJ8517            Type-1 LMB
  LMB 2          REV 05   711-034381   EJ8489            Type-0 LMB
FPC 3            REV 07   750-032819   EG3637            FPC Type 5-3D
  CPU            REV 09   711-030686   EG0150            SNG PMB
  PIC 0          REV 08   750-035293   EF3657            1x100GE
    Xcvr 0       REV 01   740-032210   C22CQNJ           CFP-100G-LR4
  PIC 1          REV 10   750-034624   BBAN4098          12x10GE (LAN/WAN) SFPP
    Xcvr 0       REV 01   740-031980   B11J04902         SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11J04891         SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AJJ01MX           SFP+-10G-SR
    Xcvr 3       REV 01   740-031980   B11J04183         SFP+-10G-SR
    Xcvr 4       REV 01   740-031980   B11J04894         SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   B11J04184         SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   B11J04897         SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   B11J04899         SFP+-10G-SR
```

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    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

```
user@host> show chassis hardware models

Hardware inventory:
```

Router)

```
Item             Version  Part number  Serial number     FRU model number
Midplane         REV 01   710-027486   RC8355            CHAS-BP-T1600-S
FPM Display      REV 01   710-021387   EF6764            CRAFT-T1600-S
CIP              REV 06   710-002895   BBAD9210          CIP-L-T640-S
PEM 0            REV 01   740-036442   VA00016           PWR-T-6-60-DC
SCG 0            REV 18   710-003423   BBAD7248          SCG-T-S
SCG 1            REV 18   710-003423   BBAE3874          SCG-T-S
Routing Engine 0 REV 05   740-026941   P737F-002248      RE-DUO-C1800-8G-S
Routing Engine 1 REV 06   740-026941   P737F-002653      RE-DUO-C1800-8G-S
CB 0             REV 09   710-022597   ED0295            CB-LCC-S
CB 1             REV 09   710-022597   EA6050            CB-LCC-S
FPC 3
  PIC 0          REV 08   750-035293   EF3657            PF-1CGE-CFP
  PIC 1          REV 10   750-034624   BBAN4098          PF-12XGE-SFPP
FPC 5            REV 03   710-033871   BBAJ0768          T1600-FPC4-ES
  PIC 1          REV 03   750-034781   EE6655            PD-1CE-CFP-FPC4
FPC 6
  PIC 0          REV 10   750-034624   BBAN4109          PF-12XGE-SFPP
Fan Tray 0                                               FANTRAY-T-S
Fan Tray 1                                               FANTRAY-T4000-S
Fan Tray 2                                               FAN-REAR-TXP-LCC
```

show chassis hardware lcc (TX Matrix Router)

user@host> **show chassis hardware lcc 0**

```
lcc0-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                65751             T640
Midplane         REV 03   710-005608   RA1408            T640 Backplane
FPM GBUS         REV 09   710-002901   RA2784            T640 FPM Board
FPM Display      REV 05   710-002897   RA2825            FPM Display
CIP              REV 06   710-002895   HT0684            T Series CIP
PEM 0            Rev 11   740-002595   PM18483           Power Entry Module
PEM 1            Rev 11   740-002595   qb13984           Power Entry Module
SCG 0            REV 11   710-003423   HT0022            T640 Sonet Clock Gen.
Routing Engine 0 REV 13   740-005022   210865700363      RE-3.0 (RE-600)
CB 0             REV 03   710-007655   HW1195            Control Board (CB-T)
FPC 1            REV 05   710-007527   HM3245            FPC Type 2
  CPU            REV 14   710-001726   HM1084            FPC CPU
  PIC 0          REV 02   750-007218   AZ1112            2x OC-12 ATM2 IQ, SMIR
  PIC 1          REV 02   750-007745   HG3462            4x OC-3 SONET, SMIR
  PIC 2          REV 14   750-001901   BA5390            4x OC-12 SONET, SMIR
  PIC 3          REV 09   750-008155   HS3012            2x G/E IQ, 1000 BASE
    SFP 0                 NON-JNPR     P1186TY           SFP-S
    SFP 1        REV 01   740-007326   P11WLTF           SFP-SX
  MMB 1          REV 02   710-005555   HL7514            MMB-288mbit
  PPB 0          REV 04   710-003758   HM4405            PPB Type 2
  PPB 1          REV 04   710-003758   AV1960            PPB Type 2
FPC 2            REV 08   710-010154   HZ3578            E-FPC Type 3
  CPU            REV 05   710-010169   HZ3219            FPC CPU-Enhanced
  PIC 0          REV 02   750-009567   HX2882            1x 10GE(LAN),XENPAK
    SFP 0        REV 01   740-009898   USC202U709        XENPAK-LR
  PIC 1          REV 03   750-003336   HJ9954            4x OC-48 SONET, SMSR
  PIC 2          REV 01   750-004535   HC0235            1x OC-192 SM SR1
  PIC 3          REV 07   750-007141   HX1699            10x 1GE(LAN), 1000 BASE

    SFP 0        REV 01   740-007326   2441042           SFP-SX
    SFP 1        REV 01   740-007326   2441027           SFP-SX
  MMB 0          REV 03   710-010171   HV2365            MMB-5M3-288mbit
  MMB 1          REV 03   710-010171   HZ3888            MMB-5M3-288mbit
SPMB 0           REV 09   710-003229   HW5245            T Series Switch CPU
```



```
SIB 3            REV 07   710-005781   HR5927           SIB-L8-F16
  B Board        REV 06   710-005782   HR5971           SIB-L8-F16 (B)
SIB 4            REV 07   710-005781   HR5903           SIB-L8-F16
  B Board        REV 06   710-005782   HZ5275           SIB-L8-F16 (B)
```

show chassis hardware scc (TX Matrix Router)

```
user@host> show chassis hardware scc
scc-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number    Description
Chassis                                                 TX Matrix
Midplane         REV 04   710-004396   RB0014           SCC Midplane
FPM GBUS         REV 04   710-004617   HW9141           SCC FPM Board
FPM Display      REV 04   710-004619   HS5950           SCC FPM
CIP 0            REV 01   710-010218   HV9151           SCC CIP
CIP 1            REV 01   710-010218   HV9152           SCC CIP
PEM 1            Rev 11   740-002595   QB13977          Power Entry Module
Routing Engine 0 REV 05   740-008883   P11123900153     RE-4.0 (RE-1600)
CB 0             REV 01   710-011709   HR5964           Control Board (CB-TX)
SPMB 0           REV 09   710-003229   HW5293           T Series Switch CPU
SIB 3
SIB 4            REV 01   710-005839   HW1177           SIB-S8-F16
  B Board        REV 01   710-005840   HW1202           SIB-S8-F16 (B)
```

show chassis hardware (T1600 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number    Description
Chassis                                B2703            T1600
Midplane         REV 03   710-005608   RC4137           T640 Backplane
FPM GBUS         REV 10   710-002901   DT7062           T640 FPM Board
FPM Display      REV 05   710-002897   DS3067           FPM Display
CIP              REV 06   710-002895   DT3386           T-series CIP
PEM 0            Rev 07   740-017906   UA26344          Power Entry Module 3x80
PEM 1            Rev 18   740-002595   UF38441          Power Entry Module
SCG 0            REV 15   710-003423   DV0941           T640 Sonet Clock Gen.
Routing Engine 0 REV 08   740-014082   9009014502       RE-A-2000
Routing Engine 1 REV 07   740-014082   9009009591       RE-A-2000
CB 0             REV 05   710-007655   JA9360           Control Board (CB-T)
CB 1             REV 03   710-017707   DT3251           Control Board (CB-T)
FPC 0            REV 07   710-013558   DR4253           E2-FPC Type 2
  CPU            REV 05   710-013563   DS3902           FPC CPU-Enhanced
  PIC 0          REV 01   750-010618   CB5446           4x G/E SFP, 1000 BASE
    Xcvr 0       REV 01   740-011613   P9F11CW          SFP-SX
    Xcvr 1       REV 01   740-011613   P9F15C2          SFP-SX
    Xcvr 2       REV 01   740-011782   PB94K0L          SFP-SX
  PIC 1          REV 06   750-001900   HB6399           1x OC-48 SONET, SMSR
  PIC 2          REV 14   750-001901   AP1092           4x OC-12 SONET, SMIR
  PIC 3          REV 07   750-001900   AR8275           1x OC-48 SONET, SMSR
  MMB 1          REV 07   710-010171   DS1524           MMB-5M3-288mbit
FPC 1            REV 06   710-013553   DL9067           E2-FPC Type 1
  CPU            REV 04   710-013563   DM1685           FPC CPU-Enhanced
  PIC 0          REV 08   750-001072   AB1688           1x G/E, 1000 BASE-SX
  PIC 1          REV 10   750-012266   JX5519           4x 1GE(LAN), IQ2
    Xcvr 0       REV 01   740-011613   AM0812S8UK6      SFP-SX
    Xcvr 2       REV 01   740-011613   AM0812S8UK1      SFP-SX
    Xcvr 3       REV 01   740-011782   P8N1YHG          SFP-SX
  PIC 2         REV 22   750-005634   DP0083          1x CHOC12 IQ SONET, SMIR

  MMB 1          REV 07   710-008923   DN1862           MMB 3M 288-bit
FPC 2            REV 01   710-005548   HJ9899           FPC Type 3
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    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   P9P0XV4          SFP-SX
      Xcvr 2        REV 01   740-011782   P9M0TNX          SFP-SX
      Xcvr 4        REV 01   740-011782   P9B0TTP          SFP-SX
      Xcvr 5                 NON-JNPR     PBS4LED          SFP-SX
    PIC 2           REV 17   750-009553   RL0212           4x OC-48 SONET
      Xcvr 0        REV 01   740-011785   PDS3T8G          SFP-SR
    PIC 3           REV 32   750-003700   DL1279           1x OC-192 12xMM VSR
    MMB 0           REV 01   710-010171   HR0821           MMB-288mbit
    MMB 1           REV 01   710-010171   HR0818           MMB-288mbit
  FPC 4             REV 16   710-013037   EB4919           FPC Type 4-ES
    CPU             REV 09   710-016744   BBAA4382         ST-PMB2
    PIC 0           REV 03   711-029996   EB1569           100GE
    PIC 1           REV 05   711-029999   EB9983           100GE CFP
      Xcvr 0        REV 0    740-032210   J10G80746        CFP-100G-LR4
    BRIDGE 0        REV 02   711-029995   EB2235           100GE Bridge Board
    MMB 0           REV 04   710-025563   BBAA7112         ST-MMB2
    MMB 1           REV 04   710-025563   BBAA7149         ST-MMB2
  FPC 5             REV 02   710-013037   DE3407           FPC Type 4-ES
    CPU             REV 04   710-016744   DA2124           ST-PMB2
    PIC 0           REV 16   750-012518   DF2554           4x OC-192 SONET XFP
      Xcvr 0        REV 01   740-014279   AA0745N1FX8      XFP-OC192-SR
      Xcvr 1        REV 01   740-014279   AA0748N1HN5      XFP-OC192-SR
      Xcvr 2        REV 01   740-014279   AA0748N1HT6      XFP-OC192-SR
      Xcvr 3        REV 01   740-014279   AA0744N1EC9      XFP-OC192-SR
    PIC 1           REV 01   750-010850   JA0329           1x OC-768 SONET SR
    MMB 0           REV 04   710-016036   DE9577           ST-MMB2
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  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
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show chassis hardware (TX Matrix Plus Router)

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user@host> show chassis hardware
sfc0-re0:
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Hardware inventory:
Item             Version  Part number  Serial number    Description
Chassis                                JN113186EAHB     TXP
Midplane         REV 05   710-022574   TS3822           SFC Midplane
FPM Display      REV 03   710-024027   DW4701           TXP FPM Display
CIP 0            REV 05   710-023792   DW7998           TXP CIP
CIP 1            REV 05   710-023792   DW7999           TXP CIP
PEM 0            Rev 04   740-027463   UM26367          Power Entry Module
PEM 1            Rev 04   740-027463   UM26346          Power Entry Module
Routing Engine 0 REV 06   740-026942   737A-1081        RE-DUO-2600
Routing Engine 1 REV 06   740-026942   737A-1043        RE-DUO-2600
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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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lcc0-re0:
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Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11036F8AHA      T1600
Midplane         REV 03   710-017247   RC3799            T-series Backplane
FPM GBUS         REV 10   710-002901   DP7009            T640 FPM Board
FPM Display      REV 01   710-021387   DN7026            T1600 FPM Display
CIP              REV 06   710-002895   DP6024            T-series CIP
PEM 1           Rev 02   740-023211   WA50019          Power Entry Module 4x60A
SCG 0            REV 15   710-003423   DR6757            T640 Sonet Clock Gen.
SCG 1            REV 15   710-003423   DS2225            T640 Sonet Clock Gen.
Routing Engine 0 REV 01   740-026941   737F-1040         RE-DUO-1800
Routing Engine 1 REV 01   740-026941   737F-1016         RE-DUO-1800
CB 0             REV 06   710-022597   DX4011            LCC Control Board
CB 1             REV 06   710-022597   DX4017            LCC Control Board
FPC 1            REV 07   710-013035   DN5847            FPC Type 3-ES
  CPU            REV 08   710-016744   DP2570            ST-PMB2
  PIC 0          REV 05   750-015217   DB0418            8x 1GE(TYPE3), IQ2
    Xcvr 0       REV 01   740-011782   P8Q27ZG           SFP-SX
    Xcvr 1                NON-JNPR     PDA1U0D           SFP-SX
    Xcvr 2       REV 01   740-011613   P9F1ALW           SFP-SX
    Xcvr 3       REV 01   740-011782   PBA403V           SFP-SX
    Xcvr 4                NON-JNPR     PDE09DP           SFP-SX
    Xcvr 5       REV 01   740-011782   PCH2P4K           SFP-SX
    Xcvr 6       REV 01   740-011782   PB94K0F           SFP-SX
    Xcvr 7       REV 01   740-011782   PBA2R2A           SFP-SX
  PIC 1          REV 03   750-004424   HJ4020            1x 10GE(LAN),DWDM
  PIC 2          REV 01   750-003336   HG6073            4x OC-48 SONET, SMSR
  MMB 0          REV 04   710-016036   DP3401            ST-MMB2
FPC 3            REV 12   710-013037   DR1169            FPC Type 4-ES
  CPU            REV 08   710-016744   DP9429            ST-PMB2
  PIC 0          REV 02   750-010850   JA0332            1x OC-768 SONET SR
  MMB 0          REV 04   710-016036   DR0628            ST-MMB2
  MMB 1          REV 04   710-016036   DR0592            ST-MMB2
FPC 4            REV 05   710-021534   DR7350            FPC Type 1-ES
  CPU            REV 08   710-016744   DP8096            ST-PMB2
  PIC 0          REV 04   750-014627   DP9171            4x OC-3 1x OC-12 SFP
    Xcvr 0       REV 02   740-011615   PDE2RVR           SFP-SR
  PIC 1         REV 22   750-005634   DS5815           1x CHOC12 IQ SONET, SMIR

  PIC 2          REV 09   750-002911   CF4539            4x F/E, 100 BASE-TX
  PIC 3          REV 08   750-021652   DR2827            1x CHOC12 IQE SONET
    Xcvr 0                NON-JNPR     8                 UNKNOWN
  MMB 0          REV 04   710-016036   DR0809            ST-MMB2
FPC 5            REV 07   710-007529   HS5608            FPC Type 3
  CPU            REV 15   710-001726   HX4351            FPC CPU
  PIC 0          REV 14   750-009567   WJ8961            1x 10GE(LAN),XENPAK
    Xcvr 0       REV 01   740-013170   J05K05961         XENPAK-LR
  PIC 1          REV 16   750-007141   JJ8146           10x 1GE(LAN), 1000 BASE

    Xcvr 1       REV 01   740-011613   P9F117T           SFP-SX
    Xcvr 2       REV 01   740-011782   PBA2VCL           SFP-SX
    Xcvr 3       REV 01   740-011782   PB83DRB           SFP-SX
    Xcvr 4       REV 01   740-011613   AM0812S8UP8       SFP-SX
  PIC 2          REV 12   750-009567   WF3566            1x 10GE(LAN),XENPAK
    Xcvr 0       REV 02   740-013170   T07C94489         XENPAK-LR
  MMB 0          REV 03   710-005555   HZ1907            MMB-288mbit
  MMB 1          REV 03   710-005555   HW5283            MMB-288mbit
  PPB 0          REV 04   710-002845   HZ7717            PPB Type 3
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  PPB 1          REV 04   710-002845   HS0110            PPB Type 3
FPC 6            REV 07   710-013035   DP7486            FPC Type 3-ES
  CPU            REV 08   710-016744   DP2545            ST-PMB2
  PIC 0          REV 09   750-009567   NE6323            1x 10GE(LAN),XENPAK
    Xcvr 0       REV 02   740-013170   T09C71959         XENPAK-LR
  PIC 1          REV 06   750-015217   DN4775            8x 1GE(TYPE3), IQ2
    Xcvr 0       REV 01   740-011782   P7E0T6M           SFP-SX
    Xcvr 1       REV 01   740-011613   AM0812S8XAY       SFP-SX
    Xcvr 2       REV 01   740-011782   P7E0T6J           SFP-SX
    Xcvr 3       REV 01   740-011782   PCH2P7D           SFP-SX
    Xcvr 4       REV 01   740-011782   P9B0QYT           SFP-SX
    Xcvr 5       REV 01   740-011613   AM0812S8WQJ       SFP-SX
    Xcvr 6       REV 02   740-013111   9301220           SFP-T
    Xcvr 7       REV 01   740-011782   P9B0TZ5           SFP-SX
  PIC 2          REV 06   750-015217   DM6747            8x 1GE(TYPE3), IQ2
    Xcvr 0       REV 01   740-011613   PAP0ZB2           SFP-SX
    Xcvr 1       REV 01   740-013111   70191002          SFP-T
    Xcvr 6       REV 01   740-011782   PBA29H8           SFP-SX
    Xcvr 7       REV 01   740-011613   AM0812S8WQG       SFP-SX
  MMB 0          REV 04   710-016036   DP3238            ST-MMB2
FPC 7            REV 03   710-021540   DV3154            FPC Type 2-ES
  CPU            REV 09   710-016744   DT9053            ST-PMB2
  PIC 0          REV 13   750-001901   HB4225            4x OC-12 SONET, SMIR
  PIC 1          REV 05   750-001900   AD3644            1x OC-48 SONET, SMSR
  PIC 2          REV 10   750-008155   HV0335            2x G/E IQ, 1000 BASE
    Xcvr 0       REV 01   740-011782   PCH2UKF           SFP-SX
    Xcvr 1       REV 01   740-011782   PCH2V19           SFP-SX
  PIC 3          REV 03   750-014638   JS9493            1x OC-48-12-3 SFP
    Xcvr 0       REV 01   740-011785   P6Q0ENK           SFP-SR
  MMB 0          REV 05   710-016036   DP3323            ST-MMB2
SPMB 0           REV 04   710-023321   DX3004            LCC Switch CPU
SPMB 1           REV 04   710-023321   DX3009            LCC Switch CPU
SIB 0            REV 07   710-022594   DW4195            LCC SIB
  B Board        REV 07   710-023185   DW3930            LCC SIB Mezz
SIB 1            REV 07   710-022594   DW4179            LCC SIB
  B Board        REV 07   710-023185   DW3919            LCC SIB Mezz
SIB 2
SIB 3            REV 06   710-022594   DT8251            LCC SIB
  B Board        REV 06   710-023185   DT5792            LCC SIB Mezz
SIB 4            REV 08   710-022594   DW8014            LCC SIB
  B Board        REV 07   710-023185   DW3917            LCC SIB Mezz
Fan Tray 0                                               Front Top Fan Tray
Fan Tray 1                                               Front Bottom Fan Tray
Fan Tray 2                                               Rear Fan Tray -- Rev 3

lcc1-re0:
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Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN1102270AHA      T1600
Midplane         REV 04   710-017247   RC5358            T-series Backplane
FPM GBUS         REV 10   710-002901   DS3443            T640 FPM Board
FPM Display      REV 01   710-021387   DS6411            T1600 FPM Display
CIP              REV 06   710-002895   DS4235            T-series CIP
PEM 0           Rev 02   740-023211   VM82438          Power Entry Module 4x60A
SCG 0            REV 15   710-003423   DS6649            T640 Sonet Clock Gen.
SCG 1            REV 15   710-003423   DR6775            T640 Sonet Clock Gen.
Routing Engine 0 REV 01   740-026941   737F-1083         RE-DUO-1800
Routing Engine 1 REV 01   740-026941   737F-1104         RE-DUO-1800
CB 0             REV 06   710-022597   DW8542            LCC Control Board
CB 1             REV 06   710-022597   DW8530            LCC Control Board
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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   P4T0WLR          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   PDS0MMB          SFP-SR
```



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    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
```

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SIB F13 7          REV 04   750-024564   DW5758           F13 SIB
  B Board          REV 03   710-023431   DW9047           F13 SIB
SIB F13 8          REV 04   750-024564   DW5761           F13 SIB
  B Board          REV 03   710-023431   DW9043           F13 SIB Mezz
SIB F13 9          REV 04   750-024564   DW5754           F13 SIB
  B Board          REV 03   710-023431   DW9078           F13 SIB Mezz
SIB F13 11         REV 04   710-022600   DX0826           F13 SIB
  B Board          REV 03   710-023431   DX0967           F13 SIB Mezz
SIB F13 12         REV 04   750-024564   DW5794           F13 SIB
  B Board          REV 03   710-023431   DW9044           F13 SIB Mezz
SIB F2S 0/0        REV 05   710-022603   DW7897           F2S SIB
  B Board          REV 05   710-023787   DW7657           NEO PMB
SIB F2S 0/2        REV 05   710-022603   DW7833           F2S SIB
  B Board          REV 05   710-023787   DW7526           NEO PMB
SIB F2S 0/4        REV 05   710-022603   DW7875           F2S SIB
  B Board          REV 05   710-023787   DW7588           NEO PMB
SIB F2S 0/6        REV 05   710-022603   DW7860           F2S SIB
  B Board          REV 05   710-023787   DW7589           NEO PMB
SIB F2S 1/0        REV 04   710-022603   DW4820           F2S SIB
  B Board          REV 05   710-023787   DW8510           NEO PMB
SIB F2S 1/2        REV 05   710-022603   DW7849           F2S SIB
  B Board          REV 05   710-023787   DW7525           NEO PMB
SIB F2S 1/4        REV 05   710-022603   DW7927           F2S SIB
  B Board          REV 05   710-023787   DW7556           F2S SIB Mezz
SIB F2S 1/6        REV 05   710-022603   DW7866           F2S SIB
  B Board          REV 05   710-023787   DW7651           NEO PMB
SIB F2S 2/0        REV 05   710-022603   DW7880           F2S SIB
  B Board          REV 05   710-023787   DW7523           NEO PMB
SIB F2S 2/2        REV 05   710-022603   DW7895           F2S SIB
  B Board          REV 05   710-023787   DW7591           NEO PMB
SIB F2S 2/4        REV 05   710-022603   DW7907           F2S SIB
  B Board          REV 05   710-023787   DW7590           NEO PMB
SIB F2S 2/6        REV 05   710-022603   DW7785           F2S SIB
  B Board          REV 05   710-023787   DW7524           NEO PMB
SIB F2S 3/0        REV 05   710-022603   DW7782           F2S SIB
  B Board          REV 05   710-023787   DW7634           NEO PMB
SIB F2S 3/2        REV 05   710-022603   DW7793           F2S SIB
  B Board          REV 05   710-023787   DW7548           NEO PMB
SIB F2S 3/4        REV 05   710-022603   DW7779           F2S SIB
  B Board          REV 05   710-023787   DW7587           NEO PMB
SIB F2S 3/6        REV 05   710-022603   DW7930           F2S SIB
  B Board          REV 05   710-023787   DW7505           NEO PMB
SIB F2S 4/0        REV 05   710-022603   DW7867           F2S SIB
  B Board          REV 05   710-023787   DW7656           NEO PMB
SIB F2S 4/2        REV 05   710-022603   DW7917           F2S SIB
  B Board          REV 05   710-023787   DW7640           NEO PMB
SIB F2S 4/4        REV 05   710-022603   DW7929           F2S SIB
  B Board          REV 05   710-023787   DW7643           NEO PMB
SIB F2S 4/6        REV 05   710-022603   DW7870           F2S SIB
  B Board          REV 05   710-023787   DW7635           NEO PMB
Fan Tray 0         REV 06   760-024497   DV7831           Front Fan Tray
Fan Tray 1         REV 06   760-024497   DV9614           Front Fan Tray
Fan Tray 2         REV 06   760-024502   DV9618           Rear Fan Tray
Fan Tray 3         REV 06   760-024502   DV9616           Rear Fan Tray
Fan Tray 4         REV 06   760-024502   DV7807           Rear Fan Tray
Fan Tray 5         REV 06   760-024502   DV7828           Rear Fan Tray
```

show chassis hardware extensive (TX Matrix Plus Router)

```
user@host> show chassis hardware extensive
sfc0-re0:
--------------------------------------------------------------------------
Hardware inventory:
```



```
Item             Version  Part number  Serial number     Description
Chassis                                JN112F007AHB      TXP
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
                                S/N:               JN112F007AHB
 Assembly ID:  0x052c           Assembly Version:  00.00
 Date:         00-00-0000       Assembly Flags:    0x00
 ID: TXP
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 05 2c 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x20: 4a 4e 31 31 32 46 30 30 37 41 48 42 00 00 00 00
  Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane         REV 05   710-022574   TS4027            SFC Midplane
 Jedec Code:   0x7fb0           EEPROM Version:    0x01
 P/N:          710-022574       S/N:               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:               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:               S/N DW4889
 Assembly ID:  0x0969           Assembly Version:  01.04
 Date:         01-26-2009       Assembly Flags:    0x00
 Version:      REV 04
 ID: TXP CIP                    FRU Model Number:  CIP-TXP
```

```
Board Information Record:
 Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
```

show chassis hardware clei-models (TX Matrix Plus Router)

```
user@host> show chassis hardware clei-models
sfc0-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Midplane         REV 05   710-022574                     CHAS-BP-TXP-S
FPM Display      REV 03   710-024027                     CRAFT-TXP-S
CIP 0            REV 05   710-023792                     CIP-TXP-S
CIP 1            REV 05   710-023792                     CIP-TXP-S
PEM 0            Rev 04   740-027463   IPUPAFGKTA        PWR-TXP-7-60-DC
PEM 1            Rev 04   740-027463   IPUPAFGKTA        PWR-TXP-7-60-DC
Routing Engine 0 REV 06   740-026942                     RE-DUO-C2600-16G-S
Routing Engine 1 REV 06   740-026942                     RE-DUO-C2600-16G-S
CB 0             REV 05   710-022606                     CB-TXP-S
CB 1             REV 09   710-022606                     CB-TXP-S
SIB F13 0        REV 04   750-024564                     SIB-TXP-F13
SIB F13 3        REV 04   750-024564                     SIB-TXP-F13
SIB F13 8        REV 04   750-024564                     SIB-TXP-F13
SIB F13 11       REV 04   750-024564                     SIB-TXP-F13
SIB F13 12       REV 03   750-024564                     SIB-TXP-F13
SIB F2S 0/0      REV 05   710-022603                     SIB-TXP-F2S-S
SIB F2S 0/2      REV 05   710-022603                     SIB-TXP-F2S-S
SIB F2S 0/4      REV 04   710-022603                     SIB-TXP-F2S-S
SIB F2S 0/6      REV 04   710-022603                     SIB-TXP-F2S-S
SIB F2S 1/0      REV 04   710-022603                     SIB-TXP-F2S-S
SIB F2S 1/2      REV 05   710-022603                     SIB-TXP-F2S-S
SIB F2S 1/4      REV 04   710-022603                     SIB-TXP-F2S-S
SIB F2S 1/6      REV 05   710-022603                     SIB-TXP-F2S-S
SIB F2S 2/0      REV 04   710-022603                     SIB-TXP-F2S-S
SIB F2S 2/2      REV 04   710-022603                     SIB-TXP-F2S-S
SIB F2S 2/4      REV 05   710-022603                     SIB-TXP-F2S-S
SIB F2S 2/6      REV 04   710-022603                     SIB-TXP-F2S-S
SIB F2S 3/0      REV 05   710-022603                     SIB-TXP-F2S-S
SIB F2S 3/2      REV 03   710-022603                     SIB-TXP-F2S-S
SIB F2S 3/4      REV 05   710-022603                     SIB-TXP-F2S-S
SIB F2S 3/6      REV 03   710-022603                     SIB-TXP-F2S-S
SIB F2S 4/0      REV 03   710-022603                     SIB-TXP-F2S-S
SIB F2S 4/2      REV 05   710-022603                     SIB-TXP-F2S-S
SIB F2S 4/4      REV 04   710-022603                     SIB-TXP-F2S-S
SIB F2S 4/6      REV 03   710-022603                     SIB-TXP-F2S-S
Fan Tray 0       REV 02   760-024497                     FANTRAY-TXP-H-S
Fan Tray 1       REV 02   760-024497                     FANTRAY-TXP-H-S
Fan Tray 2       REV 05   760-024502                     FANTRAY-TXP-V-S
Fan Tray 3
Fan Tray 4       REV 05   760-024502                     FANTRAY-TXP-V-S
Fan Tray 5       REV 02   760-024502                     FANTRAY-TXP-V-S

lcc0-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Midplane         REV 03   710-017247                     CHAS-BP-T1600-S
FPM Display      REV 01   710-021387                     CRAFT-T1600-S
CIP              REV 06   710-002895                     CIP-L-T640-S
PEM 1            Rev 02   740-023211   IPUPAC8KTA        PWR-T1600-4-60-DC-S
SCG 0            REV 15   710-003423                     SCG-T-S
SCG 1            REV 15   710-003423                     SCG-T-S
Routing Engine 0 REV 01   740-026941                     RE-DUO-C1800-8G-S
```



```
Routing Engine 1 REV 01   740-026941                     RE-DUO-C1800-8G-S
CB 0             REV 06   710-022597                     CB-LCC-S
CB 1             REV 06   710-022597                     CB-LCC-S
FPC 1            REV 07   710-013035                     T640-FPC3-ES
  PIC 0          REV 05   750-015217                     PC-8GE-TYPE3-SFP-IQ2
  PIC 1          REV 03   750-004424                     PC-1XGE-LR
  PIC 2          REV 01   750-003336                     PC-4OC48-SON-SMSR
FPC 3            REV 12   710-013037                     T1600-FPC4-ES
  PIC 0          REV 02   750-010850                     PD-1OC768-SON-SR
FPC 4            REV 05   710-021534                     T640-FPC1-ES
  PIC 0          REV 04   750-014627                     PB-4OC3-1OC12-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-4OC12-SON-SMIR
  PIC 1          REV 05   750-001900                     PB-1OC48-SON-SMSR
  PIC 2          REV 10   750-008155                     PB-2GE-SFP-QPP
  PIC 3          REV 03   750-014638                     PB-1OC48-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)

```
user@host> show chassis hardware detail
sfc0-re0:
--------------------------------------------------------------------------
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
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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:
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Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN1101F27AHA      T1600
Midplane         REV 04   710-017247   RC5317            T Series Backplane
FPM GBUS         REV 10   710-002901   DS8197            T640 FPM Board
FPM Display      REV 01   710-021387   DS6433            T1600 FPM Display
CIP              REV 06   710-002895   DS1493            T Series CIP
PEM 0            Rev 08   740-017906   UD26601           Power Entry Module 3x80
SCG 0            REV 15   710-003423   DP5847            T640 Sonet Clock Gen.
SCG 1            REV 15   710-003423   DR0924            T640 Sonet Clock Gen.
Routing Engine 0 REV 01   740-026942   737F-1024         LCC RE
  ad0    3887 MB  SMART CF             2008110502B63E513E51 Compact Flash
  ad1   30533 MB  SAMSUNG MCBQE32G8MPP-0V SY814A1208     Disk 1
Routing Engine 1 REV 01   740-026942   737F-1024         LCC RE
  ad0    3887 MB  SMART CF             2008110500F9A8A8A8A8 Compact Flash
  ad1   30533 MB  SAMSUNG MCBQE32G8MPP-0V SY814A1076     Disk 1
CB 0             REV 05   710-022597   DV4264            LCC Control Board
CB 1             REV 03   710-022597   DP8558            LCC Control Board
FPC 0            REV 14   710-013037   DS9967            FPC Type 4-ES
  CPU            REV 08   710-016744   DS3989            ST-PMB2
  PIC 0          REV 12   750-013198   DL7506            1x Tunnel
  PIC 1          REV 12   750-013198   DL7505            1x Tunnel
  MMB 0          REV 01   710-025563   DS8524            ST-MMB2
  MMB 1          REV 01   710-025563   DS8373            ST-MMB2
FPC 1            REV 14   710-013037   DT0027            FPC Type 4-ES
  CPU            REV 09   710-016744   DS7684            ST-PMB2
  PIC 0          REV 12   750-013198   DL7512            1x Tunnel
  PIC 1          REV 12   750-013198   DL7498            1x Tunnel
  MMB 0          REV 01   710-025563   DS8494            ST-MMB2
  MMB 1          REV 01   710-025563   DS8436            ST-MMB2
SPMB 0           REV 04   710-023321   DV3867            LCC Switch CPU
SPMB 1           REV 02   710-023321   DP0238            LCC Switch CPU
SIB 0            REV 06   710-022594   DT8268            LCC SIB
  B Board        REV 06   710-023185   DT5791            LCC SIB Mezz
SIB 1            REV 06   710-022594   DT8261            LCC SIB
  B Board        REV 06   710-023185   DT5769            LCC SIB Mezz
SIB 2            REV 04   710-022594   DS2315            LCC SIB
  B Board        REV 06   710-023185   DT5788            LCC SIB Mezz
SIB 3            REV 06   710-022594   DT8253            LCC SIB
  B Board        REV 06   710-023185   DT5811            LCC SIB Mezz
SIB 4            REV 06   710-022594   DT8248            LCC SIB
  B Board        REV 06   710-023185   DT5812            LCC SIB Mezz
Fan Tray 0                                               Front Top Fan Tray
Fan Tray 1                                               Front Bottom Fan Tray
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Fan Tray 2                                                 Rear Fan Tray
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show chassis hardware models (TX Matrix Plus Router)

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user@host> show chassis hardware models
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           ÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿÿ
Routing Engine 0 REV 01   740-026942   737A-1064         RE-TXP-SFC-DUO-2600-16G
Routing Engine 1 REV 01   740-026942   737A-1082         RE-TXP-SFC-DUO-2600-16G
CB 0                REV 09   710-022606   DW6099            CB-TXP
CB 1                REV 09   710-022606   DW6096            CB-TXP
SIB F13 1           REV 04   750-024564   DW5776            SIB-TXP-F13
SIB F13 3           REV 04   750-024564   DW5762            SIB-TXP-F13
SIB F13 4           REV 04   750-024564   DW5797            SIB-TXP-F13
SIB F13 6           REV 04   750-024564   DW5770            SIB-TXP-F13
SIB F13 7           REV 04   750-024564   DW5758            SIB-TXP-F13
SIB F13 8           REV 04   750-024564   DW5761            SIB-TXP-F13
SIB F13 9           REV 04   750-024564   DW5754            SIB-TXP-F13
SIB F13 12          REV 04   750-024564   DW5794            SIB-TXP-F13
SIB F2S 0/0         REV 05   710-022603   DW7897
SIB F2S 0/2         REV 05   710-022603   DW7833
SIB F2S 0/4         REV 05   710-022603   DW7875
SIB F2S 0/6         REV 05   710-022603   DW7860
SIB F2S 1/0         REV 04   710-022603   DW4820
SIB F2S 1/2         REV 05   710-022603   DW7849
SIB F2S 1/4         REV 05   710-022603   DW7927            SIB-TXP-F2S
SIB F2S 1/6         REV 05   710-022603   DW7866
SIB F2S 2/0         REV 05   710-022603   DW7880
SIB F2S 2/2         REV 05   710-022603   DW7895
SIB F2S 2/4         REV 05   710-022603   DW7907
SIB F2S 2/6         REV 05   710-022603   DW7785
SIB F2S 3/0         REV 05   710-022603   DW7782
SIB F2S 3/2         REV 05   710-022603   DW7793
SIB F2S 3/4         REV 05   710-022603   DW7779
SIB F2S 3/6         REV 05   710-022603   DW7930
SIB F2S 4/0         REV 05   710-022603   DW7867
SIB F2S 4/2         REV 05   710-022603   DW7917
SIB F2S 4/4         REV 05   710-022603   DW7929
SIB F2S 4/6         REV 05   710-022603   DW7870
Fan Tray 0          REV 06   760-024497   DV7831            FANTRAY-TXP-F
Fan Tray 1          REV 06   760-024497   DV9614            FANTRAY-TXP-F
Fan Tray 2          REV 06   760-024502   DV9618            FANTRAY-TXP-R
Fan Tray 3          REV 06   760-024502   DV9616            FANTRAY-TXP-R
Fan Tray 4          REV 06   760-024502   DV7807            FANTRAY-TXP-R
Fan Tray 5          REV 06   760-024502   DV7828            FANTRAY-TXP-R

lcc0-re0:
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Hardware inventory:
Item                Version  Part number  Serial number     FRU model number
Midplane            REV 03   710-017247   RC3765            CHAS-BP-T1600-S
FPM Display         REV 01   710-021387   DN5441            CRAFT-T1600-S
CIP                 REV 06   710-002895   DP6021            CIP-L-T640-S
PEM 0               Rev 07   740-017906   UA26384           PWR-T1600-3-80-DC-S
PEM 1               Rev 07   740-017906   UA26296           PWR-T1600-3-80-DC-S
SCG 0               REV 15   710-003423   DR0875            SCG-T-S
CB 0                REV 06   710-022597   DW8534            CB-LCC
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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:
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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:
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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
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  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-4OC192-SON-XFP
  PIC 1           REV 11   750-017405   DP8776           PD-4XGE-XFP
FPC 7             REV 04   710-013560   JR3968           T640-FPC3-E2
  PIC 0           REV 16   750-007141   NC9330           PC-10GE-SFP
SIB 0             REV 07   710-022594   DW4217           SIB-TXP-T1600-S
SIB 1             REV 07   710-022594   DW4213           SIB-TXP-T1600-S
SIB 2             REV 07   710-022594   DW4189           SIB-TXP-T1600-S
SIB 3             REV 07   710-022594   DW4173           SIB-TXP-T1600-S
SIB 4             REV 07   710-022594   DW4201           SIB-TXP-T1600-S
Fan Tray 0                                               FANTRAY-T-S
Fan Tray 1                                               FANTRAY-T-S
Fan Tray 2                                               FANTRAY-TXP-R-S

lcc3-re0:
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Hardware inventory:
Item              Version  Part number  Serial number    FRU model number
Midplane          REV 04   710-017247   RC5319           CHAS-BP-T1600-S
FPM Display       REV 01   710-021387   DS6402           CRAFT-T1600-S
CIP               REV 06   710-002895   DR9973           CIP-L-T640-S
PEM 0             Rev 07   740-017906   UC26496          PWR-T1600-3-80-DC-S
PEM 1             Rev 07   740-017906   UC26599          PWR-T1600-3-80-DC-S
SCG 0             REV 15   710-003423   DP5831           SCG-T-S
CB 0              REV 06   710-022597   DW8533           CB-LCC
CB 1              REV 06   710-022597   DW8538           CB-LCC
FPC 0             REV 14   710-013037   DS5345           T1600-FPC4-ES
  PIC 0           REV 13   750-017405   DS7641           PD-4XGE-XFP
  PIC 1           REV 13   750-017405   DS5479           PD-4XGE-XFP
FPC 1             REV 14   710-013037   DS7338           T1600-FPC4-ES
  PIC 0           REV 13   750-017405   DS7631           PD-4XGE-XFP
  PIC 1           REV 13   750-017405   DS7632           PD-4XGE-XFP
FPC 2             REV 14   710-013037   DS9962           T1600-FPC4-ES
  PIC 0           REV 13   750-017405   DS7581           PD-4XGE-XFP
  PIC 1           REV 13   750-017405   DS7627           PD-4XGE-XFP
FPC 4             REV 10   710-010845   JZ6573           T640-FPC4-ES
  PIC 0           REV 14   750-012518   JT5124           PD-4OC192-SON-XFP
FPC 5             REV 14   710-013037   DT0016           T1600-FPC4-ES
  PIC 0           REV 14   750-012518   JY9918           PD-4OC192-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 (16-Port 10-Gigabit Ethernet MPC with

```
user@host> show chassis hardware
Hardware inventory:
    Item              Version  Part number  Serial number    Description
    Chassis                                 JN112D865AFA     MX960
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SFP+ Optics [MX Series Routers])

```
    Midplane         REV 03   710-013698   TS3339          MX960 Backplane
    FPM Board        REV 03   710-014974   WW6267          Front Panel Display

    PDM              Rev 03   740-013110   QCS12485026     Power Distribution
Module
    PEM 0            Rev 04   740-013682   QCS12434086     PS 1.7kW; 200-240VAC
 in
    PEM 1            Rev 04   740-013682   QCS1243408Z     PS 1.7kW; 200-240VAC
 in
    PEM 2            Rev 04   740-013682   QCS1243407X     PS 1.7kW; 200-240VAC
 in
    Routing Engine 0 REV 07   740-015113   9009009677      RE-S-1300
    Routing Engine 1 REV 07   740-015113   9009011510      RE-S-1300
    CB 0             REV 03   710-021523   XF0394          MX SCB
    CB 1             REV 03   710-021523   XF0550          MX SCB
    CB 2             REV 03   710-021523   XD7455          MX SCB
    FPC 4            REV 02   750-028467   JR6127          MPC M 16x 10GE
      CPU            REV 02   711-029089   JX0129          AS PMB
      PIC 0                   BUILTIN      BUILTIN         4x 10GE(LAN) SFP+
      PIC 1                   BUILTIN      BUILTIN         4x 10GE(LAN) SFP+
      PIC 2                   BUILTIN      BUILTIN         4x 10GE(LAN) SFP+
      PIC 3                   BUILTIN      BUILTIN         4x 10GE(LAN) SFP+
    Fan Tray 0       REV 05   740-014971   TP9990          Fan Tray
    Fan Tray 1       REV 05   740-014971   VS1709          Fan Tray
```

show chassis hardware (MPC3E [MX Series Routers])

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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          MPCE Type 3D
    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         MPCE Type 3D
    CPU             REV 03   711-035209   YL6931          HMPC PMB 2G
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    MIC 0           REV 05    750-033199    YR3269            1X100GE CFP
      PIC 0                   BUILTIN       BUILTIN           1X100GE CFP
        Xcvr 0      REV 01    740-032210    ULHOKG3           CFP-100G-LR4
    MIC 1           REV 02    750-033199    YG3245            1X100GE CFP
      PIC 2                   BUILTIN       BUILTIN           1X100GE CFP
        Xcvr 0      REV 01    740-032210    ULHOKGF           CFP-100G-LR4
  FPC 4             REV 12.3.09 750-033205 YR9437             MPCE Type 3D
   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          BUILTIN      BUILTIN           QFX Routing Engine
FPC 0            REV 04   750-044071   BBAR3902          QFX3500-48S4Q-AFI
  CPU                     BUILTIN      BUILTIN           FPC CPU
  PIC 0                   BUILTIN      BUILTIN           48x 10G-SFP+
  PIC 1                   BUILTIN      BUILTIN           15x 10G-SFP+
  MGMT BRD       REV 02   750-044063   BBAR0398          QFX3500-MGMT-SFP-AFO
    Xcvr 0       REV 01   740-011614   AC0946S0BD1       SFP-LX10
    Xcvr 1       REV 02   740-013111   A281922           SFP-T
Power Supply 0   Rev 04   740-032091   UI00677           JPSU-650W-AC-AFI
Power Supply 1   REV 00   740-041741   VJ00162           JPSU-650W-AC-AFO
Fan Tray 0                                               QFX Fan Tray, Back to
Front Airlfow
Fan Tray 1                                               QFX Fan Tray, Back to
Front Airlfow
Fan Tray 2                                               QFX Fan Tray, Back to
Front Airlfow
```

show chassis hardware detail (QFX3500 Switches)

```
user@switch> show chassis hardware detail
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN000TEST5        QFX3500
Routing Engine 0          BUILTIN      BUILTIN           QFX Routing Engine
```



```
FPC 0           REV 05   750-036931   EE0823           QFX3500-48S4Q-AFI


  CPU                    BUILTIN      BUILTIN          FPC CPU
  PIC 0                  BUILTIN      BUILTIN          48x 10G-SFP+
    Xcvr 0      REV 01   740-030589   S99E270079       SFP+-10G-LPBK
    Xcvr 1      REV 01   740-030589   S9AK450099       SFP+-10G-LPBK
    Xcvr 2      REV 01   740-030589   S99E270078       SFP+-10G-LPBK
    Xcvr 3      REV 01   740-030589   S9AK450098       SFP+-10G-LPBK
    Xcvr 4      REV 01   740-030589   S99E270075       SFP+-10G-LPBK
    Xcvr 5      REV 01   740-030589   S9AK450093       SFP+-10G-LPBK
    Xcvr 6      REV 01   740-030589   S9AK450097       SFP+-10G-LPBK
    Xcvr 7      REV 01   740-030589   S9AK450095       SFP+-10G-LPBK
    Xcvr 8      REV 01   740-030589   S99E270072       SFP+-10G-LPBK
    Xcvr 9      REV 01   740-030589   S99E270073       SFP+-10G-LPBK
    Xcvr 10     REV 01   740-030589   S99E270080       SFP+-10G-LPBK
    Xcvr 11     REV 01   740-030589   S9AK450169       SFP+-10G-LPBK
    Xcvr 12     REV 01   740-030589   S99E270076       SFP+-10G-LPBK
    Xcvr 13     REV 01   740-030589   S9AK450167       SFP+-10G-LPBK
    Xcvr 14     REV 01   740-030589   S9AK450170       SFP+-10G-LPBK
    Xcvr 15     REV 01   740-030589   S9AK450166       SFP+-10G-LPBK
    Xcvr 16     REV 01   740-030589   S9AK450092       SFP+-10G-LPBK
    Xcvr 17     REV 01   740-030589   S9AK450163       SFP+-10G-LPBK
    Xcvr 18     REV 01   740-030589   S9AK450094       SFP+-10G-LPBK
    Xcvr 19     REV 01   740-030589   S9AK450100       SFP+-10G-LPBK
    Xcvr 20     REV 01   740-030589   S9AK450168       SFP+-10G-LPBK
    Xcvr 21     REV 01   740-030589   S9AK450165       SFP+-10G-LPBK
    Xcvr 22     REV 01   740-030589   S9AK450073       SFP+-10G-LPBK
    Xcvr 23     REV 01   740-030589   S9AK450164       SFP+-10G-LPBK
    Xcvr 24     REV 01   740-030589   S9AK450074       SFP+-10G-LPBK
    Xcvr 25     REV 01   740-030589   SA62270195       SFP+-10G-LPBK
    Xcvr 26     REV 01   740-030589   S9AK450078       SFP+-10G-LPBK
    Xcvr 27     REV 01   740-030589   S9AK450024       SFP+-10G-LPBK
    Xcvr 28     REV 01   740-030589   S9AK450027       SFP+-10G-LPBK
    Xcvr 29     REV 01   740-030589   S9AK450080       SFP+-10G-LPBK
    Xcvr 30     REV 01   740-030589   S9AK450030       SFP+-10G-LPBK
    Xcvr 31     REV 01   740-030589   S9AK450025       SFP+-10G-LPBK
    Xcvr 32     REV 01   740-030589   S9AK450023       SFP+-10G-LPBK
    Xcvr 33     REV 01   740-030589   S9AK450075       SFP+-10G-LPBK
    Xcvr 34     REV 01   740-030589   S9AK450161       SFP+-10G-LPBK
    Xcvr 35     REV 01   740-030589   S9AK450071       SFP+-10G-LPBK
    Xcvr 36     REV 01   740-030589   S9AK450072       SFP+-10G-LPBK
    Xcvr 37     REV 01   740-030589   S9AK450022       SFP+-10G-LPBK
    Xcvr 38     REV 01   740-030589   S9AK450021       SFP+-10G-LPBK
    Xcvr 39     REV 01   740-030589   S9AK450175       SFP+-10G-LPBK
    Xcvr 40     REV 01   740-030589   S9AK450162       SFP+-10G-LPBK
    Xcvr 41     REV 01   740-030589   S99E270074       SFP+-10G-LPBK
    Xcvr 42     REV 01   740-030589   S9AK450174       SFP+-10G-LPBK
    Xcvr 43     REV 01   740-030589   S9AK450077       SFP+-10G-LPBK
    Xcvr 44     REV 01   740-030589   S9AK450076       SFP+-10G-LPBK
    Xcvr 45     REV 01   740-030589   S9AK450026       SFP+-10G-LPBK
    Xcvr 46     REV 01   740-030589   S9AK450079       SFP+-10G-LPBK
    Xcvr 47     REV 01   740-030589   S9AK450029       SFP+-10G-LPBK
  PIC 1                  BUILTIN      BUILTIN          15x 10G-SFP+
    Xcvr 1      REV 01   740-032986   QA170087         QSFP+-40G-SR4
    Xcvr 4      REV 01   740-032986   QA360442         QSFP+-40G-SR4
    Xcvr 8      REV 01   740-032986   QA170091         QSFP+-40G-SR4
    Xcvr 12     REV 01   740-032986   QA170042         QSFP+-40G-SR4
MGMT BRD      REV 08   750-036946   EE0731           QFX3500-MB
Power Supply 0   Rev 04   740-032091   UI00690          QFX PS 650W AC
Power Supply 1   Rev 04   740-032091   UI00679          QFX PS 650W AC
```

```
Fan Tray 0                                              QFX Fan Tray
Fan Tray 1                                              QFX Fan Tray
```

show chassis hardware models (QFX3500 Switches)

```
user@switch> show chassis hardware models
Hardware inventory:
Item             Version  Part number  Serial number     FRU model number
Routing Engine 0          BUILTIN      BUILTIN
FPC 0            REV 02   711-032234   EC4074
Power Supply 0   PSMI 2C  11-d65800    --
```

show chassis hardware clei-models (QFX3500 Switches)

```
user@switch> show chassis hardware clei-models
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Routing Engine 0          BUILTIN
FPC 0            REV 02   711-032234
Power Supply 0   PSMI 2C  11-d65800
```

show chassis hardware interconnect-device (QFabric Systems)

```
user@switch> show chassis hardware interconnect-device interconnect1
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis          REV 07                                  QFX_olive
Midplane         REV 07   750-021261   BH0208188289      QFX Midplane
CB 0             REV 07   750-021261   BH0208188289      QFXIC08-CB4S
```

show chassis hardware node-device (QFabric Systems)

```
user@switch> show chassis hardware node-device node1
Routing Engine 0   BUILTIN      BUILTIN           QFX Routing Engine
node1            REV 05   711-032234   ED3694            QFX3500-48S4Q-AFI


  CPU                     BUILTIN      BUILTIN           FPC CPU
  PIC 0                   BUILTIN      BUILTIN           48x 10G-SFP+
    Xcvr 8       REV 01   740-030658   AD0946A028B       SFP+-10G-USR
...
```

show chassis hardware (PTX5000 Packet Transport Switch)

```
user@switch> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11D1FD7AJA      PTX5000
Midplane         REV 03   711-031896   ABAC5589          Midplane-8S
FPM              REV 08   760-030647   EG1679            Front Panel Display
PDU 0            Rev 05   740-032019   ZE00006           DC Power Dist Unit
  PSM 0          Rev 05   740-032022   ZJ00018           DC 12V Power Supply
  PSM 1          Rev 04   740-032022   ZC00052           DC 12V Power Supply
  PSM 2          Rev 04   740-032022   ZD00051           DC 12V Power Supply
  PSM 3          Rev 05   740-032022   ZJ00060           DC 12V Power Supply
CCG 0            REV 04   750-030653   EG3703            Clock Generator
CCG 1            REV 04   750-030653   EG3698            Clock Generator
Routing Engine 0 REV 05   740-026942   P737A-002231      RE-DUO-2600
Routing Engine 1 REV 06   740-026942   P737A-002438      RE-DUO-2600
CB 0             REV 08   750-030625   EG5519            Control Board
CB 1             REV 08   750-030625   EG5516            Control Board
FPC 0            REV 18   750-036844   EJ3080            FPC
  CPU            REV 12   711-030686   EJ3260            SNG PMB
FPC 2            REV 13   750-036844   EG5065            FPC
  CPU            REV 09   711-030686   EG4082            SNG PMB
  PIC 0          REV 14   750-031913   EG5127            24x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   143363A00240      SFP+-10G-SR
```



```
    Xcvr 1       REV 01   740-031981   UK90PZ1          SFP+-10G-LR
    Xcvr 2       REV 01   740-031980   AD1141A04XH      SFP+-10G-SR
    Xcvr 3       REV 01   740-031981   UK90Q46          SFP+-10G-LR
    Xcvr 4       REV 01   740-031980   AD1141A04X4      SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   B11H02560        SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   B11C01589        SFP+-10G-SR
    Xcvr 8       REV 01   740-031980   AD1141A04XF      SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   123363A01094     SFP+-10G-SR
    Xcvr 11      REV 01   740-031980   AK80LKF          SFP+-10G-SR
    Xcvr 12      REV 01   740-031980   183363A01528     SFP+-10G-SR
    Xcvr 14      REV 01   740-031980   193363A01079     SFP+-10G-SR
    Xcvr 15      REV 01   740-031980   AK80MC8          SFP+-10G-SR
    Xcvr 16      REV 01   740-031980   AJC0BHC          SFP+-10G-SR
    Xcvr 19      REV 01   740-021309   J08D26856        SFP+-10G-LR
    Xcvr 21      REV 01   740-031980   AK80KCT          SFP+-10G-SR
    Xcvr 22      REV 01   740-031981   UK90PZL          SFP+-10G-LR
    Xcvr 23      REV 01   740-031980   AK80N1V          SFP+-10G-SR
FPC 3            REV 13   750-036844   EG5074           FPC
  CPU            REV 09   711-030686   EG4064           SNG PMB
  PIC 1          REV 10   750-031903   EG0325           SNG Load
FPC 5            REV 06   750-036844   EH3198           FPC
  CPU
  PIC 0          REV 14   750-031913   EG5134           24x 10GE(LAN) SFP+
    Xcvr 0       REV 01   740-031980   AK80LBH          SFP+-10G-SR
    Xcvr 1       REV 01   740-031980   B11B03724        SFP+-10G-SR
    Xcvr 2       REV 01   740-031980   AK80FMH          SFP+-10G-SR
    Xcvr 5       REV 01   740-031980   B11J00818        SFP+-10G-SR
    Xcvr 6       REV 01   740-031980   193363A00743     SFP+-10G-SR
    Xcvr 7       REV 01   740-031980   B11B06125        SFP+-10G-SR
    Xcvr 10      REV 01   740-031980   B11H02529        SFP+-10G-SR
    Xcvr 11      REV 01   740-031980   AK80LFB          SFP+-10G-SR
    Xcvr 12      REV 01   740-031980   193363A01061     SFP+-10G-SR
    Xcvr 15      REV 01   740-031980   B11J00687        SFP+-10G-SR
    Xcvr 16      REV 01   740-031980   193363A00738     SFP+-10G-SR
    Xcvr 18      REV 01   740-031980   AK80MQX          SFP+-10G-SR
    Xcvr 19      REV 01   740-021309   J08C17257        SFP+-10G-LR
    Xcvr 22      REV 01   740-031980   B11J00730        SFP+-10G-SR
    Xcvr 23      REV 01   740-031980   AK80KEE          SFP+-10G-SR
  PIC 1          REV 08   750-036710   EG3105           2x 40GE CFP
    Xcvr 0       REV 01   740-034554   B260HLT          CFP-40G-LR4
    Xcvr 1       REV 01   740-034554   B11C02847        CFP-40G-LR4
FPC 6            REV 18   750-036844   EJ4391           FPC
  CPU            REV 12   711-030686   EJ3257           SNG PMB
FPC 7            REV 18   750-036844   EJ4382           FPC
  CPU            REV 12   711-030686   EJ3238           SNG PMB
SPMB 0           REV 10   711-030686   EG5418           SNG PMB
SPMB 1           REV 09   711-030686   EG5373           SNG PMB
SIB 0            REV 07   750-030631   EG4858           SIB-I-8S
SIB 1            REV 07   750-030631   EG4872           SIB-I-8S
SIB 2            REV 07   750-030631   EG4866           SIB-I-8S
SIB 3            REV 07   750-030631   EG6011           SIB-I-8S
SIB 4            REV 07   750-030631   EG4907           SIB-I-8S
SIB 5            REV 07   750-030631   EG4879           SIB-I-8S
SIB 6            REV 07   750-030631   EG4864           SIB-I-8S
SIB 7            REV 07   750-030631   EG4899           SIB-I-8S
SIB 8            REV 07   750-030631   EG4880           SIB-I-8S
Fan Tray 0       REV 04   760-032784   EG1496           Vertical Fan Tray
Fan Tray 1       REV 04   760-030642   EG1335           Horizontal Fan Tray
Fan Tray 2       REV 02   760-030642   ED4952           Horizontal Fan Tray
```

`user@switch>` **show chassis hardware clei-models**

show chassis hardware clei-models (PTX5000 Packet Transport Switch)

```
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 detail (PTX5000

```
user@switch> show chassis hardware detail
Hardware inventory:
Item             Version  Part number  Serial number     Description
```

Packet Transport Switch)

```
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 models (PTX5000 Packet Transport Switch)

```
user@switch> show chassis hardware models
Hardware inventory:
Item               Version  Part number  Serial number   FRU model number
FPM                REV 08   760-030647   EG1679          CRAFT-PTX5000-S
PDU 0              Rev 05   740-032019   ZE00006         PWR-SAN-PDU-DC
  PSM 0            Rev 05   740-032022   ZJ00018         PSM-PTX-DC-120-S
  PSM 1            Rev 04   740-032022   ZC00052         PWR-SAN-12-DC
  PSM 2            Rev 04   740-032022   ZD00051         PWR-SAN-12-DC
  PSM 3            Rev 05   740-032022   ZJ00060         PSM-PTX-DC-120-S
CCG 0              REV 04   750-030653   EG3703          CCG-PTX-S
CCG 1              REV 04   750-030653   EG3698          CCG-PTX-S
Routing Engine 0 REV 05     740-026942   P737A-002231    RE-DUO-C2600-16G-S
Routing Engine 1 REV 06     740-026942   P737A-002438    RE-DUO-C2600-16G-S
CB 0               REV 08   750-030625   EG5519          CB-PTX-S
CB 1               REV 08   750-030625   EG5516          CB-PTX-S
FPC 0              REV 18   750-036844   EJ3080          FPC-PTX-P1-A
FPC 2              REV 13   750-036844   EG5065          FPC-PTX-P1-A
  PIC 0            REV 14   750-031913   EG5127          P1-PTX-24-10GE-SFPP
FPC 3              REV 13   750-036844   EG5074          FPC-PTX-P1-A
FPC 5
  PIC 0            REV 14   750-031913   EG5134          P1-PTX-24-10GE-SFPP
FPC 6              REV 18   750-036844   EJ4391          FPC-PTX-P1-A
FPC 7              REV 18   750-036844   EJ4382          FPC-PTX-P1-A
SIB 0              REV 07   750-030631   EG4858          SIB-I-PTX5008
SIB 1              REV 07   750-030631   EG4872          SIB-I-PTX5008
SIB 2              REV 07   750-030631   EG4866          SIB-I-PTX5008
SIB 3              REV 07   750-030631   EG6011          SIB-I-PTX5008
SIB 4              REV 07   750-030631   EG4907          SIB-I-PTX5008
SIB 5              REV 07   750-030631   EG4879          SIB-I-PTX5008
SIB 6              REV 07   750-030631   EG4864          SIB-I-PTX5008
SIB 7              REV 07   750-030631   EG4899          SIB-I-PTX5008
SIB 8              REV 07   750-030631   EG4880          SIB-I-PTX5008
Fan Tray 1         REV 04   760-030642   EG1335          FAN-PTX-H-S
```

show chassis hardware extensive (PTX5000

```
user@switch> show chassis hardware extensive
Hardware inventory:
Item               Version  Part number  Serial number   Description
```

Packet Transport Switch)

```
...............
PDU 0            Rev 04   740-032019   UE0003          DC Power Dist Unit
 Jedec Code:    0x7fb0           EEPROM Version:    0x02
 P/N:           740-032019       S/N:               S/N UE0003
 Assembly ID:   0x043d           Assembly Version:  04.00
 Date:          11-29-2010       Assembly Flags:    0x00
 Version:       Rev 04           CLEI Code:         032022XXXX
 ID: DC Power Dist Unit          FRU Model Number:  PWR-SAN-PDU-DC
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 3d 04 00 52 65 76 20 30 34 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 33 32 30 31 39 00 00
  Address 0x20: 53 2f 4e 20 55 45 30 30 30 33 00 00 00 1d 0b 07
  Address 0x30: da ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 30 33 32 30 32 32 58 58 58 58 50
  Address 0x50: 57 52 2d 53 41 4e 2d 50 44 55 2d 44 43 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 a3 ff ff ff ff ff ff ff ff ff ff ff ff
  PSM 0          Rev 04   740-032022   YG00065         DC 12V Power Supply
Module
 Jedec Code:    0x7fb0           EEPROM Version:    0x02
 P/N:           740-032022       S/N:               S/N YG00065
 Assembly ID:   0x0440           Assembly Version:  04.00
 Date:          07-30-2010       Assembly Flags:    0x00
 Version:       Rev 04           CLEI Code:         032022XXXX
 ID: DC 12V Power Supply Module  FRU Model Number:  PWR-SAN-12-DC
 Board Information Record:
  Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 04 40 04 00 52 65 76 20 30 34 00 00
  Address 0x10: 00 00 00 00 37 34 30 2d 30 33 32 30 32 32 00 00
  Address 0x20: 53 2f 4e 20 59 47 30 30 30 36 35 00 00 1e 07 07
  Address 0x30: da ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
  Address 0x40: ff ff ff ff 01 30 33 32 30 32 32 58 58 58 58 50
  Address 0x50: 57 52 2d 53 41 4e 2d 31 32 2d 44 43 20 20 20 20
  Address 0x60: 20 20 20 20 20 20 01 00 ff ff ff ff ff ff ff ff
  Address 0x70: ff ff ff 0c ff ff ff ff ff ff ff ff ff ff ff ff
```

show chassis hardware (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

```
user@switch> show chassis hardware extensive
FPC 1            REV 11   750-037207   ZW9726            AS-MCC
 Jedec Code:    0x7fb0           EEPROM Version:    0x02
```

with Media Services Blade [MSB])

```
P/N:           750-037207        S/N:              S/N ZW9726
Assembly ID:   0x0b37            Assembly Version:  01.11
Date:          02-17-2012        Assembly Flags:    0x00
Version:       REV 11            CLEI Code:         PROTOXCLEI
ID: AS-MCC         FRU Model Number:  750-037207
Board Information Record:
 Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
 Address 0x00: 7f b0 02 ff 0b 37 01 0b 52 45 56 20 31 31 00 00
 Address 0x10: 00 00 00 00 37 35 30 2d 30 33 37 32 30 37 00 00
 Address 0x20: 53 2f 4e 20 5a 57 39 37 32 36 00 00 00 11 02 07
 Address 0x30: dc ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x40: ff ff ff ff 01 50 52 4f 54 4f 58 43 4c 45 49 37
 Address 0x50: 35 30 2d 30 33 37 32 30 37 00 00 00 00 00 00 00
 Address 0x60: 00 00 00 00 00 00 31 31 00 ff ff ff ff ff ff ff
 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:               S/N ZW4819
Assembly ID:   0x0b38            Assembly Version:  01.04
Date:          12-30-2011        Assembly Flags:    0x00
Version:       REV 04
ID: AS-MCC PMB
Board Information Record:
 Address 0x00: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
I2C Hex Data:
 Address 0x00: 7f b0 02 ff 0b 38 01 04 52 45 56 20 30 34 00 00
 Address 0x10: 00 00 00 00 37 31 31 2d 30 33 38 31 37 33 00 00
 Address 0x20: 53 2f 4e 20 5a 57 34 38 31 39 00 00 00 1e 0c 07
 Address 0x30: db ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
 Address 0x40: ff ff ff ff 00 50 52 4f 54 4f 58 43 4c 45 49 37
 Address 0x50: 31 31 2d 30 33 38 31 37 33 00 00 00 00 00 00 00
 Address 0x60: 00 00 00 00 00 00 30 34 00 ff ff ff ff ff ff ff
 Address 0x70: ff ff ff 60 00 00 00 00 00 00 00 00 00 00 00 00
 MIC 0          REV 06   750-037214   ZW3574           AS-MSC
Jedec Code:    0x7fb0            EEPROM Version:    0x02
P/N:           750-037214        S/N:               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 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 12.3 for MX2010 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.

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

List of Sample Output
show chassis in-service-upgrade on page 983
show chassis in-service-upgrade (MX2010 Router) on page 983
show chassis in-service-upgrade (MX2020 Router) on page 983

Output Fields Table 68 on page 982 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 68: show chassis in-service-upgrade Output Fields

Field Name	Field Description
Item	Flexible PIC Concentrator (FPC) slot number.
Status	FPC and corresponding PIC state. State can be either of the follwing: • **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 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 routers (or line-card chassis) connected to the TX Matrix router. On a TX Matrix Plus router, display the status of all T1600 routers (or line-card chassis) connected to the TX Matrix Plus router.

Options This command has no options.

Required Privilege Level view

Related Documentation

- request chassis lcc on page 397
- Configuring Line-Card Upgrade Groups for Nonstop Software Upgrade (CLI Procedure)
- fpc

List of Sample Output show chassis lccs on page 984

Output Fields Table 69 on page 984 lists the output fields for the **show chassis lccs** command. Output fields are listed in the approximate order in which they appear.

Table 69: show chassis lccs Output Fields

Field Name	Field Description
Slot	LCC slot number.
State	LCC status: • **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 location

Syntax

show chassis location

Syntax (TX Matrix Router)

show chassis location
<fpc | interface (by-name *name* | by-slot fpc *number* lcc *number*) | lcc *number* | scc>

Syntax (TX Matrix Plus Router)

show chassis location
<fpc | interface (by-name *name* | by-slot fpc *number* lcc *number*) | lcc *number* | sfc *number*>

Syntax (MX Series Router)

show chassis location
<all-members>
<local>
<member *member-id*>

Syntax (QFX Series)

show chassis location
<interconnect-device *name*>
<node-device *name*>

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.

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 T1600 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 and TX Matrix Plus routers only) (Optional) Display the physical location of all Flexible PIC Concentrators (FPCs).

interconnect-device *name*—(QFabric systems only) (Optional) Display the physical location of the Interconnect device.

interface by-name *name*—(TX Matrix and TX Matrix Plus routers only) (Optional) Display the physical location of a specified interface name. On a TX Matrix router, this option displays the FPC number and T640 router (or line-card chassis) number associated with the specified interface. On a TX Matrix Plus router, this option displays the FPC number and T1600 router (or 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 (or 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 T1600 router (or 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**. 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 **3**.

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 (or line-card chassis) that is connected to a TX Matrix router. On a TX Matrix Plus router , display the physical location of 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 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 (or 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

List of Sample Output

show chassis location on page 987
show chassis location fpc (TX Matrix Router) on page 987
show chassis location interface by-slot (TX Matrix Router) on page 987
show chassis location fpc (TX Matrix Plus Router) on page 987
show chassis location interface by-slot (TX Matrix Plus Router) on page 987
show chassis location (QFX3500 Switches) on page 988
show chassis location (QFabric Systems) on page 988

Output Fields

Table 70 on page 986 lists the output fields for the **show chassis location** command. Output fields are listed in the approximate order in which they appear.

Table 70: show chassis location Output Fields

Field Name	Field Description
country-code	Country code information.

Table 70: show chassis location Output Fields *(continued)*

Field Name	Field Description
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**.
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 T1600 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 T1600 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

```
user@host> show chassis location interface by-slot fpc 2 lcc 1
Global FPC: 10
```

(TX Matrix Plus Router)

show chassis location (QFX3500 Switches)

```
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

Syntax
show chassis mac-addresses

Syntax (TX Matrix Router)
show chassis mac-addresses
<lcc *number* | scc>

Syntax (TX Matrix Plus Router)
show chassis mac-addresses
<lcc *number* | sfc *number*>

Syntax (MX Series Router)
show chassis mac-addresses
<all-members>
<local>
<member *member-id*>

Syntax (MX2010 3D Universal Edge Routers)
show chassis mac-addresses

Syntax (MX2020 3D Universal Edge Routers)
show chassis mac-addresses

Syntax (QFX Series)
show chassis mac-addresses
<interconnect-device *name*>
<node-group *name*>

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.

Description
Display the media access control (MAC) addresses for the router, switch chassis, or switch.

Options
none—(TX Matrix, TX Matrix Plus routers, and the QFX Series) 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 T1600 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 (or line-card chassis) that is connected to the TX Matrix Plus router. On a TX Matrix Plus router, display MAC addresses for a specified T640 router (or line-card chassis) that is connected to the TX Matrix Plus router. Replace ***number*** with a value from **0** through **3**.

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 (or switch-card chassis).

sfc *number*—(TX Matrix Plus routers only) (Optional) Display MAC addresses for the TX Matrix Plus router (or switch-fabric chassis).

Required Privilege Level

view

Related Documentation

- ACX2000 and ACX2100 Routers Hardware and CLI Terminology Mapping

List of Sample Output

Output Fields

Table 71 on page 990 lists the output fields for the **show chassis mac-addresses** command. Output fields are listed in the approximate order in which they appear.

Table 71: 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.

Table 71: show chassis mac-addresses Output Fields *(continued)*

Field Name	Field Description
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 (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 (QFX3500 Switches)

```
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

```
user@switch> show chassis mac-addresses node-group NW-NG-0
MAC address information:
------------------------
```


node-group (QFabric Systems)

```
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
Command introduced in Junos OS Release 9.4.
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.

Description
(MX Series routers only) 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, or Enhanced Ethernet Network Services mode.

Options
This command has no options.

Required Privilege Level
view

List of Sample Output
show chassis network services on page 995
show chassis network services (MX2010 Router) on page 995
show chassis network services (MX2020 Router) on page 995

Output Fields
Table 72 on page 995 lists the output fields for the **show chassis network services** command. Output fields are listed in the approximate order in which they appear.

Table 72: show chassis network services Output Fields

Field Name	Field Description
Network Services Mode	Network services mode configured for the MX Series router: • **IP**—IP Network Services mode. • **Ethernet**—Ethernet Network Services mode. • **enhanced-ip**—Enhanced IP Network Services mode • **enhanced-ethernet**—Enhanced Ethernet Network Services mode

Sample Output

show chassis network services

```
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 pic

Syntax

show chassis pic fpc-slot *slot-number* pic-slot *slot-number*

Syntax (TX Matrix and TX Matrix Plus Routers)

show chassis pic fpc-slot *slot-number* pic-slot *slot-number*
<lcc *number*>

Syntax (MX Series Routers)

show chassis pic fpc-slot *slot-number* pic-slot *slot-number*
<all-members>
<local>
<member *member-id*>

Syntax (MX2010 3D Universal Edge Routers)

show chassis pic fpc-slot *slot-number* pic-slot *slot-number*

Syntax (MX2020 3D Universal Edge Routers)

show chassis pic fpc-slot *slot-number* pic-slot *slot-number*

Syntax (QFX Series)

show chassis pic
<interconnect-device *name* (fpc-slot *slot-number* | pic-slot *slot-number*)>
<node-device *name* pic-slot *slot-number*>

Syntax (ACX Series Universal Access Routers)

show chassis pic fpc-slot *slot-number* pic-slot *slot-number*

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.

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**.
- 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**.
- 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 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 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 T1600 router (or line-card chassis) that is connected to the TX Matrix Plus router. Replace ***number*** with a value from **0** through **3**.

local—(MX Series routers only) (Optional) Display PIC information for the local Virtual Chassis member.

member ***member-id***—(MX Series routers 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.

Required Privilege Level

view

Related Documentation

- request chassis pic on page 403
- show chassis hardware on page 878
- Configuring the PIC Type
- 100-Gigabit Ethernet PIC Overview

List of Sample Output

show chassis pic fpc-slot pic-slot (QFX3500 Switch) on page 1006
show chassis pic interconnect-device fpc-slot pic-slot (QFabric Systems) on page 1006
show chassis pic node-device fpc-slot pic-slot (QFabric System) on page 1006
show chassis pic fpc-slot 0 pic-slot 1 (ACX2000 Universal Access Router) on page 1007
show chassis pic FPC-slot 1 PIC-slot 0 (MX Routers with Media Services Blade [MSB]) on page 1008
show chassis pic FPC slot 1, PIC slot 2 (MX Routers with Media Services Blade [MSB]) on page 1008

Output Fields Table 73 on page 999 lists the output fields for the **show chassis pic** command. Output fields are listed in the approximate order in which they appear.

Table 73: show chassis pic Output Fields

Field Name	Field Description
Type	PIC type. 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**.
ASIC type	Type of ASIC on the PIC.
State	Status of the PIC. State is displayed only when a PIC is in the slot. • **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)	Port-level information for the PIC. • 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

Table 73: show chassis pic Output Fields *(continued)*

Field Name	Field Description

PIC Port Information (MX960 Router Bidirectional Optics)	Port-level information for the PIC.
	• 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.
	  ◦ 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)	Port-level information for the next-generation SONET/SDH SFP PIC. • 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.
Multirate Mode	Rate-selectabilty 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

```
user@host> show chassis pic fpc-slot 4 pic-slot 1
FPC slot 4, PIC slot 1 information:
  Type                             10x 1GE(LAN)
```

(MX960 Router Bidirectional Optics)

```
  State                            Online
  PIC version                  0.0
  Uptime                         18 days, 5 hours, 41 minutes, 54 seconds

PIC port information:
                          Fiber                    Xcvr vendor
  Port  Cable type        type  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                TRXBG1LXDBBMH-J1  1310 nm
  8     SFP-1000BASE-BX10-U SM  OCP                TRXBG1LXDBBMH-J1  1310 nm
  9     SFP-1000BASE-BX10-U SM  SumitomoElectric   SBP6H44-J3-BW-31  1310 nm
```

show chassis pic fpc-slot pic-slot (MX480 Router with 100-Gigabit Ethernet MIC)

```
user@host> show chassis pic fpc-slot 1 pic-slot 2
FPC slot 1, PIC slot 2 information:
  Type                         1X100GE CFP
  State                        Online
  PIC version                  2.10
  Uptime                       4 minutes, 48 seconds

PIC port information:
        Fiber                    Xcvr vendor
  Port  Cable type        type  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

```
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
```


Application Services Modular Line Card)

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
  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+
  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 (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:
                          Fiber                  Xcvr vendor
  Port  Cable type        type  Xcvr vendor        part number       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

```
user@host> show chassis pic pic-slot 0 fpc-slot 8
lcc0-re0:
--------------------------------------------------------------------------
```

(TX Matrix Plus Router)

```
FPC slot 8, PIC slot 0 information:
  Type                              1x 10GE(LAN/WAN)
  State                             Online
  Uptime                          2 hours, 46 minutes, 23 seconds

PIC port information:
                          Fiber
  Port  Cable type        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:
                           Fiber                        Xcvr vendor
   Port  Cable type        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

```
user@host> show chassis pic fpc-slot 0 pic-slot 1
FPC slot 0, PIC slot 1 information:
  Type                              4x CHOC3 SONET CE SFP
```

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:
                           Fiber                    Xcvr vendor
  Port  Cable type         type  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-8OC3OC12-4OC48
  State                             Online
  PIC version                   1.8
  Uptime                          3 days, 22 hours, 3 minutes, 50 seconds

PIC port information:
                           Fiber                    Xcvr vendor
  Port  Cable type         type  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:
                           Fiber                    Xcvr vendor
  Port  Cable type         type  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

```
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
```

[Multi-Rate] MIC with SFP)

```
PIC port information:
                          Fiber                    Xcvr vendor
  Port  Cable type        type  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-1OC192-XFP
  State                            Online
  PIC version                      1.2
  Uptime                           1 day, 11 hours, 4 minutes, 6 seconds

PIC port information:
                          Fiber                    Xcvr vendor
  Port  Cable type        type  Xcvr vendor        part number       Wavelength
  0     OC192 short reach n/a   FINISAR CORP.      FTLX1412M3BCL-J3  1310 nm
```

show chassis pic fpc-slot 1 pic-slot 2 (8-port DS3/E3 MIC)

```
user@host> show chassis pic fpc-slot 1 pic-slot 2
FPC slot 1, PIC slot 2 information:
  Type                             MIC-3D-8DS3-E3
  State                            Online
  PIC version                      1.10
  Uptime                           4 days, 1 hour, 29 minutes, 19 seconds
  Channelization Mode              Disabled
```

show chassis pic fpc-slot pic-slot (OTN)

```
user@host> show chassis pic fpc-slot 5 pic-slot 0
PIC fpc slot 5 pic slot 0 information:
     Type                             1x10GE(LAN),OTN
     ASIC type                        H chip
     State                            Online
     PIC version                   1.0
     Uptime                        5 minutes, 50 seconds
```

show chassis pic fpc-slot pic-slot (QFX3500 Switch)

```
user@switch> show chassis pic fpc-slot 0 pic-slot 0
FPC slot 0, PIC slot 0 information:
Type 48x 10G-SFP+ Builtin
State Online
Uptime 3 days, 3 hours, 5 minutes, 20 seconds
```

show chassis pic 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-GEBuiltin
  State                            Online
  Uptime                         2 hours, 47 minutes, 40 seconds
```

show chassis pic node-device fpc-slot

```
user@switch> show chassis pic node-device node1 pic-slot 0
FPC slot node1, PIC slot 0 information:
  Type                             48x 10G-SFP+Builtin
```

pic-slot (QFabric System)

```
  State                              Online
  Uptime                           2 hours, 52 minutes, 37 seconds

PIC port information:
                          Fiber                    Xcvr vendor
  Port  Cable type        type  Xcvr vendor        part number        Wavelength
  0     10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  1     10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  2     10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  3     10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  4     10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  5     10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  6     10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  7     10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  8     10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  9     10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  10    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  11    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  12    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  13    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  14    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  15    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  16    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  17    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  18    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  19    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  20    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  21    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  22    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  23    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  24    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  25    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  26    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  27    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  28    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  29    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  30    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  31    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  32    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  33    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  34    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  35    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  36    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  37    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  38    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  39    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  40    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  41    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  42    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  43    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  44    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  45    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  46    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
  47    10GBASE SR        MM    SumitomoElectric   SPP5101SR-J3       850 nm
```

show chassis pic fpc-slot 0 pic-slot 1

```
user@host> show chassis pic fpc-slot 0 pic-slot 1
FPC slot 0, PIC slot 1 information:
  Type                               8x 1GE(LAN) RJ45 Builtin
```

(ACX2000 Universal Access Router)

```
  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-MSC
  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-ratings

Syntax show chassis power-ratings

Release Information Command introduced in Junos OS Release 8.4.

Description (J Series routers only) Display the low-power consumption, high-power consumption, and heat dissipation ratings of the router. Low-power consumption, high-power consumption, and heat dissipation values are represented in nondimensional tokens.

Options This command has no options.

Required Privilege Level view

List of Sample Output
show chassis power-ratings on page 1011
show chassis power-ratings (Power Management Disabled) on page 1011

Output Fields Table 74 on page 1009 lists the output fields for the **show chassis power-ratings** command. Output fields are listed in the approximate order in which they appear.

Table 74: show chassis power-ratings Output Fields

Field Name	Field Description
Device	Physical Interface Module (PIM) slot. (PIM slot numbers appear as FPC numbers in the output.)
Total Tokens	Maximum number of low-power, high-power, and heat tokens available for the router: • **Low Power**—Maximum number of low-power consumption tokens available for the router. • **High Power**—Maximum number of high-power consumption tokens available for the router. • **Heat**—Maximum number of heat tokens available for the router.

Table 74: show chassis power-ratings Output Fields *(continued)*

<table>
<tr><th>Field Name</th><th>Field Description</th></tr>
<tr><td>FPC number</td><td>PIM slot number and power and heat information for the PIM in this slot:
Low Power—PIM low-power consumption. The number of low-power tokens used by the PIM.
High Power—PIM high-power consumption. The number of high-power tokens used by the PIM.
Heat—The number of PIM heat dissipation tokens used by this PIM.
Ratings—Status of the PIM slot. The status of the slot is based on either the configuration of the slot or the power use and heat dissipation of the PIM in that slot:
NOTE: The request chassis fpc command has no effect on the status of the PIM slot.
OK—The PIM in this PIM slot can be brought online.
Exceeded—The PIM cannot be brought online because the PIM slot has been disabled by J Series power management. The PIM in this PIM slot exceeds the maximum number of low-power tokens, high-power tokens, or heat tokens.
Empty—No PIM is installed in the PIM slot.
Cfg offline—The PIM cannot be brought online because the PIM slot has been disabled by the set chassis fpc offline command.</td></tr>
<tr><td>Tokens Used</td><td>Total number of low-power, high-power, and heat tokens used by the router:
Low Power—The total number of low-power tokens used by the router.
High Power—The total number of high-power tokens used by the router.
Heat—Number of heat tokens used by the router.
Ratings—If blank, J Series power management is enabled. No Power Mgmt indicates that J Series power management has been disabled by the set chassis disable_power_management command.
NOTE: Use extreme caution when disabling J Series power management. To prevent equipment damage, do not install a combination of PIMs that exceeds the power and heat capacity of the router when J Series power management is disabled.</td></tr>
</table>

Sample Output

show chassis power-ratings

```
user@host> show chassis power-ratings
Device          Low        High   Heat     Ratings
                Power      Power
Total Tokens    83         83     83       -
FPC 1           6          27     21       OK
FPC 2           3          27     18       OK
FPC 3           0          0      0        Empty
FPC 4           0          0      0        Empty
FPC 5           2          0      2        Exceeded
Tokens Used     11         54     41       -
```

show chassis power-ratings (Power Management Disabled)

```
user@host> show chassis power-ratings
Device          Low        High   Heat     Ratings
                Power      Power
Total Tokens    83         83     83       -
FPC 1           6          27     21       OK
FPC 2           3          27     18       OK
FPC 3           0          0      0        Empty
FPC 4           0          0      0        Empty
FPC 5           2          0      2        Exceeded
Tokens Used     11         54     41       No Power Mgmt
```


show chassis power

Syntax show chassis power

Syntax (MX Series Router) show chassis power
<all-members>
<local>
<member *member-id*>

Syntax (MX2020 3D Universal Edge Routers) show chassis power

Syntax (PTX Series) show chassis power
<detail>

Syntax (MX2010 3D Universal Edge Routers) show chassis power

Release Information Command introduced in Junos OS Release 10.0.
Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Switches.
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 Switches only) Display power limits and usage information for the AC or DC power sources.

- On the MX Series 3D Universal Edge Routers, power is supplied by Power Entry Modules (PEMs).

NOTE: The new high-capacity (4100 W) enhanced DC PEM on MX960 routers includes a new design that can condition the input voltage. This results in the output voltage differing from the input voltage. The earlier generation of DC PEMs coupled the input power directly to the output, thereby making it safe to assume that the output voltage was equal to the input voltage.

- On the MX2020 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 Switches, power is supplied by power distribution units (PDUs). Each PDU contains up to four Power Supply Modules (PSMs).

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—(PTX Series only) (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
- Checklist for Monitoring Power Supplies

List of Sample Output

Output Fields

Table 75 on page 1014 lists the output fields for the **show chassis power** command. Output fields are listed in the approximate order in which they appear.

Table 75: show chassis power Output Fields

Field Name	Field Description	Level of Output

PEM ***number***	(MX Series routers only) AC or DC PEM number on the chassis. The following output fields are displayed for the PEM:
	
	• **State**—State of the PEM:
	  ◦ **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.
	
	NOTE: The maximum capacity for AC and DC PEMs is:
	
	◦ 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 75: show chassis power Output Fields *(continued)*

<table>
<tr><th>Field Name</th><th>Field Description</th><th>Level of Output</th></tr>
<tr><td>System</td><td>(MX Series, MX2020, and MX2010 routers only) Overall power statistics for the system zone.

The following output fields are displayed for MX Series routers:
Zone number:
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.
The following output fields are displayed for MX2010 and MX2020 routers:
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.
NOTE: For MX2020 routers, there are two power subsystems (Lower Zone and Upper Zone) and the listed output fields are displayed for each zone.</td><td>All levels</td></tr>
<tr><td>Total Power</td><td>(PTX Series only) Total power used by the switch (displayed in watts).</td><td>All levels</td></tr>
<tr><td>PDU number</td><td>(PTX Series only) ID number of the power distribution unit (PDU) on the chassis..</td><td>All levels</td></tr>
</table>

Table 75: show chassis power Output Fields *(continued)*

Field Name	Field Description	Level of Output

PSM *number*	(PTX Series, MX2020 routers, and MX2010 routers only) ID number of the Power Supply Unit contained in the PDU.
	
	(PTX Series) The following output fields are displayed for each PSM:
	• **Input (V)**—Voltage supplied to the PSM.
	• **Used (W)**—Actual power usage for the PSM (measured in watts).
	
	(MX2010 and MX2020 routers) The following output fields are displayed for each PSM:
	• **State**—State of the PSM:
	  ◦ **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 parantheses).
	• **Capacity**—Actual power input capacity and maximum capacity (in parantheses) displayed in watts.
	
	NOTE: The maximum capacity for AC and DC PSMs is:
	◦ 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	(PTX Series only) (**detail** keyword only) Actual power usage (measured in watts) for individual FRUs. PTX Switches include the following FRUs: • **Fan Tray *n***—Power usage for the specified fan tray. • **RE*n*/CB*n***—Power usage for the specified Routing Engines and Control Boards • **SIB/CCG/FPD**—Power usage for the Switch Interface Board, Centralized Clock Generator, and Front Panel Display (craft interface). • **FPC *n***—Power usage for the FPC in the slot specified.	**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 (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 (PTX5000 Packet Transport Switch)

```
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 detail (PTX5000

```
user@host> show chassis power detail
Chassis Power         Input(V)       Used(W)
```

Packet Transport Switch)

```
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 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.

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 Configuration Guide*.

Required Privilege Level view

List of Sample Output show chassis psd on page 1024

Output Fields Table 76 on page 1024 lists the output fields for the **show chassis psd** command. Output fields are listed in the approximate order in which they appear.

Table 76: show chassis psd Output Fields

Field Name	Field Description
Slot Description	PSD identification.
State	PSD status: • **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 *group-name*>

Release Information

Command introduced in Junos OS Release 8.2.

Description

(M120 routers only) Display information about the status of configured Forwarding Engine Board (FEB) redundancy groups.

Options

none—Display information about the status of all configured FEB redundancy groups.

redundancy-group ***group-name***—(Optional) Display information about the specified configured redundancy group.

errors—(Optional) Display information about any errors encountered on the components in configured redundancy groups or on links between a FEB and a Flexible PIC Concentrator (FPC).

Required Privilege Level

view

Related Documentation

- request chassis redundancy feb slot on page 406
- Configuring FEB Redundancy on the M120 Router
- Switching Control Board Redundancy

List of Sample Output

show chassis redundancy feb on page 1026
show chassis redundancy feb redundancy-group grp1 on page 1026
show chassis redundancy feb redundancy-group grp0 errors on page 1026

Output Fields

Table 77 on page 1025 lists the output fields for the **show chassis redundancy feb** command. Output fields are listed in the approximate order in which they appear.

Table 77: 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: • **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 77: 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: • **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                    Not ready
  1     Online                     5               Active
  Auto-failover:  Enabled
 Group:        grp0
  FEB   State            Priority  Connected FPCs  Redundancy state
  3     Offline          Backup                    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                    Ready
  Autofailover:  Enabled
  Switch-reason: Switchover from CLI
```

show chassis redundancy feb

```
user@host> show chassis redundancy feb redundancy-group grp0 errors
Group: grp0
    FEB: 0    State: Online
```

redundancy-group grp0 errors

```
    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

Syntax

show chassis routing-engine
<bios | *slot*>

Syntax (EX Series Switches)

show chassis routing-engine
<*slot*>

Syntax (T Series routers)

show chassis routing-engine
<bios | *slot*>

Syntax (TX Matrix Routers)

show chassis routing-engine
<bios | *slot*>
<lcc *number* | scc>

Syntax (TX Matrix Plus Routers)

show chassis routing-engine
<bios | *slot*>
<lcc *number* | sfc *number*>

Syntax (QFX Series)

show chassis routing-engine
<interconnect-device *name*>
<node-device *name*>

Syntax (MX Series Routers)

show chassis routing-engine
<bios | *slot*>
<all-members>
<local>
<member *member-id*>

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 (ACX Series Universal Access Routers)

show chassis 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 in 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.

Description

Display the status of the Routing Engine.

Options

none—Display information about one or more Routing Engines. On a TX Matrix router, display information about all Routing Engines on the TX Matrix router and its attached T640 routers. On a TX Matrix Plus router, display information about all Routing Engines on the TX Matrix Plus router and its attached T1600 routers.

all-members—(MX Series routers only) (Optional) Display Routing Engine information for all members of the Virtual Chassis configuration.

bios—(Optional) Display the (BIOS) firmware version.

interconnect-device *number*—(QFabric systems only) (Optional) Display Routing Engine information for a specified Interconnect device.

lcc *number*—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display Routing Engine information for a specified T640 router (or line-card chassis) that is connected to the TX Matrix router. On a TX Matrix Plus router, display Routing Engine information for a specified T1600 router (or line-card chassis) that is connected to the TX Matrix Plus router. Replace ***number*** with a value from **0** through **3**.

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.

scc—(TX Matrix routers only) (Optional) Display Routing Engine information for the TX Matrix router (or 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 407
- 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 1033
show chassis routing-engine (M10 Router) on page 1033
show chassis routing-engine (M20 Router) on page 1033

Output Fields Table 78 on page 1030 lists the output fields for the **show chassis routing-engine** command. Output fields are listed in the approximate order in which they appear.

Table 78: 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	Total DRAM available to the Routing Engine's processor.
Memory utilization	Percentage of Routing Engine memory being used.

Table 78: show chassis routing-engine Output Fields *(continued)*

Field Name	Field Description
CPU utilization	Information about the Routing Engine's CPU utilization: • **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.
Routing Engine BIOS Version	BIOS version being run by the Routing Engine.

Table 78: show chassis routing-engine Output Fields *(continued)*

Field Name	Field Description
Last reboot reason	Reason for last reboot, including: • **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 J Series router or 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 (MX240 Router)

```
user@host> show chassis routing-engine
Routing Engine status:
  Slot 0:
    Current state                  Backup
    Election priority              Master (default)
    Temperature                 40 degrees C / 104 degrees F
    CPU temperature             47 degrees C / 116 degrees F
    DRAM                      3584 MB
    Memory utilization           7 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     0 percent
      Interrupt                  0 percent
      Idle                     100 percent
    Model                          RE-S-2000
    Serial ID                      1000703522
    Start time                     2007-12-19 10:35:40 PST
    Uptime                         16 days, 3 hours, 15 minutes, 23 seconds
    Last reboot reason             Router rebooted after a normal shutdown
```

show chassis routing-engine (MX480 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                      2048 MB
    Memory utilization          13 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     2 percent
      Interrupt                  0 percent
      Idle                      98 percent
    Model                          RE-S-1300
    Serial ID                      1000697044
    Start time                     2008-01-04 06:46:08 PST
    Uptime                         8 hours, 17 minutes, 16 seconds
    Last reboot reason             Router rebooted after a normal shutdown
```

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             37 degrees C / 98 degrees F
    DRAM                      2048 MB
    Memory utilization          18 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     4 percent
      Interrupt                  0 percent
      Idle                      96 percent
```

```
    Model                          RE-S-1300
    Serial ID                      1000617944
    Start time                     2006-10-26 12:37:13 PDT
    Uptime                         6 days, 4 hours, 59 minutes, 40 seconds
    Last reboot reason             Router rebooted after a normal shutdown
    Load averages:                 1 minute   5 minute  15 minute
                                       0.16       0.08       0.02
```

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                 3 degrees C / 37 degrees F
    CPU temperature             3 degrees C / 37 degrees F
    DRAM                      17152 MB
    Memory utilization          13 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     4 percent
      Interrupt                  2 percent
      Idle                      95 percent
    Model                          RE-S-1800x4
    Serial ID                      9009099704
    Start time                     2012-10-02 14:33:32 PDT
    Uptime                         14 hours, 39 minutes, 39 seconds
    Last reboot reason             Router rebooted after a normal shutdown.
    Load averages:                 1 minute   5 minute  15 minute
                                       0.06       0.05       0.01
Routing Engine status:
  Slot 1:
    Current state                  Backup
    Election priority              Backup (default)
    Temperature                 1 degrees C / 33 degrees F
    CPU temperature             2 degrees C / 35 degrees F
    DRAM                      17152 MB
    Memory utilization          11 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     0 percent
      Interrupt                  0 percent
      Idle                     100 percent
    Model                          RE-S-1800x4
    Serial ID                      9009099706
    Start time                     2012-10-02 10:36:06 PDT
    Uptime                         18 hours, 36 minutes, 57 seconds
    Last reboot reason             Router rebooted after a normal shutdown.
    Load averages:                 1 minute   5 minute  15 minute
                                       0.01       0.00       0.00
```

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                 6 degrees C / 42 degrees F
    CPU temperature             6 degrees C / 42 degrees F
```



```
    DRAM                         17152 MB
    Memory utilization             14 percent
    CPU utilization:
      User                          1 percent
      Background                    0 percent
      Kernel                        7 percent
      Interrupt                     2 percent
      Idle                         91 percent
    Model                          RE-S-1800x4
    Serial ID                      9009089704
    Start time                     2012-10-02 11:05:24 PDT
    Uptime                         2 days, 15 hours, 49 minutes, 13 seconds
    Last reboot reason             Router rebooted after a normal shutdown.
    Load averages:                 1 minute   5 minute  15 minute
                                       0.10       0.05       0.01
Routing Engine status:
  Slot 1:
    Current state                  Backup
    Election priority              Backup (default)
    Temperature                 7 degrees C / 44 degrees F
    CPU temperature             5 degrees C / 41 degrees F
    DRAM                         17152 MB
    Memory utilization             12 percent
    CPU utilization:
      User                          0 percent
      Background                    0 percent
      Kernel                        0 percent
      Interrupt                     0 percent
      Idle                         99 percent
    Model                          RE-S-1800x4
    Serial ID                      9009094138
    Start time                     2012-10-02 11:09:57 PDT
    Uptime                         2 days, 15 hours, 44 minutes, 27 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 (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

user@host> show chassis routing-engine
```

show chassis routing-engine (T1600 router)

```
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

user@host> show chassis routing-engine bios
```


show chassis routing-engine bios (TX Matrix Router)

```
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 (PTX

```
user@switch> show chassis routing-engine
Routing Engine status:
  Slot 0:
```

Series Packet Transport Switch)

```
    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 (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

```
user@host> show chassis routing-engine
Routing Engine status:
    Temperature              36 degrees C / 96 degrees F
```

(ACX1000 Universal Access Router)

```
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

- Checklist for Monitoring the SCB

List of Sample Output show chassis scb on page 1049

Output Fields Table 79 on page 1048 lists the output fields for the **show chassis scb** command. Output fields are listed in the approximate order in which they appear.

Table 79: 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: • **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

show chassis sfb
< slot *sfb-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.

Description

Display chassis information about the Switch Fabric Board (SFB).

Options

none—Display chassis information about all Switch Fabric Boards.

sfb-slot-number—(Optional) Display chassis information about the specified Switch Fabric Board. For MX2020 and MX2010 routers, replace ***sfb-slot-number*** with a value from 0 through 7.

Required Privilege Level

view

Related Documentation

- request chassis sfb

List of Sample Output

show chassis sfb (MX2020 Router) on page 1051
show chassis sfb (MX2010 Router) on page 1051

Output Fields

Table 80 on page 1050 lists the output fields for the **show chassis sfb** command. Output fields are listed in the approximate order in which they appear.

Table 80: show chassis sfb Output Fields

Field Name	Field Description
Slot	Slot number.
State	Status of the SFB. • **Online**—The SFB is online and running. • **Offline**— SFB is powered down.
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 <*sfm-slot*>>

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

none—Display standard status information about all SFMs.

detail—(Optional) Display detailed SFM status information.

sfm-slot—(Optional) Display status information about the SFM in the specified slot only. For the M40e router, replace ***sfm-slot*** with **0** or **1**. For the M160 router, replace ***sfm-slot*** with a value from **0** through **3**.

Required Privilege Level

view

Related Documentation

- request chassis sfm on page 413
- request chassis sfm master switch on page 412
- Switching the Global Master and Backup Roles in a Virtual Chassis Configuration

List of Sample Output

show chassis sfm (M160 Router) on page 1054
show chassis sfm detail (M40e Router) on page 1054
show chassis sfm detail (M160 Router) on page 1054

Output Fields

Table 81 on page 1052 lists the output fields for the **show chassis sfm** command. Output fields are listed in the approximate order in which they appear.

Table 81: 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: • **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 81: 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:
               Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State      (C)  Total  Interrupt      DRAM (MB) Heap      Buffer
  0  Online      39      0          0       64         0            6
  1  Online      43      0          0       64         0            6
  2  Empty        0      0          0        0         0            0
  3  Empty        0      0          0        0         0            0
```

show chassis sfm detail (M40e Router)

```
user@host> show chassis sfm detail
Slot 0 information:
  State                                 Offline
  Reason:                               - power configured off
Slot 1 information:
  State                                 Present
  SPP temperature                    0 degrees C / 32 degrees F
  SPR temperature                    0 degrees C / 32 degrees F
  Total CPU DRAM                      0 MB
  Total SSRAM                         0 MB
```

show chassis sfm detail (M160 Router)

```
user@host> show chassis sfm detail
Slot 0 information:
  State                                 Online
  SPP temperature                    37 degrees C / 98 degrees F
  SPR temperature                    39 degrees C / 102 degrees F
  Total CPU DRAM                     64 MB
  Total SSRAM                         8 MB
  Internet Processor II                 Version 1, Foundry IBM, Part number 9
  Start time:                           2004-08-17 09:23:08 PDT
  Uptime:                             72 days, 1 hour, 15 minutes, 57 seconds
Slot 1 information:
  State                                 Online
  SPP temperature                    36 degrees C / 96 degrees F
  SPR temperature                    37 degrees C / 98 degrees F
  Total CPU DRAM                     64 MB
  Total SSRAM                         8 MB
  Internet Processor II                 Version 1, Foundry IBM, Part number 9
  Start time:                           2004-08-17 09:23:08 PDT
  Uptime:                             72 days, 1 hour, 15 minutes, 57 seconds
Slot 2 information:
....
Packet scheduling mode : Disabled
```

show chassis sibs

Syntax show chassis sibs

Syntax (TX Matrix Router) show chassis sibs
<lcc *number* | scc>

Syntax (TX Matrix Plus Router) show chassis sibs
<lcc *number* | sfc *number*>

Syntax (PTX Series Packet Transport Switches) 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 Switches.
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 Switch in Junos OS Release 12.1

Description (M320 and T Series routers only) Display Switch Interface Boards (SIBs) status information.

Options

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 T1600 routers.

detail—(PTX Series) (Optional) Display detailed SIB status information.

lcc *number*—(TX Matrix and TX Matrix Plus router only) (Optional) On a TX Matrix router, display SIB status 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 SIB status information for a specified T1600 router that is connected to the TX Matrix Plus router. Replace ***number*** with a value from **0** through **3**.

scc—(TX Matrix routers only) (Optional) Display SIB status information for the TX Matrix router (or switch-card chassis).

sfc *number*—(TX Matrix Plus routers only) (Optional) Display SIB status information for the TX Matrix Plus router (or switch-fabric chassis). 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 414
- show chassis spmb sibs on page 1072
- show chassis environment sib on page 619
- Monitoring the SIBs
- M320 SIB Description

List of Sample Output

Output Fields

Table 82 on page 1056 lists the output fields for the **show chassis sibs** command. Output fields are listed in the approximate order in which they appear.

Table 82: show chassis sibs Output Fields

Field Name	Field Description
Slot	SIB slot number.
Type	(TX Matrix Plus router only) SIB type.
Uptime	How long the SIB has been up and running.
State	SIB status: • **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 (or 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. • **Online**—SIB is operational and running. • **Offline**—SIB is powered down. 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.

Table 82: show chassis sibs Output Fields *(continued)*

Field Name	Field Description

	• **Spare**—SIB is redundant and will move to active state if one of the working SIBs fails to pass traffic.
	
	NOTE: **Spare** does not apply to PTX Series Packet Transport Switches, as there are no spare SIBs.
	
	• **Empty**—No SIB is present.
	
	• **Fault**—SIB is in an alarmed state in which the SIB's plane is not operational for one of the following reasons:
	  • Onboard fabric ASIC is 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.
	The **Check** state can be caused by the following reasons:
	  • 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 a Packet Forwarding Engine cannot be reached on that plane or SIB, a destination error is reported against that SIB.
	
	NOTE: For SIBs in the **Check** state, the output displays some additional information:
	
	• 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 Fowarding 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)**.
	
	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**.
	
	  • 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:
	    • 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.

Table 82: show chassis sibs Output Fields *(continued)*

Field Name	Field Description
	◦ 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. NOTE: The **Check** state does not apply to PTX Series Packet Transport Switches. • **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. NOTE: The **Connected**, **Disconnected**, and **SFC Error** states are only applicable to the SIBs on an LCC. • **Invalid**—The specific SIB slot is not valid for 4-LCC chassis configuration. See the *TX Matrix Plus Hardware Guide* for more information about the supported SIB slots. NOTE: The **Invalid** state is applicable to TX Matrix Plus routers only.
Fabric links	Indicates status of fabric links on the SIB. • **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	Indicates if there is any error on the SIB. • **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 atleast one of the SIB's Fabric links.

Sample Output

show chassis sibs (T640 Router)

```
user@host> show chassis sibs
Slot  State                       Uptime
 0    Empty
 1    Offline                          --- Offlined by cli command ---
 2    Check (21 destination errors)    1 day, 1 hour, 32 minutes, 55 seconds
 3    Check (0 destination errors)     1 day, 1 hour, 32 minutes, 45 seconds
 4    Empty

use "show chassis fabric fpcs" and "show chassis fabric sibs" for more details
```

show chassis sibs (T4000 Router)

```
user@host> show chassis sibs
Slot  State                            Uptime
 0    Spare
 1    Online                           3 hours, 48 minutes, 38 seconds
 2    Online                           3 hours, 48 minutes, 22 seconds
 3    Online                           3 hours, 48 minutes, 5 seconds
 4    Online                           3 hours, 47 minutes, 49 seconds
```

show chassis sibs (TX Matrix Router)

```
user@host> show chassis sibs
scc-re0:
--------------------------------------------------------------------------
Slot  State               Uptime
 0    Empty
 1    Empty
 2    Offline             --- Offlined by cli command ---
 3    Offline
 4    Online              7 days, 21 hours, 50 minutes, 4 seconds
lcc0-re0:
--------------------------------------------------------------------------
Slot  State                            Uptime
 0    Offline                          --- Offlined by cli command ---
 1    Empty
 2    Check (21 destination errors)    1 day, 1 hour, 32 minutes, 55 seconds
 3    Check (0 destination errors)     1 day, 1 hour, 32 minutes, 45 seconds
 4    Empty

use "show chassis fabric fpcs" and "show chassis fabric sibs" for more details
```

show chassis sibs (T1600 Router)

```
user@host> show chassis sibs
Slot
 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          Uptime
```

```
 0    Offline           SIB F13       --- Offlined by cli command ---
 1    Online            SIB F13        4 hours, 1 minute, 39 seconds
 2    Invalid
 3    Empty
 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        4 hours, 2 minutes, 17 seconds
0/2   Online            SIB F2S        4 hours, 2 minutes, 15 seconds
0/4   Online            SIB F2S        4 hours, 2 minutes, 14 seconds
0/6   Online            SIB F2S        4 hours, 2 minutes, 13 seconds
1/0   Online            SIB F2S        4 hours, 2 minutes, 25 seconds
1/2   Online            SIB F2S        4 hours, 2 minutes, 24 seconds
1/4   Online            SIB F2S        4 hours, 2 minutes, 23 seconds
1/6   Online            SIB F2S        4 hours, 2 minutes, 22 seconds
2/0   Online            SIB F2S        4 hours, 2 minutes, 20 seconds
2/2   Online            SIB F2S        4 hours, 2 minutes, 19 seconds
2/4   Online            SIB F2S        4 hours, 2 minutes, 18 seconds
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    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 sfc (TX Matrix Plus Router)

```
user@host> show chassis sibs sfc 0
sfc0-re0:
--------------------------------------------------------------------------
Slot  State             Type          Uptime
 0    Online            SIB F13        4 hours, 15 minutes, 29 seconds
 1    Offline                         --- Offlined by cli command ---
 2    Invalid
 3    Empty
 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        4 hours, 15 minutes, 50 seconds
0/2   Online             SIB F2S        4 hours, 15 minutes, 48 seconds
0/4   Online             SIB F2S        4 hours, 15 minutes, 47 seconds
0/6   Online             SIB F2S        4 hours, 15 minutes, 46 seconds
1/0   Online             SIB F2S        4 hours, 15 minutes, 58 seconds
1/2   Online             SIB F2S        4 hours, 15 minutes, 57 seconds
1/4   Online             SIB F2S        4 hours, 15 minutes, 56 seconds
1/6   Online             SIB F2S        4 hours, 15 minutes, 55 seconds
2/0   Online             SIB F2S        4 hours, 15 minutes, 53 seconds
2/2   Online             SIB F2S        4 hours, 15 minutes, 52 seconds
2/4   Online             SIB F2S        4 hours, 15 minutes, 51 seconds
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
```

show chassis sibs lcc (TX Matrix Plus Router)

user@host> **show chassis sibs lcc 0**

```
lcc0-re0:
--------------------------------------------------------------------------
Slot  State              Uptime
 0    SFC error          3 seconds
 1    Offline            --- Offlined by cli command ---
 2    Empty
 3    Online             1 hour, 18 minutes, 18 seconds
 4    Online             1 hour, 18 minutes, 3 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         None
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
```

```
user@host> show chassis sibs detail
```

show chassis sibs (PTX Series)

```
Slot 4 information
  State                                 Offline
  Reason                                Offlined by cli command
  Fabric links                          Unused
  Errors                                None
```

show chassis spmb

Syntax

show chassis spmb

Syntax (T4000 Routers)

show chassis spmb
<sibs>

Syntax (TX Matrix Routers)

show chassis spmb
<sibs>
<lcc *number* | scc>

Syntax (TX Matrix Plus Routers)

show chassis spmb
<sibs>
<lcc *number* | sfc *number*>

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.

Description

(T Series routers, MX2010 and MX2020 routers only) Display Switch Processor Mezzanine Board (SPMB) status information.

Options

none—(TX Matrix, TX Matrix Plus, 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 T1600 routers. On MX2010 and MX2020 routers, display the SPMB status for the routers.

lcc ***number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display information about the SPMB on a specified T640 router (or 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 T1600 router (or line-card chassis) that is connected to the TX Matrix Plus router. Replace ***number*** with a value from **0** through **3**.

scc—(TX Matrix routers only) (Optional) Display information about the SPMB on the TX Matrix router (or switch-card chassis).

sfc ***number***—(TX Matrix Plus routers only) (Optional) Display information about the SPMB on the TX Matrix Plus router (or switch-fabric chassis). Replace ***number*** with **0**.

sibs—(TX Matrix and TX Matrix Plus routers only) (Optional) Display information about the SIBS on the TX Matrix router (or switch-card chassis) or TX Matrix Plus routers (or switch-fabric chassis). The **sibs** option has the following sub-options:

lcc ***number*** (TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display information about the SIBs on a specified T640 router (or 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 T1600 router (or line-card chassis) that is connected to the TX Matrix Plus router. Replace ***number*** with a value from **0** through **3**.

scc ***number***—(TX Matrix routers only) (Optional) Display information about the SIBs on the TX Matrix router (or switch-card chassis). Replace ***number*** with **0**.

sfc ***number***—(TX Matrix Plus routers only) (Optional) Display information about the SIBs on the TX Matrix Plus router (or switch-fabric chassis). Replace ***number*** with **0**.

Required Privilege Level view

Related Documentation

- request chassis sib on page 414
- request chassis spmb restart on page 420
- show chassis spmb sibs on page 1072

List of Sample Output

Output Fields Table 83 on page 1064 lists the output fields for the **show chassis spmb** command. Output fields are listed in the approximate order in which they appear.

Table 83: show chassis spmb Output Fields

Field Name	Field Description
Slot	SPMB slot number: **0** or **1**.
State	SPMB status: • **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.

Table 83: show chassis spmb Output Fields *(continued)*

Field Name	Field Description
Memory Heap Utilization (%)	Percentage of heap space (dynamic memory) being used by the FPC processor. If this number exceeds 80 percent, there may be a software problem (memory leak).
Buffer Utilization (%)	Percentage of buffer space being used by the SPMB processor for buffering internal messages.
Start time	Time at which the SPMB last came online.
Uptime	How long the SPMB has been up and running.

Sample Output

show chassis spmb

```
user@host> show chassis spmb
Slot 0 information:
  State                          Online
  Total CPU Utilization            1%
  Interrupt CPU Utilization        0%
  Memory Heap Utilization          0%
  Buffer Utilization              40%
  Start time:                    2001-08-27 14:05:04 PDT
  Uptime:                         46 minutes, 36 seconds
```

show chassis spmb (MX2010 Router)

```
user@host> show chassis spmb
Slot 0 information:
  State                          Online
  Total CPU Utilization           12%
  Interrupt CPU Utilization        0%
  Memory Heap Utilization          1%
  Buffer Utilization              22%
  Start time:                    2012-10-04 15:34:29 PDT
  Uptime:                        7 hours, 10 minutes, 15 seconds
Slot 1 information:
  State                          Online - Standby
  Total CPU Utilization            1%
  Interrupt CPU Utilization        0%
  Memory Heap Utilization          0%
  Buffer Utilization              22%
  Start time:                    2012-10-02 14:34:54 PDT
  Uptime:                        2 days, 8 hours, 9 minutes, 50 seconds
```

show chassis spmb (MX2020 Router)

```
user@host> show chassis spmb
Slot 0 information:
  State                          Online
  Total CPU Utilization          100%
  Interrupt CPU Utilization        0%
  Memory Heap Utilization          3%
  Buffer Utilization              22%
  Start time:                    2012-10-03 14:58:26 PDT
  Uptime:                        1 day, 12 hours, 16 minutes, 14 seconds
Slot 1 information:
  State                          Online - Standby
  Total CPU Utilization            0%
  Interrupt CPU Utilization        0%
  Memory Heap Utilization          0%
  Buffer Utilization              22%
  Start time:                    2012-10-03 14:58:27 PDT
  Uptime:                        1 day, 12 hours, 16 minutes, 13 seconds
```

show chassis spmb (T4000 Router)

```
user@host> show chassis spmb

Slot 0 information:
  State                          Online
  Total CPU Utilization           18%
  Interrupt CPU Utilization        0%
  Memory Heap Utilization          0%
  Buffer Utilization              22%
  Start time:                    2012-02-09 22:51:09 PST
```



```
  Uptime:                         2 hours, 25 minutes, 45 seconds
Slot 1 information:
  State                           Online - Standby
  Total CPU Utilization              0%
  Interrupt CPU Utilization          0%
  Memory Heap Utilization            0%
  Buffer Utilization                22%
  Start time:                     2012-02-09 22:51:10 PST
  Uptime:                         2 hours, 25 minutes, 44 seconds
```

show chassis spmb lcc (TX Matrix Router)

```
user@host> show chassis spmb lcc 0
lcc0-re0:
--------------------------------------------------------------------------
Slot 0 information:
  State                           Online
  Total CPU Utilization              0%
  Interrupt CPU Utilization          0%
  Memory Heap Utilization            0%
  Buffer Utilization                42%
  Start time:                     2004-08-05 18:43:38 PDT
  Uptime:                         8 days, 55 minutes, 52 seconds
```

show chassis spmb scc (TX Matrix Router)

```
user@host> show chassis spmb scc
scc-re0:
--------------------------------------------------------------------------
Slot 0 information:
  State                           Online
  Total CPU Utilization              1%
  Interrupt CPU Utilization          0%
  Memory Heap Utilization            0%
  Buffer Utilization                42%
  Start time:                     2004-08-05 18:43:37 PDT
  Uptime:                         8 days, 1 hour, 6 minutes, 51 seconds
```

show chassis spmb (T1600 Router)

```
user@host> show chassis spmb
Slot 0 information:
  State                           Online
  Total CPU Utilization              2%
  Interrupt CPU Utilization          0%
  Memory Heap Utilization            0%
  Buffer Utilization                24%
  Start time:                     2009-05-07 22:34:03 PDT
  Uptime:                         3 days, 4 hours, 14 minutes, 33 seconds
Slot 1 information:
  State                           Online - Standby
  Total CPU Utilization              0%
  Interrupt CPU Utilization          0%
  Memory Heap Utilization            0%
  Buffer Utilization                24%
  Start time:                     2009-05-07 22:34:02 PDT
  Uptime:                         3 days, 4 hours, 14 minutes, 34 seconds
```

show chassis spmb sibs (T1600 Router)

```
user@host> show chassis spmb sibs
Slot  State                   Uptime
 0     Check                 3 days, 4 hours, 11 minutes, 59 seconds
 1     Disconnected          3 days, 4 hours, 12 minutes, 36 seconds
 2     Disconnected          3 days, 4 hours, 12 minutes, 26 seconds
 3     Disconnected          3 days, 4 hours, 12 minutes, 17 seconds
```



```
 4    Disconnected       3 days, 4 hours, 12 minutes, 8 seconds
```

show chassis spmb (TX Matrix Plus Router)

```
user@host> show chassis spmb
sfc0-re0:
--------------------------------------------------------------------------
Slot 0 information:
  State                           Online
  Total CPU Utilization             84%
  Interrupt CPU Utilization          0%
  Memory Heap Utilization            0%
  Buffer Utilization                24%
  Start time:                     2009-05-11 01:25:20 PDT
  Uptime:                         46 minutes, 6 seconds
Slot 1 information:
  State                           Online - Standby
  Total CPU Utilization              0%
  Interrupt CPU Utilization          0%
  Memory Heap Utilization            0%
  Buffer Utilization                24%
  Start time:                     2009-05-11 01:25:20 PDT
  Uptime:                         46 minutes, 6 seconds

lcc0-re1:
--------------------------------------------------------------------------
Slot 0 information:
  State                           Online - Standby
  Total CPU Utilization              0%
  Interrupt CPU Utilization          0%
  Memory Heap Utilization            0%
  Buffer Utilization                24%
  Start time:                     2009-05-11 01:25:09 PDT
  Uptime:                         46 minutes, 24 seconds
Slot 1 information:
  State                           Online
  Total CPU Utilization              5%
  Interrupt CPU Utilization          0%
  Memory Heap Utilization            0%
  Buffer Utilization                24%
  Start time:                     2009-05-11 01:25:08 PDT
  Uptime:                         46 minutes, 25 seconds

lcc1-re1:
--------------------------------------------------------------------------
Slot 0 information:
  State                           Online - Standby
  Total CPU Utilization              1%
  Interrupt CPU Utilization          0%
  Memory Heap Utilization            0%
  Buffer Utilization                24%
  Start time:                     2009-05-11 01:25:09 PDT
  Uptime:                         46 minutes, 24 seconds
Slot 1 information:
  State                           Online
  Total CPU Utilization              5%
  Interrupt CPU Utilization          0%
  Memory Heap Utilization            0%
  Buffer Utilization                24%
  Start time:                     2009-05-11 01:25:10 PDT
  Uptime:                         46 minutes, 23 seconds

lcc2-re1:
```

```
--------------------------------------------------------------------------
Slot 0 information:
  State                          Online - Standby
  Total CPU Utilization             0%
  Interrupt CPU Utilization         0%
  Memory Heap Utilization           0%
  Buffer Utilization               24%
  Start time:                    2009-05-11 01:25:08 PDT
  Uptime:                        46 minutes, 25 seconds
Slot 1 information:
  State                          Online
  Total CPU Utilization             5%
  Interrupt CPU Utilization         0%
  Memory Heap Utilization           0%
  Buffer Utilization               24%
  Start time:                    2009-05-11 01:25:10 PDT
  Uptime:                        46 minutes, 23 seconds

lcc3-re1:
--------------------------------------------------------------------------
Slot 0 information:
  State                          Online - Standby
  Total CPU Utilization             1%
  Interrupt CPU Utilization         0%
  Memory Heap Utilization           0%
  Buffer Utilization               24%
  Start time:                    2009-05-11 01:25:10 PDT
  Uptime:                        46 minutes, 23 seconds
Slot 1 information:
  State                          Online
  Total CPU Utilization             5%
  Interrupt CPU Utilization         0%
  Memory Heap Utilization           0%
  Buffer Utilization               24%
  Start time:                    2009-05-11 01:25:09 PDT
  Uptime:                        46 minutes, 24 seconds
```

show chassis spmb lcc (TX Matrix Plus Router)

```
user@host> show chassis spmb lcc 2
lcc2-re1:
--------------------------------------------------------------------------
Slot 0 information:
  State                          Online - Standby
  Total CPU Utilization             0%
  Interrupt CPU Utilization         0%
  Memory Heap Utilization           0%
  Buffer Utilization               24%
  Start time:                    2009-05-11 01:25:08 PDT
  Uptime:                        45 minutes, 18 seconds
Slot 1 information:
  State                          Online
  Total CPU Utilization             6%
  Interrupt CPU Utilization         0%
  Memory Heap Utilization           0%
  Buffer Utilization               24%
  Start time:                    2009-05-11 01:25:10 PDT
  Uptime:                        45 minutes, 16 seconds
```

show chassis spmb scc (TX Matrix Plus

```
user@host> show chassis spmb sfc 0
sfc0-re0:
--------------------------------------------------------------------------
```


Router)

```
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 sibs

Syntax

show chassis spmb sibs

Syntax (TX Matrix Router)

show chassis spmb sibs
<lcc *number* | scc>

Syntax (TX Matrix Plus Router)

show chassis spmb sibs
<lcc *number* | sfc *number*>

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.

Description

(T Series routers only) Display Switch Processor Mezzanine Board (SPMB) Switch Interface Board (SIB) status information.

Options

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 T1600 routers.

lcc ***number***—(TX Matrix and TX Matrix Plus routers only) (Optional) On a TX Matrix router, display SIB status information for a specified T640 router (or line-card chassis) that is connected to a TX Matrix router. On a TX Matrix Plus router, display SIB status information for 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**.

scc—(TX Matrix router only) (Optional) Display SIB status information for the TX Matrix router (or switch-card chassis).

sfc—(TX Matrix Plus router only) (Optional) Display SIB status information for the TX Matrix Plus router (or switch-fabric chassis).

Additional Information

On a T Series router, you can use either this command or the **show chassis sibs** command to produce the same output. The **show chassis sibs** command is supported on the M320 router and on the T Series routers.

Required Privilege Level

view

Related Documentation

- show chassis sibs on page 1055
- request chassis sib on page 414
- request chassis spmb restart on page 420

List of Sample Output

show chassis spmb sibs (T320 Router) on page 1074
show chassis-spmb-sibs (T1600 Router) on page 1074
show chassis spmb sibs (T4000 Router) on page 1074
show chassis spmb sibs (TX Matrix Router) on page 1074

show chassis spmb sibs lcc (TX Matrix Router) on page 1074
show chassis spmb sibs scc (TX Matrix Router) on page 1074
show chassis spmb sibs (TX Matrix Plus Router) on page 1074
show chassis spmb sibs sfc (TX Matrix Plus Router) on page 1075

Output Fields

Table 84 on page 1073 lists the output fields for the **show chassis spmb sibs** command. Output fields are listed in the approximate order in which they appear.

Table 84: show chassis spmb sibs Output Fields

Field Name	Field Description

Slot	SIB slot number:
	• T640 router, T1600 router or TX Matrix router—**0** through **4**
	• TX Matrix Plus router:
	  ◦ TXP-F13 SIB Slots—**0** through **16**
	  ◦ TXP-F2S SIB Slots —**0** – **4**/[**0**|**2**|**4**|**6**]
	• T320 router—**0** through **2**

State	SIB status:
	• **Disconnected**—SIBs on all T640 routers on the TX Matrix router (or 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.
	• **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:
	  ◦ 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:
	  ◦ 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

user@host> show chassis spmb sibs
```


show chassis spmb sibs (TX Matrix Plus Router)

```
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

```
user@host> show chassis spmb sibs sfc 0
sfc0-re0:
--------------------------------------------------------------------------
```

Plus Router)

```
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

show chassis synchronization
<extensive>
<backup | master>

Release Information

Command introduced in Junos OS Release 7.6 for M320 routers.
Command introduced in Junos OS Release 8.3 for M40e routers.
Command introduced in Junos OS Release 9.3 for M120 routers.
Command introduced in Junos OS Release 10.2 for T320, T640, and T1600 routers.
Command introduced in Junos OS Release 12.1 for PTX Series Packet Transport Switches.
Command introduced in Junos OS Release 12.2 for ACX Series routers.

Description

(ACX Series, M320, M40e,M120, T320, T640, and T1600 routers and PTX Series Packet Transport Switches only) Display information about the external clock source currently used for chassis synchronization.

Options

extensive—(Optional) Display clock synchronization information in detail.

backup—(Optional) Display clock synchronization information about the backup clock.

master— (Optional) Display clock synchronization information about the master clock.

Required Privilege Level

maintenance

Related Documentation

- request chassis synchronization switch on page 421
- Configuring Clock Synchronization Interface for MX Series Routers on page 145
- show chassis synchronization (MX Series Routers) on page 1081

- Supported Time Synchronization Standard
- Configuring External Clock Synchronization for ACX Series Routers

List of Sample Output

show chassis synchronization on page 1079
show chassis synchronization master on page 1079
show chassis synchronization backup on page 1079
show chassis synchronization extensive on page 1079
show chassis synchronization (T320, T640, and T1600 Routers) on page 1079
show chassis synchronization (PTX Series Packet Transport Switches) on page 1080
show chassis synchronization extensive (ACX Series Routers) on page 1080

Output Fields

Table 85 on page 1078 lists the output fields for the **show chassis synchronization** command. Output fields are listed in the approximate order in which they appear.show chassis synchronizationshow chassis synchronizationshow chassis synchronization

Table 85: show chassis synchronization Output Fields

Field Name	Field Description
Current state	Indicates current status of external clock sources: • **backup**—Source is currently the backup clock source. • **master**—Source is currently the master clock source. • **Online-Master**—(PTX Series Packet Transport Switches) Source is the master clock. Source is online. • **Online-Standby**—(PTX Series Packet Transport Switches) Source is the standby (backup) clock. Source is online.
Current clock state	Indicates current source of external synchronization: • **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 Switches) 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	Indicates priority of external clock sources: • **primary**—Source is a primary reference. • **secondary**—Source is a secondary reference.
Deviation (in ppm)	Current difference in clock timing, in ppm: • **measuring**—Establishing source deviation. • ***number***—Deviation in ppm.
Last deviation (in ppm)	Previous difference in clock timing, in ppm: • ***number***—Deviation in ppm.
Status	Indicates status of external sources: • **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,

```
user@host> show chassis synchronization
    Clock Synchronization Status :
      Clock module on SCG 0
```

T640, and T1600 Routers)

```
          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 Switches)

```
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 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 *interface-name*>

Release Information

Command introduced in Junos OS Release 10.4.
clock-module option introduced in Junos OS Release 12.2.

Description

Display information about clocks used for chassis synchronization.

Options

clock-module—(MX240, MX480, and MX960 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 145
- 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 157
- request chassis synchronization mode
- **show chassis synchronization on page 1077**
- **synchronization (MX Series) on page 355**
- Synchronous Ethernet Overview on page 21

List of Sample Output

show chassis synchronization on page 1086
show chassis synchronization extensive on page 1086
show chassis synchronization extensive (Synchronous Ethernet with link down) on page 1086
show chassis synchronization extensive (Synchronous Ethernet with physical interface not restored) on page 1086

show chassis synchronization extensive (Synchronous Ethernet configured on ineligible slot 10) on page 1087
show chassis synchronization interface on page 1087
show chassis synchronization clock-module on page 1087
show chassis synchronization (configured external clock interface) on page 1087
show chassis synchronization clock-module (configured external clock interface) on page 1088
show chassis synchronization extensive (configured external clock interface) on page 1088

Output Fields Table 86 on page 1082 lists the output fields for the **show chassis synchronization** command. Output fields are listed in the approximate order in which they appear.

Table 86: show chassis synchronization Output Fields

Field Name	Field Description	Level of Output
Current clock status	Indicates the current status of chassis synchronization: • **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
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. • **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

Table 86: show chassis synchronization Output Fields *(continued)*

Field Name	Field Description	Level of Output
Interface	Indicates the configured interface: • **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: • **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: • **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: • **Default(8)**—The parameter is not specified. • **- -**—The parameter is undefined or out of range.	**extensive**
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: • **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: • **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: • **ifd**—Uses the free-run local oscillator. • **extern**—Uses a configured qualified clock source.	**extensive**
Clock Event	Indicates the event clock status: • **Clock locked**—Clock is established. • **n/a**—Clock is not established.	**extensive**
Configuration flags	Indicates **Ext** for external interface configuration	

Table 86: show chassis synchronization Output Fields *(continued)*

Field Name	Field Description	Level of Output
Kernel flags	Indicates the Synchronous Ethernet software operational status: • **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**
Ineligibility reason	Indicates the reason the interface is ineligible for the Synchronous Ethernet operation, including the following: • **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	Indicates the role of the clock module: • **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	Indicates the state of the clock module: • **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**

Table 86: show chassis synchronization Output Fields *(continued)*

Field Name	Field Description	Level of Output
Interface	Indicates the interface type and which FPC, PIC, and port are configured: • **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**
Type	Indicates the type of clock source: • **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: • **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,
```

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,
```

Sample Output

show chassis synchronization extensive (Synchronous Ethernet

```
user@host> show chassis synchronization extensive
Current clock status  : Holdover
Configured sources:

Interface           : ge-1/0/2
```

with physical interface not restored)

```
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,
```

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,
```

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

```
user@host> show chassis synchronization
Current clock status  : Free-run
```

(configured external clock interface)

```
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  : 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

Syntax show chassis temperature-thresholds

Syntax (TX Matrix Routers) show chassis temperature-thresholds
<lcc *number* | scc>

Syntax (TX Matrix Plus Routers) show chassis temperature-thresholds
<lcc *number* | sfc *number*>

Syntax (MX Series Routers) show chassis temperature-thresholds
<all-members>
<local>
<member *member-id*>

Syntax (MX2010 3D Universal Edge Routers) show chassis temperature-thresholds

Syntax (MX2020 3D Universal Edge Routers) show chassis temperature-thresholds

Syntax (QFX Series) show chassis temperature-thresholds
<interconnect-device *name*>
<node-device *name*>

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 12.1 for PTX Series Packet Transport Switches.
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 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 (or 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 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 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.

scc—(TX Matrix routers only) (Optional) Display the temperature threshold details of the TX Matrix router (or switch-card chassis).

sfc *number*—(TX Matrix Plus routers only) (Optional) Display the temperature threshold details of the TX Matrix Plus router (or 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 1092
show chassis temperature-thresholds (MX240, MX480, MX960 Routers with Application Services Modular Line Card) on page 1092
show chassis temperature-thresholds (MX2010 Router) on page 1093
show chassis temperature-thresholds (MX2020 Router) on page 1095
show chassis temperature-thresholds (T4000 Core Routers) on page 1098
show chassis temperature-thresholds (TX Matrix Plus Router) on page 1098
show chassis temperature-thresholds lcc (TX Matrix Plus Router) on page 1100
show chassis temperature-thresholds sfc (TX Matrix Plus Router) on page 1100
show chassis temperature-thresholds (QFX3500 Switch and QFX3600) on page 1101
show chassis temperature-thresholds interconnect-device (QFabric System) on page 1101
show chassis temperature-thresholds (PTX5000 Packet Transport Switch) on page 1101
show chassis temperature-thresholds (MX Routers with Media Services Blade [MSB]) on page 1102

Output Fields

Table 87 on page 1091 lists the output fields for the **show chassis temperature-thresholds** command. Output fields are listed in the approximate order in which they appear.

Table 87: 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	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. Temperature threshold settings, in degrees Celsius, for the fans to operate at normal and high speeds. • **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. • **High**—The fans operate at high speed if the component has exceeded this temperature or a fan has failed or is missing. NOTE: For MX480 Routers, there are three fan speeds: **Low**, **Medium**, and **High**. An alarm is not triggered until the temperature exceeds the threshold settings for a yellow alarm or a red alarm.
Yellow alarm	Temperature threshold settings, in degrees Celsius, that trigger a yellow alarm. • **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	Temperature threshold settings, in degrees Celsius, that trigger a red alarm. • **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 and PTX Series Packet Transport Switches 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

                              Fan speed      Yellow alarm      Red alarm
                             (degrees C)      (degrees C)      (degrees C)
Item                         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 (MX240, MX480, MX960 Routers with

```
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
```


Application Services Modular Line Card)

```
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 (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                       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      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 (T4000 Core Routers)

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
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

user@host> **show chassis temperature-thresholds**

```
sfc0-re0:
--------------------------------------------------------------------------
```

(TX Matrix Plus Router)

```
                          Fan speed      Yellow alarm      Red alarm
                         (degrees C)      (degrees C)     (degrees C)
Item                     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:
--------------------------------------------------------------------------
                          Fan speed      Yellow alarm      Red alarm
                         (degrees C)      (degrees C)     (degrees C)
Item                     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:
--------------------------------------------------------------------------
                          Fan speed      Yellow alarm      Red alarm
                         (degrees C)      (degrees C)     (degrees C)
Item                     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:
--------------------------------------------------------------------------
                           Fan speed      Yellow alarm      Red alarm
                         (degrees C)      (degrees C)      (degrees C)
Item                     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

```
user@host> show chassis temperature-thresholds sfc 0
sfc0-re0:
--------------------------------------------------------------------------
```

sfc (TX Matrix Plus Router)

```
                           Fan speed       Yellow alarm        Red alarm
                          (degrees C)      (degrees C)        (degrees C)
Item                      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 (QFX3500 Switch and QFX3600)

```
user@switch> show chassis temperature-thresholds
                           Fan speed      Yellow alarm      Red alarm
                          (degrees C)     (degrees C)      (degrees C)
Item                      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 Mgmnt 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
                           Fan speed       Yellow alarm        Red alarm
Item                      Normal   High   Normal   Bad fan   Normal   Bad fan
Chassis default              48     54       65       55        75        65
```

show chassis temperature-thresholds

```
user@switch> show chassis temperature-thresholds
user@switch> show chassis temperature-thresholds
                     Fan speed      Yellow alarm       Red alarm    Fire Shutdown
```

(PTX5000 Packet Transport Switch)

```
                    (degrees C)      (degrees C)      (degrees C)     (degrees C)
Item                Normal  High    Normal  Bad fan  Normal  Bad fan    Normal
Routing Engine 0       70    75        90      87      102      97       115
Routing Engine 1       70    75        90      87      102      97       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         20    25        65      60       80      75       100
FPC 1 Exhaust A        60    65        78      75       85      80        95
FPC 1 Exhaust B        60    65        78      75       85      80        95
FPC 1 TL0              70    75        90      87      102      97       115
FPC 1 TQ0              70    75        90      87      102      97       115

FPC 1 TL1              70    75        90      87      102      97       115
FPC 1 TQ1              70    75        90      87      102      97       115
FPC 1 TL2              70    75        90      87      102      97       115
FPC 1 TQ2              70    75        90      87      102      97       115
FPC 1 TL3              70    75        90      87      102      97       115
FPC 1 TQ3              70    75        90      87      102      97       115
FPC 2 Exhaust A        60    65        78      75       85      80        95
FPC 2 Exhaust B        60    65        78      75       85      80        95
FPC 2 TL0              70    75        90      87      102      97       115
FPC 2 TQ0              70    75        90      87      102      97       115
FPC 2 TL1              70    75        90      87      102      97       115
FPC 2 TQ1              70    75        90      87      102      97       115
FPC 2 TL2              70    75        90      87      102      97       115
FPC 2 TQ2              70    75        90      87      102      97       115
FPC 2 TL3              70    75        90      87      102      97       115
FPC 2 TQ3              70    75        90      87      102      97       115
PIC 2/0 Ambient        60    65        78      75       85      80        95
PIC 2/0 cfp-2/0/1      60    65        70      67       75      72        85
PIC 2/1 Ambient        60    65        78      75       85      80        95
SIB 0 Exhaust          60    65        78      75       85      80        95
SIB 0 Junction         70    75        90      87      102      97       115
SIB 1 Exhaust          60    65        78      75       85      80        95
SIB 1 Junction         70    75        90      87      102      97       115
SIB 2 Exhaust          60    65        78      75       85      80        95
SIB 2 Junction         70    75        90      87      102      97       115
SIB 3 Exhaust          60    65        78      75       85      80        95
SIB 3 Junction         70    75        90      87      102      97       115
SIB 4 Exhaust          60    65        78      75       85      80        95
SIB 4 Junction         70    75        90      87      102      97       115
SIB 5 Exhaust          60    65        78      75       85      80        95
SIB 5 Junction         70    75        90      87      102      97       115
SIB 6 Exhaust          60    65        78      75       85      80        95
SIB 6 Junction         70    75        90      87      102      97       115
SIB 7 Exhaust          60    65        78      75       85      80        95
SIB 7 Junction         70    75        90      87      102      97       115
SIB 8 Exhaust          60    65        78      75       85      80        95
SIB 8 Junction         70    75        90      87      102      97       115
```

show chassis temperature-thresholds (MX Routers with

```
user@switch> show chassis temperature-thresholds
  Fan speed      Yellow alarm      Red alarm      Fire Shutdown
                          (degrees C)       (degrees C)      (degrees C)
(degrees C)
```


Media Services Blade [MSB])

```
Item                      Normal  High   Normal  Bad fan   Normal  Bad fan
Normal
Chassis default               48    54       65       55       75       65
100
Routing Engine 0              70    80       95       95      110      110
112
Routing Engine 1              70    80       95       95      110      110
112
FPC 0                         55    60       75       65       90       80
95
FPC 1                         55    60       75       65       90       80
95
FPC 2                         55    60       75       65       90       80
95
FPC 4                         55    60       75       65       90       80
95
FPC 5                         55    60       75       65       90       80
95
```

show chassis zones

Syntax

show chassis zones
<detail>

Syntax (QFX Series)

show chassis zones
<detail>
<interconnect-device *name*>

Release Information

Command introduced in Junos OS Release 11.3 for the QFX Series.
Command introduced in Junos OS Release 12.3 for MX2020 3D Universal Edge Routers.
Command introduced in Junos OS Release 12.3 for MX2010 3D Universal Edge Routers.

Description

(QFabric systems only) Display the status of the two cooling system zones on the Interconnect device. Zone 1 consists of eight (0 – 7) front cards, which are cooled by two fan trays. Zone 2 consists of two control boards and eight rear cards, which are cooled by eight (0 – 7) fan trays. On MX2010 and MX2020 routers, display the status of the cooling system zones of the chassis. Zone 0 consists of the Control Board, ten (0–9) FPCs, and their respective PICs, Switch Fabric Boards, and Adapter Cards. Zone 1 consists of the Routing Engine, Control Board, and Switch Processor Mezzanine Boards.

Options

detail—(MX2010 and MX2020 routers only) (Optional) Display detailed status of the cooling system zones.

detail *device-name*— (QFabric systems only) (Optional) Display detailed status of the two cooling systems on the Interconnect device.

interconnect-device *name*— (QFabric systems only) (Optional) Display the status of the cooling zones on the Interconnect device.

Required Privilege Level

view

Related Documentation

- request chassis beacon
- show chassis fan on page 688
- show chassis temperature-thresholds on page 1089

List of Sample Output

show chassis zones interconnect-device (QFabric System) on page 1106
show chassis zones (MX2010 Router) on page 1106
show chassis zones detail (MX2010 Router) on page 1106
show chassis zones (MX2020 Router) on page 1107
show chassis zones detail (MX2020 Router) on page 1107
show chassis beacon interconnect-device (QFabric System) on page 1108
show chassis beacon interconnect-device fpc (QFabric System) on page 1109
show chassis beacon node-device (QFabric System) on page 1109
show chassis beacon node-device fpc (QFabric System) on page 1109

Output Fields

Table 88 on page 1105 lists the output fields for the **show chassis zones** command. Output fields are listed in the approximate order in which they appear.

Table 88: 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: • 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:	
Item	Chassis component: • 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 fib-local-accounting ip

Syntax show fib-local-accounting ip

Release Information Command introduced in Junos OS Release 12.3 for MX Series routers.

Description Display the number of packets that were sent to an anchor MPC due to FIB localization.

Required Privilege Level view

Related Documentation

- fib-remote on page 66
- fib-local on page 66
- Example: Configuring Packet Forwarding Engine FIB Localization on page 62

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
```


PART 4

Index

Index

G

H

I

J

K

L

Q

R

Y