# Junos® OS

## Chassis-Level Features, Junos OS Release 11.4

Release
11.4

Published: 2011-11-08
Revision 1

Juniper Networks, Inc.
1194 North Mathilda Avenue
Sunnyvale, California 94089
USA
408-745-2000
www.juniper.net



*Junos® OS Chassis-Level Features, Junos OS Release 11.4*


Revision History
October 2011—Revision 1; initial release

The information in this document is current as of the date listed in the revision history.

## END USER LICENSE AGREEMENT

# Table of Contents

## Part 4 Index



# List of Figures

# List of Tables

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 {
  port-mirror-instance port-mirroring-instance-name;
  sampling-instance;
  power (off | on);
    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 (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;
  }
  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 21 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 26 and the *TX Matrix Plus Router Hardware Guide*.

**Related Documentation**

- Router Chassis Configuration Statements on page 175

## 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.

NOTE: Port mirroring instances are not supported on MX80 routers. You can, however, configure port mirroring at the global level.

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 *Junos OS 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 67
- Configuring Port-Mirroring Instances on M320 Routers on page 59
- Configuring Port-Mirroring Instances on M120 Routers on page 60

CHAPTER 2

# Router Chassis Clocking and Synchronization Configuration Overview



## Interface and Router Clock Sources Overview



### Interface and Router Clock Sources Description

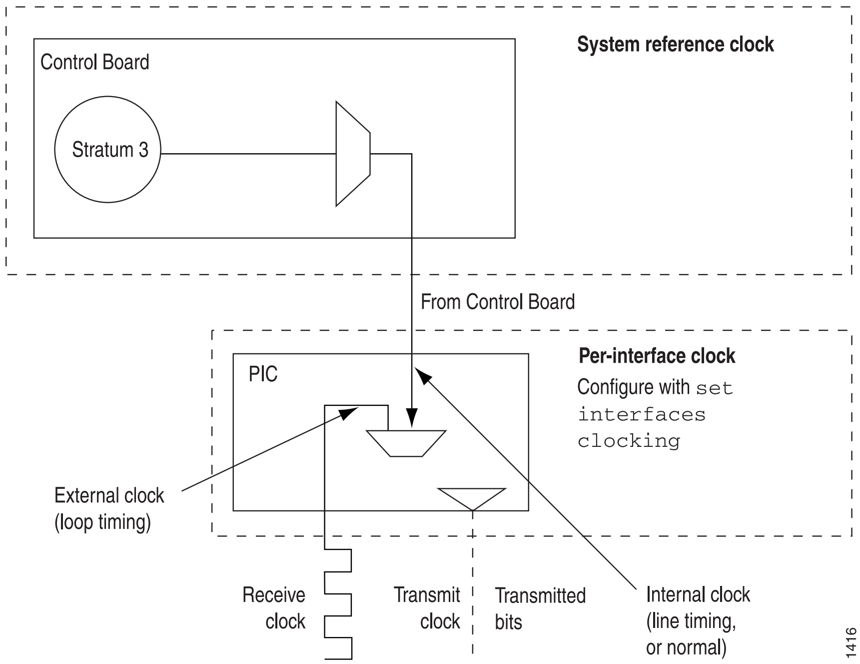
When configuring the router, you can configure the *transmit clock* on each interface; the transmit clock aligns each outgoing packet transmitted over the router's interfaces. For both the router and interfaces, the clock source can be the router's internal Stratum 3 clock, which resides on the control 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 10 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 115.

**Related Documentation**

- Configuring the Junos OS to Support an External Clock Synchronization Interface for M Series and T Series Routers on page 115
- Synchronous Ethernet Overview on page 11
- Configuring an External Clock Synchronization Interface for MX Series Routers on page 116

## 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) 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 10.4, Synchronous Ethernet is supported on MX80, MX240, MX480, and MX960 3D Universal Edge Routers, which deliver synchronization services that meet the requirements of the present-day mobile network, as well as future Long Term Evolution (LTE)–based infrastructures.

Starting with Junos OS Release 11.2, Synchronous Ethernet is supported on the 16-port 10-Gigabit Ethernet MPC (also called the 10-Gigabit Ethernet MPC with SFP+ or the 16x10GE MPC).

16x10GE MPC supports ingress clock monitoring. The 16x10GE MPC does not have a built-in Ethernet equipment clock. Therefore, the 16x10GE MPC can only input a clock signal but cannot be sourced as a clock source. Therefore, the incoming Synchronous Ethernet signals cannot be monitored on the 16x10GE MPC but are monitored by other line cards in the chassis, such as Modular Port Concentrators (MPCs). You can use the 16x10GE MPC for incoming Synchronous Ethernet signals, if at least one other MPC with an Ethernet equipment clock is present in the chassis. This behavior is referred to as *ingress clock monitoring*. Ingress clock monitoring is supported on MX Series routers (excluding MX80 routers, because MX80 routers do not have the 16x10GE MPC).

When an MX Series router is configured for Synchronous Ethernet on the 16x10GE MPC and no other MPC with an Ethernet equipment clock 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.

Starting with Junos OS Release 11.2R4, MX5, MX10, and MX40 3D Universal Edge Routers with model numbers MX5-T, MX10-T, and MX40-T, respectively, support Synchronous Ethernet. Synchronous Ethernet is also now supported on MX80 3D Universal Edge Routers with timing support (MX80-T). On MX240, MX480, and MX960 3D Universal Edge Routers, only the following MPCs support Synchronous Ethernet:

- 30-Gigabit Ethernet Enhanced MPC (MX-MPC1E-3D)
- 30-Gigabit Ethernet Queuing Enhanced MPC (MX-MPC1E-3D-Q)
- 60-Gigabit Ethernet Enhanced MPC (MX-MPC2E-3D)
- 60-Gigabit Ethernet Queuing Enhanced MPC (MX-MPC2E-3D-Q)
- 60-Gigabit Ethernet Enhanced Queuing Enhanced MPC (MX-MPC2E-3D-EQ)

Starting with Junos OS Release 11.4, the 10-Gigabit Ethernet MIC with XFP supports Synchronous Ethernet with both the MIC and the interface configured in LAN framing mode. In LAN mode, the LAN frequency is directly supplied by the MIC's on-board clocking circuitry.

Following are 10-Gigabit Ethernet MIC with XFP interface-level and MIC-level configuration combinations:

- The MIC is configured in LAN-PHY framing mode by configuring all the constituent PICs in the same LAN-PHY framing mode.

### Table 1: LAN-PHY Framing Mode Device Status

| | Synchronous Ethernet Enabled | | Synchronous Ethernet Disabled | |
|---|---|---|---|---|
| | LAN-PHY | WAN-PHY | LAN-PHY | WAN-PHY |
| Device Operation status | Yes | No | Yes | No |
| Device Link status | Yes | No | Yes | No |

- The MIC is alternatively configured in WAN-PHY framing mode by configuring all the constituent PICs in the same WAN-PHY framing mode. This is also applicable for the following configurations:
  - No framing-mode configuration on all the constituent PICs of the MIC.
  - Incompatible framing-mode configuration on constituent PICs of the MIC.
  - No framing-mode configuration on some of the constituent PICs of the MIC.

### Table 2: WAN-PHY Framing Mode Device Status

| | Synchronous Ethernet Enabled | | Synchronous Ethernet Disabled | |
|---|---|---|---|---|
| | LAN-PHY | WAN-PHY | LAN-PHY | WAN-PHY |
| Device Operation status | No | Yes | Yes | No |
| Device Link status | Yes | Yes | Yes | No |

Table 1 on page 12 and Table 2 on page 13 are explained in the following cases and corresponding behaviors:

- 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. For example, the 'request chassis mic... online' command. In this case, the behavior can be presented as:

  - No framing-mode is configured for any or all of the constituent PICs of the MIC. In this case, because WAN mode is the default mode, the MIC is configured to operate in WAN-PHY framing mode.

    In this mode, all the WAN-PHY framing-based interfaces can operate in normal state, as well as providing the necessary Synchronous Ethernet services as required. However, all the LAN-PHY framing-based interfaces cannot provide any of the Synchronous Ethernet services though they can operate normally.

  - All the constituent PICs of a MIC are configured in LAN-PHY mode. In this case, the MIC would be configured to operate in LAN-PHY framing mode.

    In this mode, all the WAN-PHY framing-based interfaces cannot operate in normal state. As a result, these interfaces are administratively brought down. However, the interface when viewed using the **show interfaces** command displays the reason why it is in Admin-Down state though there is no explicit 'disable' configuration command or link-down event. This reason is captured as 'Framing-Conflict'. This indicates that the PIC is configured in LAN-PHY framing-mode and the user needs to configure LAN-PHY as the framing-mode on all the interfaces belonging to the MIC. Because the interfaces are in Admin-Down state anyway, no Synchronous Ethernet services are provided.

    On the other hand, 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:

- The PIC is already online in WAN-PHY framing mode. An interface framing configuration has changed from WAN-PHY to LAN-PHY.

  The interface can continue to be operational for data transceiving purposes. However, it cannot provide any of the Synchronous Ethernet services. For example, it cannot provide a Synchronous Ethernet Standard-compliant clock to downstream entities.

- The PIC is already online in WAN-PHY framing mode. An interface framing configuration has changed from LAN-PHY to WAN-PHY.

  The interface can continue to be operational for data transceiving purposes, and it can also provide a Synchronous Ethernet Standard-compliant clock to downstream entities.

- The PIC is already online in LAN-PHY framing mode. An interface framing configuration has changed from WAN-PHY to LAN-PHY.

  The interface now becomes operational for data transceiving purposes. The Admin Down configuration in the interface and the Synchronous Ethernet Disable flag are removed. The interface can also provide clock to the downstream entities that comply with the Synchronous Ethernet Standard.

- The PIC is already online in LAN-PHY framing mode. An interface framing configuration has changed from LAN-PHY to WAN-PHY.

  The interface is configured in the Admin Down state and the reason for this state is displayed in the show interface command ouput. Because the interface is down, it cannot perform any data operations, nor can it provide any clock to downstream entities.

NOTE:

- MX Series 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 MX Series 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.
- The 10-Gigabit Ethernet MPC with SFP+ does not support Synchronous Ethernet on Junos OS Release 10.4.
- Slot 10 on MX chassis does not support Synchronous Ethernet sources.
- 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.
- RJ-45 ports do not support Synchronous Ethernet.
- 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.

## 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 an External Clock Synchronization Interface for MX Series Routers" on page 116.

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**

- Configuring an External Clock Synchronization Interface for MX Series Routers on page 116
- synchronization
- request chassis synchronization mode
- **show chassis synchronization on page 582**

CHAPTER 3

# Router Chassis Network Services Configuration Overview



## Network Services Mode Overview

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 Access Configuration Guide*.

When configuring chassis network services on the router, 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.
- 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 3 on page 18 explains the different module functions when you configure the router chassis for different network services modes.

### Table 3: 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. |
| 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.<br><br>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.<br><br>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.<br><br>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. |

Table 3: Network Services Mode Functions *(continued)*

| Configuration Upon Boot or Configuration Change | Module Function |
|---|---|
| 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 4 on page 19.

**Related Documentation**

- Firewall Filters and Enhanced Network Services Mode Overview in the *Junos OS Subscriber Access Configuration Guide*.
- Table 4 on page 19

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

Table 4 on page 19 lists Junos OS feature restrictions when running in Ethernet Network Services mode or Enhanced Ethernet Network Services mode.

Table 4: 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.<br>• Data plane support applies only to Ethernet and MPLS.<br>• 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. |

**Related Documentation**

- Network Services Mode Overview on page 17
- Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 76

CHAPTER 4

# TX Matrix and TX Matrix Plus Router Configuration Overview



## TX Matrix Router and T640 Router Configuration Overview

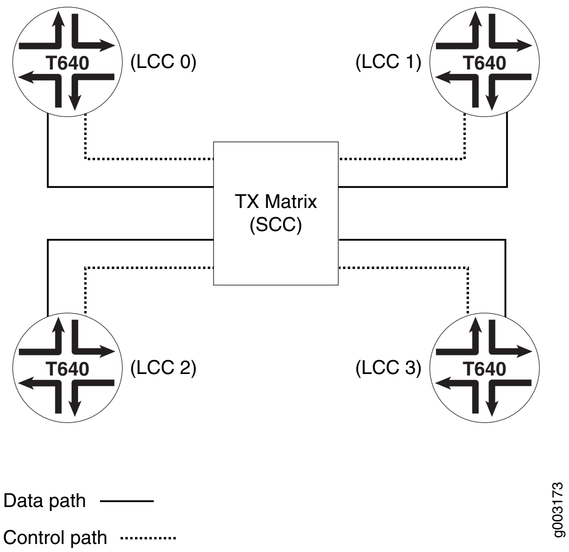
This topic provides an overview of configuring the TX Matrix router and T640 routers.



### 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 22.

### 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 23.

## 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 35

# 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 5 on page 25. You can use the converted FPC number to configure the interfaces on the TX Matrix router in your routing matrix.

### Table 5: 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 35


## TX Matrix Plus Router and T1600 Router Configuration Overview

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

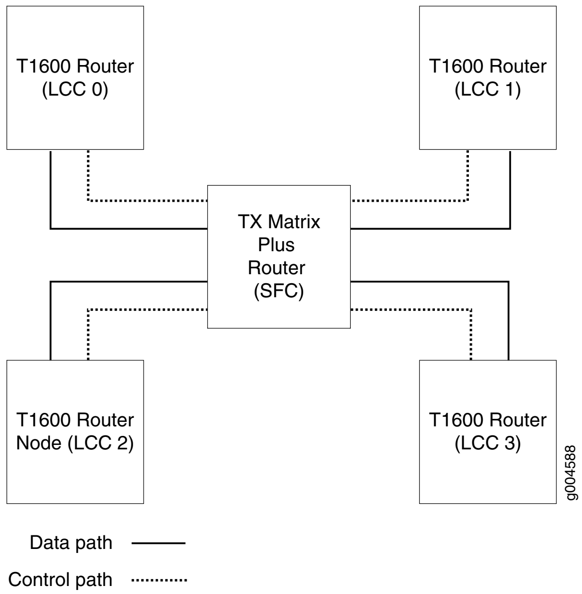


### TX Matrix Plus Router and T1600 Router-Based Routing Matrix Overview

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 27.

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 29.

## 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 Configuration Guide*.

## 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 51
- TX Matrix Plus Router Chassis and Interface Names on page 30
- Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 53


# 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 6 on page 31. You can use the converted FPC number to configure the interfaces on the TX Matrix Plus router in your routing matrix.

### Table 6: 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 26
- Using the Junos OS to Configure a T1600 Router Within a Routing Matrix on page 51
- Configuring the Junos OS to Enable the TX Matrix Plus Router to Generate an Alarm If a T1600 Router Stays Offline on page 52

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 5 on page 25.

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 37.

**Related Documentation**


- TX Matrix Router and T640 Router Configuration Overview on page 21
- TX Matrix Router Chassis and Interface Names on page 24
- Configuring the Junos OS to Upgrade and Downgrade Switch Interface Boards on a TX Matrix Router on page 36
- Configuring the Junos OS to Enable the TX Matrix Router to Generate an Alarm If a T640 Router Stays Offline on page 37


## 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.



### 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**

Use the **request chassis sib (offline | online)** command sequence to power cycle the newly installed 2.0 SIBs.

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 21
- Using the Junos OS to Configure a T640 Router Within a Routing Matrix on page 35


# 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 21
- Using the Junos OS to Configure a T640 Router Within a Routing Matrix on page 35


## 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 40


## 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 on page 40
- Overview on page 40
- Configuration on page 40
- Verification on page 42


### 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 FPC 1 and FPC 2 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 section of the 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 *Junos OS 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
   ```

   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.

3. Configure the routing policy by including the **no-route-localize** statement to enable the forwarding table policy to mark route prefixes such that the routes are installed into forwarding hardware on the FIB-remote Packet Forwarding Engines.

   ```
   [edit policy-options]
   user@R0# set policy-statement fib-policy term a from route-filter 4.4.4.4/32 exact
   user@R0# set policy-statement fib-policy term a then no-route-localize
   user@R0# set policy-statement fib-policy term b from route-filter fec0:4444::4/128
     exact
   user@R0# set policy-statement fib-policy term b then no-route-localize
   user@R0# set policy-statement fib-policy then accept
   ```

**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 42
- Verifying FIB-Localization Configuration on page 43
- Verifying Routes After the Policy Is Applied on page 43


### *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

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 FPC 1 and FPC 2 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 section of the 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 *Junos OS 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
```

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.

3. Configure the routing policy by including the **no-route-localize** statement to enable the forwarding table policy to mark route prefixes such that the routes are installed into forwarding hardware on the FIB-remote Packet Forwarding Engines.

```
[edit policy-options]
user@R0# set policy-statement fib-policy term a from route-filter 4.4.4.4/32 exact
user@R0# set policy-statement fib-policy term a then no-route-localize
```

```
user@R0# set policy-statement fib-policy term b from route-filter fec0:4444::4/128
  exact
user@R0# set policy-statement fib-policy term b then no-route-localize
user@R0# set policy-statement fib-policy then accept
```

**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 47
- Verifying FIB-Localization Configuration on page 48
- Verifying Routes After the Policy Is Applied on page 48

### 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 38
- fib-local on page 44
- fib-remote on page 44
- no-route-localize on page 44
- route-localization on page 45

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 30.

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 52.

**Related Documentation**


- TX Matrix Plus Router and T1600 Router Configuration Overview on page 26
- TX Matrix Plus Router Chassis and Interface Names on page 30
- Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 53


## 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 26
- Using the Junos OS to Configure a T1600 Router Within a Routing Matrix on page 51
- Configuring the Junos OS to Upgrade the T1600 Router Chassis to LCC0 of a TX Matrix Plus Routing Platform on page 53


## 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 54
- Configuring the Junos OS for Upgrading SIBs on the T1600 Router and Connecting It to the SFC on page 54
- Upgrading CBs and Routing Engines of the T1600 Router for Control Plane Connectivity on page 56
- Changing the Management Ethernet Interface Name for the T1600 Router on page 56
- Transferring Control of the T1600 Router (LCC0) to the SFC on page 56
- Adding a New T1600 Router to the TX Matrix Plus Routing Platform on page 57
- Downgrading a T1600 Router from the LCC of a TX Matrix Routing Platform to a Standalone T1600 Router on page 57

## 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 56.
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 54.
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 54.
   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 63.

**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 61
2. Assigning an IP Address to an Interface in the Routing Instance on page 61

## 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 175

## 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 115
- Configuring Port-Mirroring Instances on M120 Routers on page 60

## 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 88
- Configuring the Junos OS to Enable Larger Delay Buffers for T1, E1, and DS0 Interfaces Configured on Channelized IQ PICs on page 90

## 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 59
- Configuring the Junos OS to Support an External Clock Synchronization Interface for M Series and T Series Routers on page 115
- Configuring the Junos OS to Support Eight Queues on IQ Interfaces for T Series and M320 Routers on page 65

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:

NOTE: Port mirroring instances are not supported on MX80 routers. You can, however, configure port mirroring at the global level.


- Configuring Port-Mirroring Instances at the DPC Level on page 68
- Configuring Port-Mirroring Instances at the PIC Level on page 68

## 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 Configuration Guide* 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 171
- family
- hash-key
- inet
- multiservice
- payload
- symmetric-hash

## 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 more information on configuring a full-duplex 10-Gigabit tunnel interface for this MPC, see "Configuring the Junos OS to Support Tunnel Interfaces on MX Series 3D Universal EdgeRouters" on page 75.

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**

- 10-Gigabit Ethernet MPC with SFP+
- *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 71
- Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 76
- Configuring the Junos OS to Support Tunnel Interfaces on MX Series 3D Universal EdgeRouters on page 75


## 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 70
- Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 76
- Configuring the Junos OS to Support Tunnel Interfaces on MX Series 3D Universal EdgeRouters on page 75
- number-of-ports

## 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 70
- Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers on page 76


## 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 System Basics and Services Command Reference*.

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

## Configuring the Junos OS to Support Layer 2 Services on MX Series 3D Universal Edge Routers with MS-DPCs

The Junos OS supports Layer 2 link services on MX Series 3D Universal Edge routers with MS-DPCs and MX-FPCs with non-Ethernet IQE PICs that bundle PPP links from the Type 2 channelized SONET PICs. To enable the Layer 2 service packages such as LSQ interfaces, include the **service-package layer-2** statement at the **[edit chassis fpc *slot-number* pic *pic-number* adaptive-services]** hierarchy level:

```
[edit chassis fpc slot-number pic pic-number adaptive-services]
service-package (layer-2 | layer-3);
```

Configuring the supported link services such as Multilink PPP (MLPPP), Compressed Real-Time Transport Protocol (CRTP), real-time performance monitoring (RPM) is identical to configuring these link services for a multiservices PIC. For more information about Layer 2 link services, see the *Junos OS Services Interfaces Configuration Guide*

**Related Documentation**

- Configuring the Junos OS to Enable Service Packages on Adaptive Services Interfaces on page 113

## 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

## Configuring the Junos OS to Support Tunnel Interfaces on MX Series 3D Universal EdgeRouters

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);
    }
  }
}
```

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

**1g** indicates that 1 Gbps of bandwidth is reserved for tunnel traffic.

**10g** indicates that 10 Gbps 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 173
- Example: Configuring Tunnel Interfaces on a 10-Gigabit Ethernet 4-Port DPC on page 174

## 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 17
- Firewall Filters and Enhanced Network Services Mode Overview in the *Junos OS Subscriber Access Configuration Guide*
- Restrictions on Junos OS Ethernet Network Services Mode and Enhanced Ethernet Network Services Mode Features for MX Series Routers on page 19
- 16-Port 10-Gigabit Ethernet MPC on MX Series Routers (16x10GE 3D MPC) Overview on page 70
- network-services

CHAPTER 9

# 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 78
- Configuring the Junos OS to Disable Power Management on the J Series Chassis on page 79


## 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 78
- Configuring the Junos OS to Disable Power Management on the J Series Chassis on page 79

## 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 78
- Configuring the Junos OS to Support the uPIM Mode on J Series Routers on page 78

## 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 173

CHAPTER 10

# 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 62
- Router Chassis Configuration Statements on page 175


## 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 2 and Type 1 PICs. Each PIC type has three varieties.

Type1 PICs include:

- 4-port OC3
- 2-port OC3
- 1-port OC12

Type 2 PICs include:

- 1-port OC48
- 4-port OC12
- 4-port OC3

The PICs support both 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 Network 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 21
- TX Matrix Plus Router and T1600 Router Configuration Overview on page 26
- Configuring the Junos OS to Enable a SONET PIC to Operate in Channelized (Multiplexed) Mode on page 85

## 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 121
- Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC on page 88
- Configuring the Junos OS to Enable Idle Cell Format and Payload Patterns for ATM Devices on page 122

- atm-cell-relay-accumulation

## 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 85
- Configuring the Junos OS to Support Channelized DS3-to-DS0 Naming for Channel Groups and Time Slots on page 107
- Configuring the Junos OS to Support Channel Groups and Time Slots for Channelized E1 PICs on page 86
- Configuring the Junos OS to Support Channelized STM1 Interface Virtual Tributary Mapping on page 109
- Configuring the Junos OS to Enable Larger Delay Buffers for T1, E1, and DS0 Interfaces Configured on Channelized IQ PICs on page 90

## 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 82
- Configuring the Junos OS to Support the Sparse DLCI Mode on Channelized STM1 or Channelized DS3 PICs on page 84


## 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 7 on page 88 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.

For further information about these interfaces, see the *Junos Network Interfaces Configuration Guide*.

**Related Documentation**

- Ranges for Channelized E1 Interfaces Configuration on page 88

## Ranges for Channelized E1 Interfaces Configuration

Table 7 on page 88 shows the ranges for configuring channel groups and time slots for Channelized E1 Interfaces.

### Table 7: 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 86

## 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 Network Interfaces Configuration Guide*.

**Related Documentation**

- Configuring the Junos OS to Enable ATM2 Intelligent Queuing Layer 2 Circuit Transport Mode on page 121

## 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 90

## 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 89

## 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 8 on page 91.)

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 91

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

Table 8 on page 91 lists the maximum delay buffer that can be configured for T1, E1, and DS0 interfaces configured on Channelized IQ PICs:

### Table 8: 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 |
| 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 |

**Table 8: Maximum Delay Buffer with q-pic-large-buffer Statement Enabled *(continued)***

| Platform, PIC, or Interface Type | Maximum Buffer Size |
| --- | --- |
| 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 90


## 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
- ingress-policer-overhead

## 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) and Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP (MIC-3D-8CHOC3-4CHOC12 and MIC-3D-4CHOC3-2CHOC12).

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, you can configure only the **oc12-stm4** and **oc3-stm1** port speed options.

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 and Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP. 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 or on the Channelized SONET/SDH OC3/STM1 (Multi-Rate) MICs with SFP.

**Related Documentation**

- speed
- no-multi-rate

CHAPTER 11

# 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;
```

**Related Documentation**

- fpc-resync

CHAPTER 12

# Configuring Chassis Settings to Support Aggregated Devices



## Configuring the 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 the 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 configuring 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 **port-priority** statement. Configuring LACP parameters at the chassis level results in all aggregated Ethernet interfaces using these values unless overridden by LACP configuration on a specific interface.

```
[edit chassis]
aggregated-devices {
  ethernet {
    lacp {
      link-protection {
        non-revertive;
      }
      system-priority priority;
    }
  }
}
```

You configure LACP link protection by using the **link-protection** and **system-priority** statements and define port priority at the port level using the **port-priority** statement. Configuring LACP parameters at the chassis level results in all aggregated Ethernet interfaces using the defined configuration unless overridden on a specific interface.

NOTE: LACP link protection also uses port priority. You can configure port priority at the Ethernet interface **[gigether-options]** hierarchy level using the **port-priority** statement. If you choose not to configure port priority, LACP link protection uses the default value for port priority (127). See the *Junos Network Interfaces Configuration Guide* for detailed information about LACP and how to configure it on individual aggregated Ethernet interfaces.

## 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, once 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 to 65535.

CHAPTER 13

# 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**.

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

CHAPTER 14

# 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 9 on page 108 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-number1 ct3 port 0 t1 8]
channel-group 4 timeslots 1-5,10,24;
```

Do not include spaces in the list of time slot numbers.

**Related Documentation**

- Ranges for Channelized DS3-to-DS0 Configuration on page 108

## Ranges for Channelized DS3-to-DS0 Configuration

Table 9 on page 108 shows the ranges for each of the quantities in the preceding configuration.

### Table 9: Ranges for Channelized DS3-to-DS0 Configuration

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

Table 9: 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 107

## 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 84

## 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

CHAPTER 15

# 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 74

CHAPTER 16

# 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 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 86400 seconds. The default value is 90 seconds. For the M120 router, the range for the **validation-interval** option is 30 through 86400 and the default value is **30**.
- Specify the primary external timing source using the **primary (external-a | external-b)** statement.
- Specify the secondary external timing source using the **secondary (external-a | external-b)** statement.

## Configuring an External Clock Synchronization Interface for MX Series Routers

MX80, MX240, MX480, and MX960 routers support external clock synchronization using Synchronous Ethernet. MX80T routers do not support this feature.

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.
- 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.
- 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).
- 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-type (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 synchronization source wait to restore time**

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

```
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>
```

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

**Related Documentation**

- Synchronous Ethernet Overview on page 11
- request chassis synchronization mode
- synchronization (MX Series)
- **show chassis synchronization on page 582**

CHAPTER 17

# 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 88
- Configuring the Junos OS to Enable Idle Cell Format and Payload Patterns for ATM Devices on page 122
- Configuring the Junos OS to Use ATM Cell-Relay Accumulation Mode on an ATM1 PIC on page 84


## 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 only, 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 *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 21. For information about the TX Matrix Plus router, see "TX Matrix Plus Router and T1600 Router Configuration Overview" on page 26.

**Related Documentation**

- Configuring the Junos OS to Use ATM Cell-Relay Accumulation Mode on an ATM1 PIC on page 84
- Configuring the Junos OS to Enable ATM2 Intelligent Queuing Layer 2 Circuit Transport Mode on page 121
- Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC on page 88

CHAPTER 18

# 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**

- Chassis-Level Features, Junos OS Release 11.4

## Traffic Blackholing Caused by Fabric Degradation

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

The T640 and T1600 routers limit the blackhole time by detecting unreachable destination Packet Forwarding Engines and signaling connected routers 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.
- 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 blackholing is attempted. If the healing fails, the system turns off the interfaces, thereby stopping the blackholing.

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.
2. 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, blackholing is limited because no interfaces are created for these FPCs.

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

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

**Related Documentation**


- Disabling FPC Restart on page 128
- Router Chassis Configuration Statements on page 175


## Disabling FPC Restart

You can disable FPC restart to limit recovery actions from a degraded fabric condition to fabric plane restart only. To disable the restarting of FPCs, use the **action-fpc-restart-disable** statement at the **[edit chassis fabric degraded]** hierarchy:

```
[edit chassis fabric]
degraded {
  action-fpc-restart-disable;
}
```

If you disable FPC restart, an alarm indicates whether there are unreachable destinations present in the router because FPC restart is disabled,, and you must ensure to restart the FPCs manually.

To ensure that both the fabric planes 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 Blackholing Caused by Fabric Degradation on page 127
- Router Chassis Configuration Statements on page 175


## 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**—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;
  ```

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** statement is supported only on T Series routers.

**Related Documentation**

- memory-enhanced
- filter
- route
- vpn-label

## 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 OS Services Interfaces Configuration Guide*.

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

## 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
- ingress-policer-overhead

CHAPTER 19

# 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 135
- Silencing External Devices Connected to Alarm Relay Contacts on page 170

CHAPTER 20

# 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 136
- Chassis Conditions That Trigger Alarms on page 137
- Silencing External Devices Connected to Alarm Relay Contacts on page 170

## System-Wide Alarms and Alarms for Each Interface Type

Table 10 on page 136 lists the system-wide alarms and the alarms for each interface type.

### Table 10: 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 10: 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 135

## Chassis Conditions That Trigger Alarms

Various conditions related to the chassis components trigger yellow and red alarms. You cannot configure these conditions. Table 11 on page 138 through "Chassis Component Alarm Conditions on M5 and M10 Routers" on page 138 list the alarms that the chassis components can generate. For information about chassis alarms for J Series Services Routers, see the *J Series Services Router Administration Guide*. For information about chassis alarms for the TX Matrix router, see the *TX Matrix Router Hardware Guide*. For information about chassis alarms for the TX Matrix Plus router, see the *TX Matrix Plus Router Hardware Guide*

## Chassis Component Alarm Conditions on M5 and M10 Routers

Table 11 on page 138 lists the alarms that the chassis components can generate on M5 and M10 routers.

### Table 11: 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 |
| 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 11: 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 |
| 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 11: 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• Check fan. | Red |
| | The temperature sensor has failed. | Open a support case using the Case Manager link at<br><br>**www.juniper.net/**<br><br>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 12 on page 141 lists the alarms that the chassis components can generate on M7i and M10i routers.

## Table 12: 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 |
| 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 12: 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 |
| Routing Engine | Excessive framing errors on console port.<br><br>An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded.<br><br>This might be caused by a faulty serial console port cable connected to the device. | Replace the serial cable connected to the device.<br><br>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 |

Table 12: Chassis Component Alarm Conditions on M7i and M10i Routers *(continued)*

| Chassis Component | Alarm Condition | Remedy | Alarm Severity |
|---|---|---|---|
| Temperature | The chassis temperature has exceeded 55 degrees C (131 degrees F), the fans have been turned on to full speed, and one or more fans have failed. | • Check room temperature.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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 13 on page 144 lists the alarms that the chassis components can generate on M20 routers.

## Table 13: 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 13: Chassis Component Alarm Conditions on M20 Routers *(continued)*

| Chassis Component | Alarm Condition | Remedy | Alarm Severity |
|---|---|---|---|
| Routing Engine | Excessive framing errors on console port.<br><br>An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded.<br><br>This might be caused by a faulty serial console port cable connected to the device. | Replace the serial cable connected to the device.<br><br>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 |
| 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 13: Chassis Component Alarm Conditions on M20 Routers *(continued)*

| Chassis Component | Alarm Condition | Remedy | Alarm Severity |
|---|---|---|---|
| SSB | The control board has failed. If this occurs, the board attempts to reboot. | Replace failed control board. | Red |
| 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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 14 on page 147 lists the alarms that the chassis components can generate on M40 routers.

### Table 14: Chassis Component Alarm Conditions on M40 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 |
| 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 14: 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 14: Chassis Component Alarm Conditions on M40 Routers *(continued)*

| Chassis Component | Alarm Condition | Remedy | Alarm Severity |
|---|---|---|---|
| Routing Engine | Excessive framing errors on console port.<br><br>An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded.<br><br>This might be caused by a faulty serial console port cable connected to the device. | Replace the serial cable connected to the device.<br><br>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 |
| SCB | The System Control Board (SCB) has failed. If this occurs, the board attempts to reboot. | Replace failed SCB. | Red |

Table 14: 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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 15 on page 151 lists the alarms that the chassis components can generate on M40e and M160 routers.

## Table 15: 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 15: 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 15: 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.<br><br>An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded.<br><br>This might be caused by a faulty serial console port cable connected to the device. | Replace the serial cable connected to the device.<br><br>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 |
| 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 15: Chassis Component Alarm Conditions on M40e and M160 Routers *(continued)*

| Chassis Component | Alarm Condition | Remedy | Alarm Severity |
|---|---|---|---|
| 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 15: 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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 16 on page 155 lists the alarms that the chassis components can generate on M120 routers.

### Table 16: Chassis Component Alarm Conditions on M120 Routers

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

Table 16: 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 16: 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 16: Chassis Component Alarm Conditions on M120 Routers *(continued)*

| Chassis Component | Alarm Condition | Remedy | Alarm Severity |
|---|---|---|---|
| Routing Engine | Excessive framing errors on console port.<br><br>An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded.<br><br>This might be caused by a faulty serial console port cable connected to the device. | Replace the serial cable connected to the device.<br><br>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 |

Table 16: 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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 17 on page 160 lists the alarms that the chassis components can generate on M320 routers.

### Table 17: 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 17: 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 17: Chassis Component Alarm Conditions on M320 Routers *(continued)*

| Chassis Component | Alarm Condition | Remedy | Alarm Severity |
|---|---|---|---|
| Routing Engine | Excessive framing errors on console port.<br><br>An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded.<br><br>This might be caused by a faulty serial console port cable connected to the device. | Replace the serial cable connected to the device.<br><br>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 |

### Table 17: Chassis Component Alarm Conditions on M320 Routers *(continued)*

| Chassis Component | Alarm Condition | Remedy | Alarm Severity |
|---|---|---|---|
| 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• Check fan. | Yellow |

### Table 17: 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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 18 on page 164 lists the alarms that the chassis components can generate on MX Series 3D Universal Edge routers.

### Table 18: 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 18: 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 18: 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 18: 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.<br><br>An excessive framing error alarm is triggered when the default framing error threshold of 20 errors per second on a serial port is exceeded.<br><br>This might be caused by a faulty serial console port cable connected to the device. | Replace the serial cable connected to the device.<br><br>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 |
| 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 18: 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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.<br>• Check air filter and replace it.<br>• Check airflow.<br>• 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 TX Matrix and TX Matrix Plus Routers

For information about chassis component alarms on the TX Matrix and TX Matrix Plus routers, see the *TX Matrix Router Hardware Guide* and the *TX Matrix Plus Router Hardware Guide*, respectively.

## 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 19 on page 169 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 19: 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**) on the backup Routing Engine is down. | • Check the interface cable connection.<br>• Reboot the system.<br>• 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 19: 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.<br>• If the alarm recurs, open a support case using the Case Manager link at **www.juniper.net/support/** or<br>call 1-888-314-JTAC<br>(within the United States) or 1-408-745-9500 (from outside the United States) | Yellow |

**Related Documentation**

- Configuring the Junos OS to Determine Conditions That Trigger Alarms on Different Interface Types on page 135
- Silencing External Devices Connected to Alarm Relay Contacts on page 170

## 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 135
- Configuring the Junos OS to Disable the Physical Operation of the Craft Interface on page 133

CHAPTER 21

# 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 68

## 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 Tunnel Interfaces on MX Series 3D Universal EdgeRouters on page 75
- Configuring the Junos OS to Support ILMI for Cell Relay Encapsulation on an ATM2 IQ PIC on page 88

## 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 79

## 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**

- Configuring the Junos OS to Support Tunnel Interfaces on MX Series 3D Universal EdgeRouters on page 75
- Example: Configuring Tunnel Interfaces on a Gigabit Ethernet 40-Port DPC on page 173

CHAPTER 22

# 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;
  }
}
feb
  slot number
    ucode-imem-remap
  {
}
fpc slot-number {
  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 {
        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;
      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;
            }
          }
        }
      }
    }
  }
  maximum-ecmp;
  offline;
  online-expected;
  sampling-instance;
}
memory-enhanced{
  filter;
  route;
  vpn-label;
}
(packet-scheduling | no-packet-scheduling);
pem {
  minimum number;
}
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 21 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 26 and the *TX Matrix Plus Router Hardware Guide*.

**Related Documentation**

- Chassis Configuration Statements on page 179

## Chassis Configuration Statements

The following table lists the router chassis configuration statements available at the **[edit chassis]** hierarchy level.

| A-D | E-I | J-O | P-R | S-Z |
| --- | --- | --- | --- | --- |
| action-fpc-restart-disable | e1 | lacp | packet-scheduling | sampling-instance |
| adaptive-services | egress-policer-overhead | lcc | payload | service-package |
| aggregate-ports | ethernet (Chassis) | linerate-mode | pem | session-offload |
| aggregated-devices | fabric upgrade-mode | link-protection | pic (M Series, MX Series, and T Series Routers) | sfm |
| alarm | family | maximum-ecmp | pic (TX Matrix and TX Matrix Plus Routers) | sib |

| A-D | E-I | J-O | P-R | S-Z |
|---|---|---|---|---|
| atm-cell-relay-accumulation | fib-local | max-queues-per-interface | port | sonet |
| atm-l2circuit-mode | fib-remote | memory-enhanced | power | sparse-dlcis |
| bandwidth | filter | mlfr-uni-nni-bundles | q-pic-large-buffer | speed |
| ce1 | fpc (M320, T320, T640 Routers) | multiservice | red-buffer-occupancy | symmetric-hash |
| channel-group | fpc (MX Series 3D Universal Edge Routers) | network-services | route | synchronization (M Series, T Series) |
| channelization | fpc (TX Matrix and TX Matrix Plus Routers) | no-concatenate | routing-engine | synchronization (MX Series) |
| chassis | fpc-feb-connectivity | no-multi-rate | route-localization | system-priority |
| config-button | fpc-resync | non-revertive | | t1 |
| craft-lockout | framing | number-of-ports | | traffic-manager |
| ct3 | fru-poweron-sequence | offline | | tunnel-services |
| device-count | hash-key | on-disk-failure | | ucode-imem-remap |
| disk-failure-action | idle-cell-format | online-expected | | vpn-label |
| dynamic-profile-options | inet | | | vrf-mtu-check |
| | ingress-policer-overhead | | | vtmapping |

**Related Documentation**

- Router Chassis Configuration Statements on page 175

PART 3

# Administration

CHAPTER 23

# 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 (QFX Series)** 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 QFX Series 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 switches only) (Optional) On a QFabric switch, 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 switches only) (Optional) On a QFabric switch, 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 220
- show chassis craft-interface

**List of Sample Output** clear chassis display message on page 185

**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 Switch)** request chassis cb (offline | online)interconnect-device *name* slot *slot-number* <interconnect-device *name* slot *slot-number*)>

**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 the QFX Series.

**Description** (M120, M320, and MX Series routers and T Series routers, the QFX Series, 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.

online—Bring the Control Board online.

interconnect-device *name*—(QFabric switches only) (Optional) Bring the 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.
- 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 Switch—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

**List of Sample Output** 

request chassis cb on page 187
request chassis cb interconnect-device (QFabric Switch) on page 187

**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 Switch)**

```
user@switch> request chassis cb interconnect-device interconnect1 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 229

**List of Sample Output** request chassis cfeb on page 188

**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

**List of Sample Output** request chassis cip offline slot (TX Matrix Plus Router) on page 189
request chassis cip offline slot (TX Matrix Plus Router) on page 189

**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.

**Description** (M120 and MX Series routers and EX8200 switches only) 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 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

**List of Sample Output**
request chassis fabric plane 0 online on page 190
request chassis fabric plane 0 offline on page 190
request chassis fabric plane 0 online (EX8200 switch) on page 190

**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 feb

**Syntax** request chassis feb (offline | online | restart) slot *slot-number*

**Release Information** Command introduced in Junos OS Release 8.0.

**Description** (M120 router only) Control the operation of the specified Forwarding Engine Board (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

**List of Sample Output**
request chassis feb offline slot 0 on page 191
request chassis feb online slot 0 on page 191
request chassis feb restart slot 0 on page 191

**Output Fields** When you enter this command, you are provided feedback on the status of your request.

### Sample Output

**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 chassi 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 fpc

**Syntax** request chassis fpc (offline | online | restart) slot *slot-number*

**Syntax (TX Matrix and TX Matrix Plus Router)** request chassis fpc (offline | online | restart) slot *slot-number*
<lcc *number*>

**Syntax (MX Series Router)** request chassis fpc (offline | online | restart) slot *slot-number*
<all-members>
<local>
<member *member-id*>

**Syntax (QFX Series)** 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)>

**Release Information** Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches that have multiple FPCs.
Command introduced in Junos OS 11.3 for the QFX Series.

**Description** (M20, M40, M40e, M120, M160, M320, MX Series, and T Series routers and EX Series 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*—Bring the Flexible Port Concentrator (FPC) on the Interconnect device either offline or online:

- (QFabric Switch) On a QFabric switch, specify the name of the 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.
- 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 Switch —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 (switch's member ID).
  - EX6210 switches—Replace ***slot-number*** with a value from 0 through 3, or 6 through 9 (line card).

    NOTE: **These commands are not supported for slot 4 and 5 in EX6210 switches which are the slots for Switch Fabric and Routing Engine (SRE) modules.**
  - 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).

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 446

**List of Sample Output** request chassis fpc on page 194

**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 fpm resync

**Syntax** request chassis fpm resync

**Syntax (TX Matrix Router)** request chassis fpm resync (lcc *number* | scc)

**Syntax (TX Matrix Plus Router)** request chassis fpm resync (lcc *number* | sfc *number*)

**Syntax (MX Series Router)** request chassis fpm resync
<all-members>
<local>
<member *member-id*>

**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** (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

**List of Sample Output** request chassis fpm resync on page 196

**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 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 517

**List of Sample Output**

request chassis lcc on page 197

**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

**List of Sample Output** request chassis mcs on page 198

**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.

**Description** (MX Series routers only) Control the operation of the Modular Interface Cards (MICs) installed on a Modular Port Concentrator (MPC).

**Options** offline—Take the MIC offline.

online—Bring the MIC online.

fpc-slot *slot-number*—FPC slot number where the MIC is installed:

- 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**.

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 464

**List of Sample Output** request chassis mic online on page 199

**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 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

**List of Sample Output** request chassis pcg on page 200

**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 (TX Matrix and TX Matrix Plus Router)** 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.

**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:

- 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, and 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 464
- show chassis pic on page 527

**List of Sample Output** request chassis pic on page 203

**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

**List of Sample Output**
request chassis redundancy feb slot 2 switch-to-backup on page 204
request chassis redundancy feb slot 3 revert-to-backup on page 204

**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 Router)**

request chassis routing-engine master (acquire | release | switch) (lcc *number* |
scc | all-chassis)
<force>
<no-confirm>

**Syntax (TX Matrix Plus Router)**

request chassis routing-engine master (acquire | release | switch) (lcc *number* |
sfc | all-chassis | all-lcc)
<force>
<no-confirm>

**Syntax (MX Series Router)**

request chassis routing-engine master (acquire | release | switch)
<all-members>
<force>
<local>
<member *member-id*>
<no-confirm>

**Syntax (QFX Series)**

request chassis routing-engine master (acquire | 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 the QFX Series.

**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.

**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.

interconnect-device *name*—(QFabric switches 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 switches 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 548

**List of Sample Output**

request chassis routing-engine master acquire on page 207
request chassis routing-engine master switch on page 208

**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 318

**List of Sample Output** request chassis scg on page 209

**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 562

**List of Sample Output**

request chassis sfm master switch on page 210
request chassis sfm master switch no-confirm on page 210

**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 562

**List of Sample Output**

request chassis sfm (M40e) on page 211
request chassis sfm (M160) on page 211

**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 (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-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 565

**List of Sample Output**

request chassis sib on page 213
request chassis sib on page 213

**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 215


**List of Sample Output** request chassis sib f13 train-link-receive slot on page 214

**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 214

**List of Sample Output** request chassis sib f13 train-link-transmit slot on page 215

**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 217

**List of Sample Output** request chassis sib train-link-receive slot on page 216

**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 216


**List of Sample Output** request chassis sib train-link-transmit slot on page 217

**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.

**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 571
- show chassis spmb sibs on page 578

**List of Sample Output** request chassis spmb restart on page 218

**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 synchronization switch

**Syntax** request chassis synchronization switch (external-a | external-b)

**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.

**Description** (M320, M40e, M120, T320, T640, and T1600 routers only) Change the external clock source used for chassis synchronization.

**Options** external-a—(Routing matrix only) Change the synchronization source to external source A.

external-b—(Routing matrix only) Change the synchronization source to external source B.

**Required Privilege Level** maintenance

**Related Documentation**

- show chassis synchronization on page 582

**List of Sample Output** request chassis synchronization switch external-a on page 219

**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 external-a**

```
user@host> request chassis synchronization switch external-a
switching to external-a, 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>

**Syntax (QFX Series)**
set chassis display message "*message*"

**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.
Command introduced in Junos OS Release 11.1 for the QFX Series.

**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, 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**
"*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 184
- show chassis craft-interface

**List of Sample Output**

set chassis display message (Creating) on page 221
set chassis display message (Deleting) on page 221
set chassis display message (QFX Series) on page 222

**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      |
     +--------------------+
```

### set chassis display message (QFX Series)

```
user@switch> set chassis display message
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 24

# Monitoring Commands

## show chassis alarms

**Syntax**

show chassis alarms

**Syntax (TX Matrix Router)**

show chassis alarms
<lcc *number* | scc>

**Syntax (TX Matrix Plus Router)**

show chassis alarms
<lcc *number* | sfc *number*>

**Syntax (MX Series Router)**

show chassis alarms
<all-members>
<local>
<member *member-id*>

**Syntax (QFX Series)**

show chassis alarms
<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 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.

**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 switches 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 switches 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.

**Required Privilege Level** view

**List of Sample Output**

show chassis alarms (Alarms Active) on page 226
show chassis alarms (No Alarms Active) on page 226
show chassis alarms (Fan Tray) on page 226
show chassis alarms (Unreachable Destinations Present on a T Series Router) on page 226
show chassis alarms (FPC Offline Due to Unreachable Destinations on a T Series Router) on page 226
show chassis alarms (SCG Absent on a T Series Router) on page 227
show chassis alarms (Alarms Active on a TX Matrix Router) on page 227
show chassis alarms (Backup Routing Engine) on page 227
show chassis alarms (Alarms Active on the QFX Series) on page 227
show chassis alarms node-device (Alarms Active on the QFabric Switch) on page 227
show chassis alarms (Alarms Active on the QFabric Switch) on page 227
show chassis alarms (Alarms Active on an EX8200 Switch) on page 228

**Output Fields** Table 20 on page 225 lists the output fields for the **show chassis alarms** command. Output fields are listed in the approximate order in which they appear.

### Table 20: show chassis alarms Output Fields

| Field Name | Field Description |
| --- | --- |
| **Alarm time** | Date and time the alarm was first recorded. |

Table 20: show chassis alarms Output Fields *(continued)*

| Field Name | Field Description |
|---|---|
| **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 (Unreachable Destinations Present on a T Series Router)**

```
user@host> show chassis alarms
10 alarms currently active
Alarm time               Class  Description
2011-08-30 18:43:53 PDT  Major  FPC 7 has unreachable destinations
2011-08-30 18:43:53 PDT  Major  FPC 5 has unreachable destinations
2011-08-30 18:43:52 PDT  Major  FPC 3 has unreachable destinations
2011-08-30 18:43:52 PDT  Major  FPC 2 has unreachable destinations
2011-08-30 18:43:52 PDT  Minor  SIB 0 Not Online
2011-08-30 18:43:33 PDT  Minor  SIB 4 Not Online
2011-08-30 18:43:28 PDT  Minor  SIB 3 Not Online
2011-08-30 18:43:05 PDT  Minor  SIB 2 Not Online
2011-08-30 18:43:28 PDT  Minor  SIB 1 Not Online
2011-08-30 18:43:05 PDT  Major  PEM 1 Not Ok
```

**show chassis alarms (FPC Offline Due to Unreachable Destinations on a T Series Router)**

```
user@host> show chassis alarms
10 alarms currently active
Alarm time               Class  Description
2011-08-30 18:43:53 PDT  Major  FPC 7 offline due to unreachable destinations
2011-08-30 18:43:53 PDT  Major  FPC 5 offline due to unreachable destinations
2011-08-30 18:43:52 PDT  Major  FPC 3 offline due to unreachable destinations
2011-08-30 18:43:52 PDT  Major  FPC 2 offline due to unreachable destinations
2011-08-30 18:43:52 PDT  Minor  SIB 0 Not Online
2011-08-30 18:43:33 PDT  Minor  SIB 4 Not Online
2011-08-30 18:43:28 PDT  Minor  SIB 3 Not Online
2011-08-30 18:43:05 PDT  Minor  SIB 2 Not Online
2011-08-30 18:43:28 PDT  Minor  SIB 1 Not Online
2011-08-30 18:43:05 PDT  Major  PEM 1 Not Ok
```

**show chassis alarms (SCG Absent on a T Series Router)**

```
user@host> show chassis alarms
4 alarms currently active
Alarm time              Class  Description
2011-01-23 21:42:46 PST  Major  SCG 0 NO EXT CLK MEAS-BKUP SCG ABS
```

**show chassis alarms (Alarms Active on a TX Matrix Router)**

```
user@host> show chassis alarms
scc-re0:
--------------------------------------------------------------------------
8 alarms currently active
Alarm time              Class  Description
2004-08-05 18:43:53 PDT  Minor  LCC 0 Minor Errors
2004-08-05 18:43:53 PDT  Minor  SIB 3 Not Online
2004-08-05 18:43:52 PDT  Major  SIB 2 Absent
2004-08-05 18:43:52 PDT  Major  SIB 1 Absent
2004-08-05 18:43:52 PDT  Major  SIB 0 Absent
2004-08-05 18:43:33 PDT  Major  LCC 2 Major Errors
2004-08-05 18:43:28 PDT  Major  LCC 0 Major Errors
2004-08-05 18:43:05 PDT  Minor  LCC 2 Minor Errors
lcc0-re0:
--------------------------------------------------------------------------
5 alarms currently active
Alarm time              Class  Description
2004-08-05 18:43:53 PDT  Minor  SIB 3 Not Online
2004-08-05 18:43:49 PDT  Major  SIB 2 Absent
2004-08-05 18:43:49 PDT  Major  SIB 1 Absent
2004-08-05 18:43:49 PDT  Major  SIB 0 Absent
2004-08-05 18:43:28 PDT  Major  PEM 0 Not OK
lcc2-re0:
--------------------------------------------------------------------------
5 alarms currently active
Alarm time              Class  Description
2004-08-05 18:43:35 PDT  Minor  SIB 3 Not Online
2004-08-05 18:43:33 PDT  Major  SIB 2 Absent
2004-08-05 18:43:33 PDT  Major  SIB 1 Absent
2004-08-05 18:43:33 PDT  Major  SIB 0 Absent
2004-08-05 18:43:05 PDT  Minor  PEM 1 Absent
```

**show chassis alarms (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
2011-11-24 07:45:01 PST  Major  FPC 0 Fan 1 not spinning
```

**show chassis alarms node-device (Alarms Active on the QFabric Switch)**

```
user@switch> show chassis alarms node-device ED3691
node-device ED3694
3 alarms currently active
Alarm time              Class  Description
2011-08-24 16:04:15 UTC  Major  ED3694:fte-0/1/2: Link down
2011-08-24 16:04:14 UTC  Major  ED3694:fte-0/1/0: Link down
2011-08-24 14:21:14 UTC  Major  ED3694 PEM 0 is not supported/powered
```

**show chassis alarms (Alarms Active on the QFabric Switch)**

```
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 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 188

**List of Sample Output**

show chassis cfeb (M7i) on page 230
show chassis cfeb (M10i) on page 230

**Output Fields** Table 21 on page 229 lists the output fields for the **show chassis cfeb** command. Output fields are listed in the approximate order in which they appear.

### Table 21: show chassis cfeb Output Fields

| Field Name | Field Description |
|---|---|
| **State** | Status of the CFEB:<br>• **Online**—CFEB is online and running.<br>• **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. |
| **Internet Processor II** | Information about the CFEB processor. |

### Table 21: show chassis cfeb Output Fields *(continued)*

| Field Name | Field Description |
|---|---|
| **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 189

**Output Fields**

Table 22 on page 231 lists the output fields for the **show chassis cip** command. Output fields are listed in the approximate order in which they appear.

### Table 22: 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:<br>• 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.<br>NOTE: The current configuration of the routing matrix based on a TX Matrix Plus router supports only one SFC.<br>• Port numbers **0** to **15** on Ethernet switch **1** can be used to connect up to 16 LCCs.<br>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**. |
| **Type** | Type of CIP:<br>• **XE**—Ethernet switch **0** ports used for connections to the SFC control plane or other devices such as JCS1200.<br>• **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**. |

Table 22: show chassis cip Output Fields *(continued)*

| Field Name | Field Description |
|---|---|
| **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 (TX Matrix Router)**

show chassis environment
<lcc *number* | scc>

**Syntax (TX Matrix Plus Router)**

show chassis environment
<lcc *number* | sfc *number*>

**Syntax (MX Series Router)**

show chassis environment
<all-members>
<local>
<member *member-id*>

**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 *nameslot-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 the QFX Series.

**Description**

Display environmental information about the router or switch chassis, including the temperature and information about the fans, power supplies, and Routing Engine.

**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 only) (Optional) Display chassis environmental information for all the members of the Virtual Chassis configuration.

cb interconnect-device *name*—(QFabric switches only) (Optional) Display chassis environmental information for the Control Board on an Interconnect device.

fpc *fpc-slot*—(QFX3500 switches and QFabric Switches) (Optional) On the QFX3500 switch, display chassis environmental information for a specified Flexible PIC Concentrator. Replace ***slot-number*** with **0**. On a QFabric switch, display chassis environment information for a specified Flexible PIC Concentrator on an Interconnect device.

interconnect-device *name*—(QFabric switches 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 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 only) (Optional) Display chassis environmental information for the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display chassis environmental information for the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

node-device *name*—(QFabric switches only) (Optional) Display chassis environmental information for the Node device.

pem—(QFX3500 switches and QFabric Switches) (Optional) Display chassis environmental information for the Power Entry Module on the specified Interconnect device or Node device.

routing-engine—(QFX3500 switches and QFabric Switches) (Optional) Display chassis environmental information for the Routing Engine on the specified Interconnect device.

scc—(TX Matrix routers only) (Optional) Display chassis environmental information about the TX Matrix router (or switch-card chassis).

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**.

**Required Privilege Level**

view

**Related Documentation**


- show chassis environment cb on page 255
- show chassis environment cip
- show chassis environment fpc on page 268
- show chassis environment fpm on page 279
- show chassis environment mcs on page 283
- show chassis environment pcg on page 307
- show chassis environment pem on page 309
- show chassis environment routing-engine on page 315


**List of Sample Output**

show chassis environment (J2300 Router) on page 236
show chassis environment (J4300 or J6300 Router) on page 236
show chassis environment (M5 Router) on page 236

**Output Fields** Table 23 on page 235 lists the output fields for the **show chassis environment** command. Output fields are listed in the approximate order in which they appear.

### Table 23: show chassis environment Output Fields

| Field Name | Field Description |
| --- | --- |
| **Power** | Power information:<br>• (M5, M10, M20, and M40 routers and EX Series switches only) Power supply status: **OK**, **Testing**, (during initial power-on), **Failed**, or **Absent**.<br>• (M7i, M10i, M40e, M120, M160, M320, T Series routers and EX Series switches only) Power Entry Modules status: **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). |
| **Fan** | Fan status: **OK**, **Testing** (during initial power-on), **Failed**, or **Absent**. **Measurement** indicates if fans are spinning at normal or high speed. |
| **Misc** | Information about other components of the chassis:<br>• On some routers, this field indicates the status of one or more additional components.<br>• On the M160 router, **Misc** includes **CIP** (Connector Interface Panel). **OK** indicates the CIP is present.<br>• On the T640 router, **Misc** includes **CIP** and **SPMB** (Switch Processor Mezzanine Board). **OK** indicates the item is present. |

## 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
```

**show chassis environment (M40 Router)**

user@host> **show chassis environment**

```
Class Item                  Status     Measurement
Power Power Supply A        OK
      Power Supply B        Absent
Temp  FPC 3                 OK         24 degrees C / 75 degrees F
```

```
      FPC 6                 OK         26 degrees C / 78 degrees F
      SCB                   OK         26 degrees C / 78 degrees F
      Backplane @ A1        OK         28 degrees C / 82 degrees F
      Backplane @ A2        OK         23 degrees C / 73 degrees F
      Routing Engine        OK         26 degrees C / 78 degrees F
Fans  Top Impeller          OK         Spinning at normal speed
      Bottom impeller       OK         Spinning at normal speed
      Rear Left Fan         OK         Spinning at normal speed
      Rear Center Fan       OK         Spinning at normal speed
      Rear Right Fan        OK         Spinning at normal speed
Misc  Craft Interface       OK
```

### show chassis environment (M40e Router)

```
user@host> show chassis environment
Class Item                  Status     Measurement
Power PEM 0                 OK
      PEM 1                 Absent
Temp  PCG 0                 OK         44 degrees C / 111 degrees F
      PCG 1                 OK         47 degrees C / 116 degrees F
      Routing Engine 0      OK         40 degrees C / 104 degrees F
      Routing Engine 1      OK         37 degrees C / 98 degrees F
      MCS 0                 OK         45 degrees C / 113 degrees F
      MCS 1                 OK         42 degrees C / 107 degrees F
      SFM 0 SPP             OK         40 degrees C / 104 degrees F
      SFM 0 SPR             OK         44 degrees C / 111 degrees F
      SFM 1 SPP             OK         43 degrees C / 109 degrees F
      SFM 1 SPR             OK         45 degrees C / 113 degrees F
      FPC 0                 OK         38 degrees C / 100 degrees F
      FPC 1                 OK         40 degrees C / 104 degrees F
      FPC 2                 OK         38 degrees C / 100 degrees F
      FPC 4                 OK         34 degrees C / 93 degrees F
      FPC 5                 OK         43 degrees C / 109 degrees F
      FPC 6                 OK         41 degrees C / 105 degrees F
      FPC 7                 OK         43 degrees C / 109 degrees F
      FPM CMB               OK         28 degrees C / 82 degrees F
      FPM Display           OK         28 degrees C / 82 degrees F
Fans  Rear Bottom Blower    OK         Spinning at normal speed
      Rear Top Blower       OK         Spinning at normal speed
      Front Top Blower      OK         Spinning at normal speed
      Fan Tray Rear Left    OK         Spinning at normal speed
      Fan Tray Rear Right   OK         Spinning at normal speed
      Fan Tray Front Left   OK         Spinning at normal speed
      Fan Tray Front Right  OK         Spinning at normal speed
Misc  CIP                   OK
```

### show chassis environment (M120 Router)

```
user@host> show chassis environment
Class Item                          Status     Measurement
Temp  PEM 0                         OK
      PEM 1                         OK
      Routing Engine 0              OK         43 degrees C / 109 degrees F
      Routing Engine 1              OK         44 degrees C / 111 degrees F
      CB 0 Intake                   OK         33 degrees C / 91 degrees F
      CB 0 Exhaust A                OK         36 degrees C / 96 degrees F
      CB 0 Exhaust B                OK         35 degrees C / 95 degrees F
      CB 1 Intake                   OK         34 degrees C / 93 degrees F
      CB 1 Exhaust A                OK         38 degrees C / 100 degrees F
      CB 1 Exhaust B                OK         35 degrees C / 95 degrees F
      FEB 3 Intake                  OK         35 degrees C / 95 degrees F
      FEB 3 Exhaust A               OK         37 degrees C / 98 degrees F
      FEB 3 Exhaust B               OK         39 degrees C / 102 degrees F
```

```
        FEB 4 Intake                   OK         33 degrees C / 91 degrees F
        FEB 4 Exhaust A                OK         39 degrees C / 102 degrees F
        FEB 4 Exhaust B                OK         36 degrees C / 96 degrees F
        FPC 2 Exhaust A                OK         32 degrees C / 89 degrees F
        FPC 2 Exhaust B                OK         31 degrees C / 87 degrees F
        FPC 3 Exhaust A                OK         32 degrees C / 89 degrees F
        FPC 3 Exhaust B                OK         33 degrees C / 91 degrees F
        FPC 4 Exhaust A                OK         32 degrees C / 89 degrees F
        FPC 4 Exhaust B                OK         30 degrees C / 86 degrees F
  Fans  Front Top Tray Fan 1           OK         Spinning at normal speed
        Front Top Tray Fan 2           OK         Spinning at normal speed
        Front Top Tray Fan 3           OK         Spinning at normal speed
        Front Top Tray Fan 4           OK         Spinning at normal speed
        Front Top Tray Fan 5           OK         Spinning at normal speed
        Front Top Tray Fan 6           OK         Spinning at normal speed
        Front Top Tray Fan 7           OK         Spinning at normal speed
        Front Top Tray Fan 8           OK         Spinning at normal speed
        Front Bottom Tray Fan 1        OK         Spinning at normal speed
        Front Bottom Tray Fan 2        OK         Spinning at normal speed
        Front Bottom Tray Fan 3        OK         Spinning at normal speed
        Front Bottom Tray Fan 4        OK         Spinning at normal speed
        Front Bottom Tray Fan 5        OK         Spinning at normal speed
        Front Bottom Tray Fan 6        OK         Spinning at normal speed
        Front Bottom Tray Fan 7        OK         Spinning at normal speed
        Front Bottom Tray Fan 8        OK         Spinning at normal speed
        Rear Top Tray Fan 1            OK         Spinning at normal speed
        Rear Top Tray Fan 2            OK         Spinning at normal speed
        Rear Top Tray Fan 3            OK         Spinning at normal speed
        Rear Top Tray Fan 4            OK         Spinning at normal speed
        Rear Top Tray Fan 5            OK         Spinning at normal speed
        Rear Top Tray Fan 6            OK         Spinning at normal speed
        Rear Top Tray Fan 7            OK         Spinning at normal speed
        Rear Top Tray Fan 8            OK         Spinning at normal speed
        Rear Bottom Tray Fan 1         OK         Spinning at normal speed
        Rear Bottom Tray Fan 2         OK         Spinning at normal speed
        Rear Bottom Tray Fan 3         OK         Spinning at normal speed
        Rear Bottom Tray Fan 4         OK         Spinning at normal speed
        Rear Bottom Tray Fan 5         OK         Spinning at normal speed
        Rear Bottom Tray Fan 6         OK         Spinning at normal speed
        Rear Bottom Tray Fan 7         OK         Spinning at normal speed
        Rear Bottom Tray Fan 8         OK         Spinning at normal speed
```

**show chassis environment (M160 Router)**

```
user@host> show chassis environment
Class Item                     Status     Measurement
Power PEM 0                    OK           PEM 1                 Absent
Temp  PCG 0                    OK         45 degrees C / 113 degrees F
      PCG 1                    Absent
      Routing Engine 0         OK         35 degrees C / 95 degrees F
      Routing Engine 1         Absent
      MCS 0                    OK         50 degrees C / 122 degrees F
      SFM 0 SPP                OK         47 degrees C / 116 degrees F
      SFM 0 SPR                OK         49 degrees C / 120 degrees F
      SFM 1 SPP                OK         50 degrees C / 122 degrees F
      SFM 1 SPR                OK         50 degrees C / 122 degrees F
      SFM 2 SPP                OK         51 degrees C / 123 degrees F
      SFM 2 SPR                OK         52 degrees C / 125 degrees F
      SFM 3 SPP                OK         52 degrees C / 125 degrees F
      SFM 3 SPR                OK         48 degrees C / 118 degrees F
      FPC 0                    OK         45 degrees C / 113 degrees F
      FPC 6                    OK         43 degrees C / 109 degrees F
      FPM CMB                  OK         31 degrees C / 87 degrees F
```

```
      FPM Display            OK         33 degrees C / 91 degrees F
Fans  Rear Bottom Blower     OK         Spinning at normal speed
      Rear Top Blower        OK         Spinning at normal speed
      Front Top Blower       OK         Spinning at normal speed
      Fan Tray Rear Left     OK         Spinning at normal speed
      Fan Tray Rear Right    OK         Spinning at normal speed
      Fan Tray Front Left    OK         Spinning at normal speed
      Fan Tray Front Right   OK         Spinning at normal speed
Misc  CIP                    OK
```

**show chassis environment (M320 Router)**

```
user@host> show chassis environment
Class Item                   Status     Measurement
Temp  PEM 0                  Absent
      PEM 1                  Absent
      PEM 2                  OK
      PEM 3                  OK
      Routing Engine 0       OK         33 degrees C / 91 degrees F
      Routing Engine 1       OK         32 degrees C / 89 degrees F
      CB 0                   OK         36 degrees C / 96 degrees F
      CB 1                   OK         36 degrees C / 96 degrees F
      SIB 0                  OK         38 degrees C / 100 degrees F
      SIB 1                  OK         29 degrees C / 84 degrees F
      SIB 2                  OK         38 degrees C / 100 degrees F
      SIB 3                  OK         41 degrees C / 105 degrees F
      FPC 0 Intake           OK         28 degrees C / 82 degrees F
      FPC 0 Exhaust          OK         40 degrees C / 104 degrees F
      FPC 1 Intake           OK         29 degrees C / 84 degrees F
      FPC 1 Exhaust          OK         39 degrees C / 102 degrees F
      FPC 2 Intake           OK         28 degrees C / 82 degrees F
      FPC 2 Exhaust          OK         38 degrees C / 100 degrees F
      FPC 3 Intake           OK         28 degrees C / 82 degrees F
      FPC 3 Exhaust          OK         39 degrees C / 102 degrees F
      FPC 6 Intake           OK         27 degrees C / 80 degrees F
      FPC 6 Exhaust          OK         39 degrees C / 102 degrees F
      FPC 7 Intake           OK         27 degrees C / 80 degrees F
      FPC 7 Exhaust          OK         42 degrees C / 107 degrees F
      FPM GBUS               OK         30 degrees C / 86 degrees F
Fan   Top Left Front fan     OK         Spinning at normal speed
      Top Right Rear fan     OK         Spinning at normal speed
      Top Right Front fan    OK         Spinning at normal speed
      Top Left Rear fan      OK         Spinning at normal speed
      Bottom Left Front fan  OK         Spinning at normal speed
      Bottom Right Rear fan  OK         Spinning at normal speed
      Bottom Right Front fan OK         Spinning at normal speed
      Bottom Left Rear fan   OK         Spinning at normal speed
      Rear Fan 1 (TOP)       OK         Spinning at normal speed
      Rear Fan 2             OK         Spinning at normal speed
      Rear Fan 3             OK         Spinning at normal speed
      Rear Fan 4             OK         Spinning at normal speed
      Rear Fan 5             OK         Spinning at normal speed
      Rear Fan 6             OK         Spinning at normal speed
      Rear Fan 7 (Bottom)    OK         Spinning at normal speed
Misc  CIP                    OK
```

**show chassis environment (MX240 Router)**

```
user@host> show chassis environment
Class Item                           Status     Measurement
Temp  PEM 0                          OK         40 degrees C / 104 degrees F
      PEM 1                          OK         45 degrees C / 113 degrees F
      PEM 2                          Absent
```

```
      PEM 3                          Absent
      Routing Engine 0               OK         39 degrees C / 102 degrees F
      Routing Engine 1               OK         37 degrees C / 98 degrees F
      CB 0 Intake                    OK         36 degrees C / 96 degrees F
      CB 0 Exhaust A                 OK         34 degrees C / 93 degrees F
      CB 0 Exhaust B                 OK         38 degrees C / 100 degrees F
      CB 0 ACBC                      OK         37 degrees C / 98 degrees F
      CB 0 SF A                      OK         49 degrees C / 120 degrees F
      CB 0 SF B                      OK         41 degrees C / 105 degrees F
      CB 1 Intake                    OK         37 degrees C / 98 degrees F
      CB 1 Exhaust A                 OK         34 degrees C / 93 degrees F
      CB 1 Exhaust B                 OK         39 degrees C / 102 degrees F
      CB 1 ACBC                      OK         38 degrees C / 100 degrees F
      CB 1 SF A                      OK         47 degrees C / 116 degrees F
      CB 1 SF B                      OK         41 degrees C / 105 degrees F
      FPC 1 Intake                   OK         33 degrees C / 91 degrees F
      FPC 1 Exhaust A                OK         38 degrees C / 100 degrees F
      FPC 1 Exhaust B                OK         53 degrees C / 127 degrees F
      FPC 1 I3 0 TSensor             OK         50 degrees C / 122 degrees F
      FPC 1 I3 0 Chip                OK         53 degrees C / 127 degrees F
      FPC 1 I3 1 TSensor             OK         49 degrees C / 120 degrees F
      FPC 1 I3 1 Chip                OK         52 degrees C / 125 degrees F
      FPC 1 I3 2 TSensor             OK         47 degrees C / 116 degrees F
      FPC 1 I3 2 Chip                OK         49 degrees C / 120 degrees F
      FPC 1 I3 3 TSensor             OK         44 degrees C / 111 degrees F
      FPC 1 I3 3 Chip                OK         46 degrees C / 114 degrees F
      FPC 1 IA 0 TSensor             OK         45 degrees C / 113 degrees F
      FPC 1 IA 0 Chip                OK         44 degrees C / 111 degrees F
      FPC 1 IA 1 TSensor             OK         44 degrees C / 111 degrees F
      FPC 1 IA 1 Chip                OK         48 degrees C / 118 degrees F
      FPC 2 Intake                   OK         32 degrees C / 89 degrees F
      FPC 2 Exhaust A                OK         40 degrees C / 104 degrees F
      FPC 2 Exhaust B                OK         52 degrees C / 125 degrees F
      FPC 2 I3 0 TSensor             OK         52 degrees C / 125 degrees F
      FPC 2 I3 0 Chip                OK         56 degrees C / 132 degrees F
      FPC 2 I3 1 TSensor             OK         52 degrees C / 125 degrees F
      FPC 2 I3 1 Chip                OK         55 degrees C / 131 degrees F
      FPC 2 I3 2 TSensor             OK         49 degrees C / 120 degrees F
      FPC 2 I3 2 Chip                OK         52 degrees C / 125 degrees F
      FPC 2 I3 3 TSensor             OK         44 degrees C / 111 degrees F
      FPC 2 I3 3 Chip                OK         48 degrees C / 118 degrees F
      FPC 2 IA 0 TSensor             OK         50 degrees C / 122 degrees F
      FPC 2 IA 0 Chip                OK         48 degrees C / 118 degrees F
      FPC 2 IA 1 TSensor             OK         47 degrees C / 116 degrees F
      FPC 2 IA 1 Chip                OK         53 degrees C / 127 degrees F
Fans  Front Fan                      OK         Spinning at normal speed
      Middle Fan                     OK         Spinning at normal speed
      Rear Fan                       OK         Spinning at normal speed
```

**show chassis environment (MX240 Router with Enhanced MX SCB)**

```
user@host> show chassis environment
Class Item                           Status     Measurement
Temp  PEM 0                          OK         40 degrees C / 104 degrees F
      PEM 1                          OK         45 degrees C / 113 degrees F
      PEM 2                          Absent
      PEM 3                          Absent
      Routing Engine 0               OK         39 degrees C / 102 degrees F
      Routing Engine 1               OK         37 degrees C / 98 degrees F
      CB 0 Intake                    OK         36 degrees C / 96 degrees F
      CB 0 Exhaust A                 OK         34 degrees C / 93 degrees F
      CB 0 Exhaust B                 OK         38 degrees C / 100 degrees F
      CB 0 ACBC                      OK         37 degrees C / 98 degrees F
```

```
           CB 0 XF A                      OK         49 degrees C / 120 degrees F
           CB 0 XF B                      OK         41 degrees C / 105 degrees F
           CB 1 Intake                    OK         37 degrees C / 98 degrees F
           CB 1 Exhaust A                 OK         34 degrees C / 93 degrees F
           CB 1 Exhaust B                 OK         39 degrees C / 102 degrees F
           CB 1 ACBC                      OK         38 degrees C / 100 degrees F
           CB 1 XF A                      OK         47 degrees C / 116 degrees F
           CB 1 XF B                      OK         41 degrees C / 105 degrees F
           FPC 1 Intake                   OK         33 degrees C / 91 degrees F
           FPC 1 Exhaust A                OK         38 degrees C / 100 degrees F
           FPC 1 Exhaust B                OK         53 degrees C / 127 degrees F
           FPC 1 I3 0 TSensor             OK         50 degrees C / 122 degrees F
           FPC 1 I3 0 Chip                OK         53 degrees C / 127 degrees F
           FPC 1 I3 1 TSensor             OK         49 degrees C / 120 degrees F
           FPC 1 I3 1 Chip                OK         52 degrees C / 125 degrees F
           FPC 1 I3 2 TSensor             OK         47 degrees C / 116 degrees F
           FPC 1 I3 2 Chip                OK         49 degrees C / 120 degrees F
           FPC 1 I3 3 TSensor             OK         44 degrees C / 111 degrees F
           FPC 1 I3 3 Chip                OK         46 degrees C / 114 degrees F
           FPC 1 IA 0 TSensor             OK         45 degrees C / 113 degrees F
           FPC 1 IA 0 Chip                OK         44 degrees C / 111 degrees F
           FPC 1 IA 1 TSensor             OK         44 degrees C / 111 degrees F
           FPC 1 IA 1 Chip                OK         48 degrees C / 118 degrees F
           FPC 2 Intake                   OK         32 degrees C / 89 degrees F
           FPC 2 Exhaust A                OK         40 degrees C / 104 degrees F
           FPC 2 Exhaust B                OK         52 degrees C / 125 degrees F
           FPC 2 I3 0 TSensor             OK         52 degrees C / 125 degrees F
           FPC 2 I3 0 Chip                OK         56 degrees C / 132 degrees F
           FPC 2 I3 1 TSensor             OK         52 degrees C / 125 degrees F
           FPC 2 I3 1 Chip                OK         55 degrees C / 131 degrees F
           FPC 2 I3 2 TSensor             OK         49 degrees C / 120 degrees F
           FPC 2 I3 2 Chip                OK         52 degrees C / 125 degrees F
           FPC 2 I3 3 TSensor             OK         44 degrees C / 111 degrees F
           FPC 2 I3 3 Chip                OK         48 degrees C / 118 degrees F
           FPC 2 IA 0 TSensor             OK         50 degrees C / 122 degrees F
           FPC 2 IA 0 Chip                OK         48 degrees C / 118 degrees F
           FPC 2 IA 1 TSensor             OK         47 degrees C / 116 degrees F
           FPC 2 IA 1 Chip                OK         53 degrees C / 127 degrees F
     Fans  Front Fan                      OK         Spinning at normal speed
           Middle Fan                     OK         Spinning at normal speed
           Rear Fan                       OK         Spinning at normal speed
```

### show chassis environment (MX480 Router)

```
user@host> show chassis environment
Class Item                           Status     Measurement
Temp  PEM 0                          OK         35 degrees C / 95 degrees F
      PEM 1                          OK         40 degrees C / 104 degrees F
      PEM 2                          Absent
      PEM 3                          Absent
      Routing Engine 0               OK         44 degrees C / 111 degrees F
      Routing Engine 1               OK         45 degrees C / 113 degrees F
      CB 0 Intake                    OK         36 degrees C / 96 degrees F
      CB 0 Exhaust A                 OK         38 degrees C / 100 degrees F
      CB 0 Exhaust B                 OK         39 degrees C / 102 degrees F
      CB 0 ACBC                      OK         37 degrees C / 98 degrees F
      CB 0 SF A                      OK         51 degrees C / 123 degrees F
      CB 0 SF B                      OK         44 degrees C / 111 degrees F
      CB 1 Intake                    OK         36 degrees C / 96 degrees F
      CB 1 Exhaust A                 OK         39 degrees C / 102 degrees F
      CB 1 Exhaust B                 OK         40 degrees C / 104 degrees F
      CB 1 ACBC                      OK         37 degrees C / 98 degrees F
      CB 1 SF A                      OK         50 degrees C / 122 degrees F
```

```
      CB 1 SF B                      OK         43 degrees C / 109 degrees F
      FPC 0 Intake                   OK         36 degrees C / 96 degrees F
      FPC 0 Exhaust A                OK         39 degrees C / 102 degrees F
      FPC 0 Exhaust B                OK         51 degrees C / 123 degrees F
      FPC 0 I3 0 TSensor             OK         49 degrees C / 120 degrees F
      FPC 0 I3 0 Chip                OK         56 degrees C / 132 degrees F
      FPC 0 I3 1 TSensor             OK         47 degrees C / 116 degrees F
      FPC 0 I3 1 Chip                OK         52 degrees C / 125 degrees F
      FPC 0 I3 2 TSensor             OK         46 degrees C / 114 degrees F
      FPC 0 I3 2 Chip                OK         48 degrees C / 118 degrees F
      FPC 0 I3 3 TSensor             OK         42 degrees C / 107 degrees F
      FPC 0 I3 3 Chip                OK         45 degrees C / 113 degrees F
      FPC 0 IA 0 TSensor             OK         45 degrees C / 113 degrees F
      FPC 0 IA 0 Chip                OK         45 degrees C / 113 degrees F
      FPC 0 IA 1 TSensor             OK         44 degrees C / 111 degrees F
      FPC 0 IA 1 Chip                OK         48 degrees C / 118 degrees F
      FPC 1 Intake                   OK         37 degrees C / 98 degrees F
      FPC 1 Exhaust A                OK         41 degrees C / 105 degrees F
      FPC 1 Exhaust B                OK         52 degrees C / 125 degrees F
      FPC 1 I3 0 TSensor             OK         51 degrees C / 123 degrees F
      FPC 1 I3 0 Chip                OK         57 degrees C / 134 degrees F
      FPC 1 I3 1 TSensor             OK         48 degrees C / 118 degrees F
      FPC 1 I3 1 Chip                OK         52 degrees C / 125 degrees F
      FPC 1 I3 2 TSensor             OK         46 degrees C / 114 degrees F
      FPC 1 I3 2 Chip                OK         50 degrees C / 122 degrees F
      FPC 1 I3 3 TSensor             OK         42 degrees C / 107 degrees F
      FPC 1 I3 3 Chip                OK         46 degrees C / 114 degrees F
      FPC 1 IA 0 TSensor             OK         49 degrees C / 120 degrees F
      FPC 1 IA 0 Chip                OK         48 degrees C / 118 degrees F
      FPC 1 IA 1 TSensor             OK         46 degrees C / 114 degrees F
      FPC 1 IA 1 Chip                OK         50 degrees C / 122 degrees F
Fans  Top Rear Fan                   OK         Spinning at normal speed
      Bottom Rear Fan                OK         Spinning at normal speed
      Top Middle Fan                 OK         Spinning at normal speed
      Bottom Middle Fan              OK         Spinning at normal speed
      Top Front Fan                  OK         Spinning at normal speed
      Bottom Front Fan               OK         Spinning at normal speed
```

### show chassis environment (MX480 Router with Enhanced MX SCB)

```
user@host> show chassis environment
Class Item                           Status     Measurement
Temp  PEM 0                          OK         35 degrees C / 95 degrees F
      PEM 1                          OK         40 degrees C / 104 degrees F
      PEM 2                          Absent
      PEM 3                          Absent
      Routing Engine 0               OK         44 degrees C / 111 degrees F
      Routing Engine 1               OK         45 degrees C / 113 degrees F
      CB 0 Intake                    OK         36 degrees C / 96 degrees F
      CB 0 Exhaust A                 OK         38 degrees C / 100 degrees F
      CB 0 Exhaust B                 OK         39 degrees C / 102 degrees F
      CB 0 ACBC                      OK         37 degrees C / 98 degrees F
      CB 0 XF A                      OK         51 degrees C / 123 degrees F
      CB 0 XF B                      OK         44 degrees C / 111 degrees F
      CB 1 Intake                    OK         36 degrees C / 96 degrees F
      CB 1 Exhaust A                 OK         39 degrees C / 102 degrees F
      CB 1 Exhaust B                 OK         40 degrees C / 104 degrees F
      CB 1 ACBC                      OK         37 degrees C / 98 degrees F
      CB 1 XF A                      OK         50 degrees C / 122 degrees F
      CB 1 XF B                      OK         43 degrees C / 109 degrees F
      FPC 0 Intake                   OK         36 degrees C / 96 degrees F
      FPC 0 Exhaust A                OK         39 degrees C / 102 degrees F
      FPC 0 Exhaust B                OK         51 degrees C / 123 degrees F
```

```
      FPC 0 I3 0 TSensor           OK         49 degrees C / 120 degrees F
      FPC 0 I3 0 Chip              OK         56 degrees C / 132 degrees F
      FPC 0 I3 1 TSensor           OK         47 degrees C / 116 degrees F
      FPC 0 I3 1 Chip              OK         52 degrees C / 125 degrees F
      FPC 0 I3 2 TSensor           OK         46 degrees C / 114 degrees F
      FPC 0 I3 2 Chip              OK         48 degrees C / 118 degrees F
      FPC 0 I3 3 TSensor           OK         42 degrees C / 107 degrees F
      FPC 0 I3 3 Chip              OK         45 degrees C / 113 degrees F
      FPC 0 IA 0 TSensor           OK         45 degrees C / 113 degrees F
      FPC 0 IA 0 Chip              OK         45 degrees C / 113 degrees F
      FPC 0 IA 1 TSensor           OK         44 degrees C / 111 degrees F
      FPC 0 IA 1 Chip              OK         48 degrees C / 118 degrees F
      FPC 1 Intake                 OK         37 degrees C / 98 degrees F
      FPC 1 Exhaust A              OK         41 degrees C / 105 degrees F
      FPC 1 Exhaust B              OK         52 degrees C / 125 degrees F
      FPC 1 I3 0 TSensor           OK         51 degrees C / 123 degrees F
      FPC 1 I3 0 Chip              OK         57 degrees C / 134 degrees F
      FPC 1 I3 1 TSensor           OK         48 degrees C / 118 degrees F
      FPC 1 I3 1 Chip              OK         52 degrees C / 125 degrees F
      FPC 1 I3 2 TSensor           OK         46 degrees C / 114 degrees F
      FPC 1 I3 2 Chip              OK         50 degrees C / 122 degrees F
      FPC 1 I3 3 TSensor           OK         42 degrees C / 107 degrees F
      FPC 1 I3 3 Chip              OK         46 degrees C / 114 degrees F
      FPC 1 IA 0 TSensor           OK         49 degrees C / 120 degrees F
      FPC 1 IA 0 Chip              OK         48 degrees C / 118 degrees F
      FPC 1 IA 1 TSensor           OK         46 degrees C / 114 degrees F
      FPC 1 IA 1 Chip              OK         50 degrees C / 122 degrees F
Fans  Top Rear Fan                 OK         Spinning at normal speed
      Bottom Rear Fan              OK         Spinning at normal speed
      Top Middle Fan               OK         Spinning at normal speed
      Bottom Middle Fan            OK         Spinning at normal speed
      Top Front Fan                OK         Spinning at normal speed
      Bottom Front Fan             OK         Spinning at normal speed
```

### show chassis environment (MX960 Router)

```
user@host> show chassis environment
Class Item                         Status     Measurement
Temp  PEM 0                        Absent
      PEM 1                        Absent
      PEM 2                        Check
      PEM 3                        OK         35 degrees C / 95 degrees F
      Routing Engine 0             OK         37 degrees C / 98 degrees F
      Routing Engine 1             Absent
      CB 0 Intake                  OK         24 degrees C / 75 degrees F
      CB 0 Exhaust A               OK         30 degrees C / 86 degrees F
      CB 0 Exhaust B               OK         27 degrees C / 80 degrees F
      CB 1 Intake                  Absent
      CB 1 Exhaust A               Absent
      CB 1 Exhaust B               Absent
      CB 1 ACBC                    Absent
      CB 1 SF A                    Absent
      CB 1 SF B                    Absent
      CB 2 Intake                  Absent
      CB 2 Exhaust A               Absent
      CB 2 Exhaust B               Absent
      CB 2 ACBC                    Absent
      CB 2 SF A                    Absent
      CB 2 SF B                    Absent
      FPC 4 Intake                 OK         24 degrees C / 75 degrees F
      FPC 4 Exhaust A              OK         36 degrees C / 96 degrees F
      FPC 4 Exhaust B              OK         38 degrees C / 100 degrees F
      FPC 7 Intake                 OK         24 degrees C / 75 degrees F
```

```
      FPC 7 Exhaust A               OK         36 degrees C / 96 degrees F
      FPC 7 Exhaust B               OK         42 degrees C / 107 degrees F
Fans  Top Fan Tray Temp             Failed
      Top Tray Fan 1                OK         Spinning at normal speed
      Top Tray Fan 2                OK         Spinning at normal speed
      Top Tray Fan 3                OK         Spinning at normal speed
      Top Tray Fan 4                OK         Spinning at normal speed
      Top Tray Fan 5                OK         Spinning at normal speed
      Top Tray Fan 6                OK         Spinning at normal speed
      Bottom Fan Tray Temp          Failed
      Bottom Tray Fan 1             OK         Spinning at normal speed
      Bottom Tray Fan 2             OK         Spinning at normal speed
      Bottom Tray Fan 3             OK         Spinning at normal speed
      Bottom Tray Fan 4             OK         Spinning at normal speed
      Bottom Tray Fan 5             OK         Spinning at normal speed
      Bottom Tray Fan 6             OK         Spinning at normal speed
```

### show chassis environment (MX960 Router with Enhanced MX SCB)

```
user@host> show chassis environment
Class Item                          Status     Measurement
Temp  PEM 0                         Absent
      PEM 1                         OK         50 degrees C / 122 degrees F
      PEM 2                         OK         50 degrees C / 122 degrees F
      PEM 3                         OK         50 degrees C / 122 degrees F
      Routing Engine 0              OK         42 degrees C / 107 degrees F
      Routing Engine 0 CPU          OK         51 degrees C / 123 degrees F
      Routing Engine 1              OK         39 degrees C / 102 degrees F
      Routing Engine 1 CPU          OK         44 degrees C / 111 degrees F
      CB 0 Intake                   OK         35 degrees C / 95 degrees F
      CB 0 Exhaust A                OK         36 degrees C / 96 degrees F
      CB 0 Exhaust B                OK         43 degrees C / 109 degrees F
      CB 0 ACBC                     OK         38 degrees C / 100 degrees F
      CB 0 XF A                     OK         53 degrees C / 127 degrees F
      CB 0 XF B                     OK         47 degrees C / 116 degrees F
      CB 1 Intake                   OK         35 degrees C / 95 degrees F
      CB 1 Exhaust A                OK         35 degrees C / 95 degrees F
      CB 1 Exhaust B                OK         41 degrees C / 105 degrees F
      CB 1 ACBC                     OK         38 degrees C / 100 degrees F
      CB 1 XF A                     OK         52 degrees C / 125 degrees F
      CB 1 XF B                     OK         47 degrees C / 116 degrees F
      CB 2 Intake                   OK         32 degrees C / 89 degrees F
      CB 2 Exhaust A                OK         30 degrees C / 86 degrees F
      CB 2 Exhaust B                OK         35 degrees C / 95 degrees F
      CB 2 ACBC                     OK         33 degrees C / 91 degrees F
      CB 2 XF A                     OK         51 degrees C / 123 degrees F
      CB 2 XF B                     OK         50 degrees C / 122 degrees F
      FPC 0 Intake                  OK         35 degrees C / 95 degrees F
      FPC 0 Exhaust A               OK         39 degrees C / 102 degrees F
      FPC 0 Exhaust B               OK         50 degrees C / 122 degrees F
      FPC 0 I3 0 TSensor            OK         50 degrees C / 122 degrees F
      FPC 0 I3 0 Chip               OK         56 degrees C / 132 degrees F
      FPC 0 I3 1 TSensor            OK         47 degrees C / 116 degrees F
      FPC 0 I3 1 Chip               OK         50 degrees C / 122 degrees F
      FPC 0 I3 2 TSensor            OK         45 degrees C / 113 degrees F
      FPC 0 I3 2 Chip               OK         48 degrees C / 118 degrees F
      FPC 0 I3 3 TSensor            OK         41 degrees C / 105 degrees F
      FPC 0 I3 3 Chip               OK         44 degrees C / 111 degrees F
      FPC 0 IA 0 TSensor            OK         45 degrees C / 113 degrees F
      FPC 0 IA 0 Chip               OK         45 degrees C / 113 degrees F
      FPC 0 IA 1 TSensor            OK         44 degrees C / 111 degrees F
      FPC 0 IA 1 Chip               OK         48 degrees C / 118 degrees F
      FPC 1 Intake                  OK         36 degrees C / 96 degrees F
```

```
FPC 1 Exhaust A               OK          47 degrees C / 116 degrees F
FPC 1 Exhaust B               OK          43 degrees C / 109 degrees F
FPC 1 LU 0 TCAM TSen          OK          53 degrees C / 127 degrees F
FPC 1 LU 0 TCAM Chip          OK          57 degrees C / 134 degrees F
FPC 1 LU 0 TSen               OK          53 degrees C / 127 degrees F
FPC 1 LU 0 Chip               OK          60 degrees C / 140 degrees F
FPC 1 MQ 0 TSen               OK          53 degrees C / 127 degrees F
FPC 1 MQ 0 Chip               OK          56 degrees C / 132 degrees F
FPC 1 LU 1 TCAM TSen          OK          51 degrees C / 123 degrees F
FPC 1 LU 1 TCAM Chip          OK          52 degrees C / 125 degrees F
FPC 1 LU 1 TSen               OK          51 degrees C / 123 degrees F
FPC 1 LU 1 Chip               OK          53 degrees C / 127 degrees F
FPC 1 MQ 1 TSen               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 TSen               OK          53 degrees C / 127 degrees F
FPC 5 LU 0 Chip               OK          54 degrees C / 129 degrees F
FPC 5 LU 1 TSen               OK          53 degrees C / 127 degrees F
FPC 5 LU 1 Chip               OK          61 degrees C / 141 degrees F
FPC 5 LU 2 TSen               OK          53 degrees C / 127 degrees F
FPC 5 LU 2 Chip               OK          51 degrees C / 123 degrees F
FPC 5 LU 3 TSen               OK          53 degrees C / 127 degrees F
FPC 5 LU 3 Chip               OK          53 degrees C / 127 degrees F
FPC 5 MQ 0 TSen               OK          47 degrees C / 116 degrees F
FPC 5 MQ 0 Chip               OK          52 degrees C / 125 degrees F
FPC 5 MQ 1 TSen               OK          47 degrees C / 116 degrees F
FPC 5 MQ 1 Chip               OK          52 degrees C / 125 degrees F
FPC 5 MQ 2 TSen               OK          47 degrees C / 116 degrees F
FPC 5 MQ 2 Chip               OK          46 degrees C / 114 degrees F
FPC 5 MQ 3 TSen               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 TSen               OK          42 degrees C / 107 degrees F
```

```
      FPC 7 QX 0 Chip               OK          47 degrees C / 116 degrees F
      FPC 7 LU 0 TCAM TSen          OK          42 degrees C / 107 degrees F
      FPC 7 LU 0 TCAM Chip          OK          44 degrees C / 111 degrees F
      FPC 7 LU 0 TSen               OK          42 degrees C / 107 degrees F
      FPC 7 LU 0 Chip               OK          46 degrees C / 114 degrees F
      FPC 7 MQ 0 TSen               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 (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 (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@host> 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 (QFX Series)**

```
user@switch> show chassis environment
Class Item                           Status     Measurement
Power FPC 0 Power Supply 0           OK
      FPC 0 Power Supply 1           OK
Temp  FPC 0 Sensor TopLeft I         OK         26 degrees C / 78 degrees F
      FPC 0 Sensor TopRight I        OK         24 degrees C / 75 degrees F
      FPC 0 Sensor TopLeft E         OK         30 degrees C / 86 degrees F
      FPC 0 Sensor TopRight E        OK         30 degrees C / 86 degrees F
      FPC 0 Sensor TopMiddle I       OK         30 degrees C / 86 degrees F
      FPC 0 Sensor TopMiddle E       OK         38 degrees C / 100 degrees F
      FPC 0 Sensor Bottom I          OK         34 degrees C / 93 degrees F
      FPC 0 Sensor Bottom E          OK         38 degrees C / 100 degrees F
      FPC 0 Sensor Die Temp          OK         38 degrees C / 100 degrees F
      FPC 0 Sensor Mgmnt Brd I       OK         24 degrees C / 75 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 node-device (QFabric Switch)**

```
user@switch> show chassis environment node-device node1
Class Item                           Status     Measurement
Power node1 Power Supply 0            Absent
      node1 Power Supply 1            Absent
Fans  node1 Fan Tray 0                Testing
      node1 Fan Tray 1                Testing
      node1 Fan Tray 2                Testing
```

## show chassis environment 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 Router)**

show chassis environment cb
<*slot*>
<all-members>
<local>
<member *member-id*>

**Release Information**

Command introduced before Junos 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 Release 9.6.

**Description**

(M120, M320. MX Series, and T Series routers and EX8200 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.

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 the routers, replace ***slot*** with **0** or **1**. On the switches, replace ***slot*** with **0**, **1**, or **2**.

*slot*—(Optional) Display environmental information about the specified CB. On EX8200 switches, replace ***slot*** with **0** or **1** or **2**.

**Required Privilege Level**

view

**List of Sample Output**

show chassis environment cb (M120 Router) on page 257
show chassis environment cb (M320 Router) on page 257
show chassis environment cb (MX80 Router) on page 258
show chassis environment cb (MX240 Router) on page 258
show chassis environment cb (MX240 Router with Enhanced MX SCB) on page 259
show chassis environment cb (MX480 Router) on page 259
show chassis environment cb (MX480 Router with Enhanced MX SCB) on page 259
show chassis environment cb (MX960 Router) on page 260
show chassis environment cb (MX960 Router with Enhanced MX SCB) on page 260
show chassis environment cb (TX Matrix Router) on page 261
show chassis environment cb (TX Matrix Plus Router) on page 262
show chassis environment cb (EX8200 Switch) on page 265
show chassis environment cb (EX8208 Switch) on page 266

**Output Fields**

Table 24 on page 256 lists the output fields for the **show chassis environment cb** command. Output fields are listed in the approximate order in which they appear.

## Table 24: 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.<br>• **Online**—CB is online and running.<br>• **Offline**— CB is powered down.<br>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.<br>• **Temperature Intake**—Measures the temperature of the air intake to cool the power supplies.<br>• **Temperature Exhaust**—Measures the temperature of the hot air exhaust. |
| **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.) |

### Table 24: show chassis environment cb Output Fields *(continued)*

| Field Name | Field Description |
|---|---|
| **FPGA Revision** | Revision level of the field-programmable gate array (FPGA). (Not on switches.) |
| **PMBus device** (on MX240, MX480, and MX960 routers with Enhanced MX SCB) | Enhanced SCB on MX 240, MX480, and MX960 routers allows the system to save power by supplying only the amount of voltage that is required. Configurable PMBus devices are used to provide the voltage for each individual device. There is one PMBus device for each XF ASIC so that the output can be customized to each device. The following PMBus device information is displayed for routers with Enhanced MX SCB:<br>• **Expected voltage**<br>• **Measured voltage**<br>• **Measured current**<br>• **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 (MX240 Router with Enhanced MX SCB)**

```
user@host> show chassis environment cb
CB 0 status:
  State                       Online Standby
  Temperature                 37 degrees C / 98 degrees F
  Power 1
    1.2 V                      1208 mV
    1.5 V                      1521 mV
    1.8 V                      1811 mV
    2.5 V                      2513 mV
    3.3 V                      3332 mV
    5.0 V                      5059 mV
    12.0 V                    12162 mV
    1.25 V                     1260 mV
    3.3 V SM3                  3306 mV
    5.0 V RE                   5085 mV
    12.0 V RE                 11872 mV
  Power 2
    11.3 V bias PEM           11272 mV
    4.6 V bias MidPlane        4827 mV
    11.3 V bias FPD           11272 mV
    11.3 V bias POE 0         11292 mV
    11.3 V bias POE 1         11253 mV
  Bus Revision                42
  FPGA Revision               1
  PMBus              Expected   Measured   Measured  Calculated
  device             voltage    voltage    current   power
    XF ASIC A         1000 mV     997 mV   11031 mA   10997 mW
    XF ASIC B         1000 mV     996 mV   12125 mA   12076 mW
```

**show chassis environment cb (MX480 Router)**

```
user@host> show chassis environment cb
CB 0 status:
  State                       Online Master
  Temperature                 41 degrees C / 105 degrees F
  Power 1
    1.2 V                      1202 mV
    1.5 V                      1511 mV
    1.8 V                      1798 mV
    2.5 V                      2507 mV
    3.3 V                      3312 mV
    5.0 V                      5027 mV
    12.0 V                    12200 mV
    1.25 V                     1260 mV
    3.3 V SM3                  3293 mV
    5 V RE                     5040 mV
    12 V RE                   11910 mV
  Power 2
    11.3 V bias PEM           11156 mV
    4.6 V bias MidPlane        4801 mV
    11.3 V bias FPD           11214 mV
    11.3 V bias POE 0         11098 mV
    11.3 V bias POE 1         11330 mV
  Bus Revision                42
  FPGA Revision               1
```

**show chassis environment cb (MX480 Router with Enhanced MX SCB)**

```
user@host> show chassis environment cb
CB 0 status:
  State                       Online Master
  Temperature                 41 degrees C / 105 degrees F
  Power 1
    1.2 V                      1202 mV
```

```
    1.5 V                      1511 mV
    1.8 V                      1798 mV
    2.5 V                      2507 mV
    3.3 V                      3312 mV
    5.0 V                      5027 mV
    12.0 V                    12200 mV
    1.25 V                     1260 mV
    3.3 V SM3                  3293 mV
    5 V RE                     5040 mV
    12 V RE                   11910 mV
  Power 2
    11.3 V bias PEM           11156 mV
    4.6 V bias MidPlane        4801 mV
    11.3 V bias FPD           11214 mV
    11.3 V bias POE 0         11098 mV
    11.3 V bias POE 1         11330 mV
  Bus Revision                42
  FPGA Revision               1
  PMBus             Expected   Measured   Measured  Calculated
  device            voltage    voltage    current   power
    XF ASIC A        1000 mV     997 mV   11031 mA   10997 mW
    XF ASIC B        1000 mV     996 mV   12125 mA   12076 mW
```

### show chassis environment cb (MX960 Router)

```
user@host> show chassis environment cb
CB 0 status:
  State                       Online Master
  Temperature                 24 degrees C / 75 degrees F
  Power 1
    1.2 V                      1965 mV
    1.5 V                      2465 mV
    1.8 V                      2990 mV
    2.5 V                      3296 mV
    3.3 V                      3296 mV
    5.0 V                      6593 mV
    12.0 V                    13187 mV
    3.3 V bias                 3296 mV
    1.25 V                     1994 mV
    3.3 V SM3                  3296 mV
    5 V RE                     6593 mV
    12 V RE                   13174 mV
  Power 2                     Sensor failure
  Bus Revision                4
  FPGA Revision               3
```

### show chassis environment cb (MX960 Router with Enhanced MX SCB)

```
user@host> show chassis environment cb
CB 0 status:
  State                       Online Master
  Temperature                 24 degrees C / 75 degrees F
  Power 1
    1.2 V                      1965 mV
    1.5 V                      2465 mV
    1.8 V                      2990 mV
    2.5 V                      3296 mV
    3.3 V                      3296 mV
    5.0 V                      6593 mV
    12.0 V                    13187 mV
    3.3 V bias                 3296 mV
    1.25 V                     1994 mV
    3.3 V SM3                  3296 mV
    5 V RE                     6593 mV
    12 V RE                   13174 mV
```

```
  Power 2                    Sensor failure
  Bus Revision               4
  FPGA Revision              3
  PMBus             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 (TX Matrix Router)**

```
user@host> show chassis environment cb
--------------------------------------------------------------------------
CB 0 status:
  State                             Online Master
  Temperature                    32 degrees C / 89 degrees F
  Power:
    1.8 V                      1797 mV
    2.5 V                      2477 mV
    3.3 V                      3311 mV
    4.6 V                      4727 mV
    5.0 V                      5015 mV
    12.0 V                    12185 mV
    3.3 V bias                 3304 mV
    8.0 V bias                 7870 mV
  BUS Revision                   40
  FPGA Revision                   1
CB 1 status:
  State                             Online Standby
...

lcc0-re0:
--------------------------------------------------------------------------
CB 0 status:
  State                             Online Master
  Temperature                    32 degrees C / 89 degrees F
  Power:
    1.8 V                      1787 mV
    2.5 V                      2473 mV
    3.3 V                      3306 mV
    4.6 V                      4793 mV
    5.0 V                      5025 mV
    12.0 V                    12156 mV
    3.3 V bias                 3289 mV
    8.0 V bias                 7609 mV
  BUS Revision                   40
  FPGA Revision                   5
CB 1 status:
  State                             Online Standby
 ....
  BUS Revision                   40
  FPGA Revision                   5

lcc2-re0:
--------------------------------------------------------------------------
CB 0 status:
  State                             Online Master
 ...
CB 1 status:
  State                             Online Standby
 ...
```

**show chassis environment cb (TX Matrix Plus Router)**

```
user@host> show chassis environment cb
sfc0-re0:
--------------------------------------------------------------------------
CB 0 status:
  State                        Online Master
  Temperature                  38 degrees C / 100 degrees F
  Power 1
    1.0 V                       1005 mV
    1.1 V                       1108 mV
    1.2 V                       1205 mV
    1.25 V                      1269 mV
    1.5 V                       1508 mV
    1.8 V                       1814 mV
    2.5 V                       2507 mV
    3.3 V                       3306 mV
    3.3 V bias                  3300 mV
    9.0 V                       9058 mV
    9.0 V RE                    9107 mV
  Power 2
    3.9 V                       3963 mV
    5.0 V                       5020 mV
    9.0 V                       9087 mV
  Bus Revision                 79
  FPGA Revision                23
CB 1 status:
  State                        Online Standby
  Temperature                  39 degrees C / 102 degrees F
  Power 1
    1.0 V                       1002 mV
    1.1 V                       1105 mV
    1.2 V                       1198 mV
    1.25 V                      1276 mV
    1.5 V                       1504 mV
    1.8 V                       1804 mV
    2.5 V                       2507 mV
    3.3 V                       3300 mV
    3.3 V bias                  3293 mV
    9.0 V                       9039 mV
    9.0 V RE                    9049 mV
  Power 2
    3.9 V                       3892 mV
    5.0 V                       5040 mV
    9.0 V                       9058 mV
  Bus Revision                 79
  FPGA Revision                23

lcc0-re0:
--------------------------------------------------------------------------
CB 0 status:
  State                        Online Master
  Temperature                  39 degrees C / 102 degrees F
  Power 1
    1.8 V                       1799 mV
    2.5 V                       2499 mV
    3.3 V                       3327 mV
    3.3 V bias                  3299 mV
    4.6 V                       4673 mV
    5.0 V                       4918 mV
    8.0 V bias                  7308 mV
    12.0 V                     11887 mV
  Power 2
```

```
    1.0 V                      996 mV
    1.2 V                     1199 mV
    3.3 V RE                  3319 mV
  Bus Revision              51
  FPGA Revision             3
CB 1 status:
  State                     Online Standby
  Temperature               40 degrees C / 104 degrees F
  Power 1
    1.8 V                     1800 mV
    2.5 V                     2496 mV
    3.3 V                     3322 mV
    3.3 V bias                3284 mV
    4.6 V                     4680 mV
    5.0 V                     4954 mV
    8.0 V bias                7284 mV
    12.0 V                   11902 mV
  Power 2
    1.0 V                      998 mV
    1.2 V                     1205 mV
    3.3 V RE                  3327 mV
  Bus Revision              51
  FPGA Revision             3

lcc1-re0:
--------------------------------------------------------------------------
CB 0 status:
  State                     Online Master
  Temperature               41 degrees C / 105 degrees F
  Power 1
    1.8 V                     1804 mV
    2.5 V                     2517 mV
    3.3 V                     3300 mV
    3.3 V bias                3284 mV
    4.6 V                     4681 mV
    5.0 V                     4927 mV
    8.0 V bias                7357 mV
    12.0 V                   11907 mV
  Power 2
    1.0 V                      991 mV
    1.2 V                     1202 mV
    3.3 V RE                  3301 mV
  Bus Revision              51
  FPGA Revision             3
CB 1 status:
  State                     Online Standby
  Temperature               40 degrees C / 104 degrees F
  Power 1
    1.8 V                     1805 mV
    2.5 V                     2528 mV
    3.3 V                     3324 mV
    3.3 V bias                3289 mV
    4.6 V                     4694 mV
    5.0 V                     4959 mV
    8.0 V bias                7311 mV
    12.0 V                   11926 mV
  Power 2
    1.0 V                      998 mV
    1.2 V                     1200 mV
    3.3 V RE                  3313 mV
  Bus Revision              51
```

```
  FPGA Revision              3

lcc2-re0:
--------------------------------------------------------------------------
CB 0 status:
  State                      Online Master
  Temperature                41 degrees C / 105 degrees F
  Power 1
    1.8 V                     1805 mV
    2.5 V                     2494 mV
    3.3 V                     3333 mV
    3.3 V bias                3296 mV
    4.6 V                     4673 mV
    5.0 V                     4901 mV
    8.0 V bias                7343 mV
    12.0 V                   11916 mV
  Power 2
    1.0 V                      993 mV
    1.2 V                     1213 mV
    3.3 V RE                  3328 mV
  Bus Revision               51
  FPGA Revision              3
CB 1 status:
  State                      Online Standby
  Temperature                41 degrees C / 105 degrees F
  Power 1
    1.8 V                     1804 mV
    2.5 V                     2523 mV
    3.3 V                     3334 mV
    3.3 V bias                3291 mV
    4.6 V                     4697 mV
    5.0 V                     4969 mV
    8.0 V bias                7308 mV
    12.0 V                   11936 mV
  Power 2
    1.0 V                      996 mV
    1.2 V                     1200 mV
    3.3 V RE                  3328 mV
  Bus Revision               51
  FPGA Revision              3

lcc3-re0:
--------------------------------------------------------------------------
CB 0 status:
  State                      Online Master
  Temperature                37 degrees C / 98 degrees F
  Power 1
    1.8 V                     1809 mV
    2.5 V                     2510 mV
    3.3 V                     3296 mV
    3.3 V bias                3291 mV
    4.6 V                     4670 mV
    5.0 V                     4905 mV
    8.0 V bias                7211 mV
    12.0 V                   11882 mV
  Power 2
    1.0 V                      996 mV
    1.2 V                     1188 mV
    3.3 V RE                  3326 mV
  Bus Revision               51
  FPGA Revision              5
```

```
CB 1 status:
  State                      Online Standby
  Temperature                38 degrees C / 100 degrees F
  Power 1
    1.8 V                     1813 mV
    2.5 V                     2510 mV
    3.3 V                     3322 mV
    3.3 V bias                3289 mV
    4.6 V                     4692 mV
    5.0 V                     4967 mV
    8.0 V bias                7194 mV
    12.0 V                   11916 mV
  Power 2
    1.0 V                      996 mV
    1.2 V                     1205 mV
    3.3 V RE                  3273 mV
  Bus Revision               51
  FPGA Revision              5
```

**show chassis environment cb (EX8200 Switch)**

`user@host>` **show chassis environment cb**

```
CB 0 status:
  State                      Online Master
  Temperature Intake         20 degrees C / 68 degrees F
  Temperature Exhaust        24 degrees C / 75 degrees F
  Power 1
    1.1 V                     1086 mV
    1.2 V                     1179 mV
    1.2 V *                   1182 mV
    1.2 V *                   1182 mV
    1.25 V                    1211 mV
    1.5 V                     1472 mV
    1.8 V                     1756 mV
    2.5 V                     2449 mV
    3.3 V                     3254 mV
    3.3 V bias                3300 mV
    5.0 V                     4911 mV
    12.0 V                   11891 mV
  Power 2
    3.3 V bias *              3615 mV
    3.3 V bias *              3615 mV
    3.3 V bias *              3567 mV
    3.3 V bias *              3664 mV
    4.3 V bias *              4224 mV
    4.3 V bias *              4215 mV
    4.3 V bias *              4224 mV
    4.3 V bias *              4205 mV
    4.3 V bias *              4195 mV
    4.3 V bias *              4215 mV
    5.0 V bias                4920 mV
CB 1 status:
  State                      Online Standby
  Temperature Intake         19 degrees C / 66 degrees F
  Temperature Exhaust        23 degrees C / 73 degrees F
  Power 1
    1.1 V                     1082 mV
    1.2 V                     1169 mV
    1.2 V *                   1179 mV
    1.2 V *                   1179 mV
    1.25 V                    1214 mV
    1.5 V                     1482 mV
```

```
    1.8 V                     1759 mV
    2.5 V                     2481 mV
    3.3 V                     3248 mV
    3.3 V bias                3306 mV
    5.0 V                     4911 mV
    12.0 V                   11910 mV
  Power 2
    3.3 V bias *              3644 mV
    3.3 V bias *              3664 mV
    3.3 V bias *              3586 mV
    3.3 V bias *              3654 mV
    4.3 V bias *              4224 mV
    4.3 V bias *              4215 mV
    4.3 V bias *              4224 mV
    4.3 V bias *              4205 mV
    4.3 V bias *              4244 mV
    4.3 V bias *              4215 mV
    5.0 V bias                4930 mV
CB 2 status:
  State                      Online
  Temperature Intake         19 degrees C / 66 degrees F
  Temperature Exhaust        23 degrees C / 73 degrees F
  Power 1
    1.2 V                     1195 mV
    1.5 V                     1511 mV
    1.8 V                     1804 mV
    2.5 V                     2526 mV
    3.3 V                     3300 mV
    3.3 V bias                3306 mV
    12.0 V                   12220 mV
```

**show chassis environment cb (EX8208 Switch)**

```
user@host> show chassis environment cb
CB 0 status:
  State                      Online Master
  Temperature Intake         20 degrees C / 68 degrees F
  Temperature Exhaust        24 degrees C / 75 degrees F
  Power 1
    1.1 V                     1086 mV
    1.2 V                     1179 mV
    1.2 V *                   1182 mV
    1.2 V *                   1182 mV
    1.25 V                    1211 mV
    1.5 V                     1466 mV
    1.8 V                     1759 mV
    2.5 V                     2455 mV
    3.3 V                     3261 mV
    3.3 V bias                3300 mV
    5.0 V                     4930 mV
    12.0 V                   11891 mV
  Power 2
    3.3 V bias *              3606 mV
    3.3 V bias *              3615 mV
    3.3 V bias *              3567 mV
    3.3 V bias *              3673 mV
    4.3 V bias *              4224 mV
    4.3 V bias *              4215 mV
    4.3 V bias *              4234 mV
    4.3 V bias *              4205 mV
    4.3 V bias *              4186 mV
    4.3 V bias *              4215 mV
    5.0 V bias                4940 mV
```

```
CB 1 status:
  State                       Online Standby
  Temperature Intake          19 degrees C / 66 degrees F
  Temperature Exhaust         23 degrees C / 73 degrees F
  Power 1
    1.1 V                      1086 mV
    1.2 V                      1169 mV
    1.2 V *                    1179 mV
    1.2 V *                    1179 mV
    1.25 V                     1211 mV
    1.5 V                      1479 mV
    1.8 V                      1759 mV
    2.5 V                      2475 mV
    3.3 V                      3235 mV
    3.3 V bias                 3306 mV
    5.0 V                      4930 mV
    12.0 V                    11891 mV
  Power 2
    3.3 V bias *               3644 mV
    3.3 V bias *               3664 mV
    3.3 V bias *               3586 mV
    3.3 V bias *               3654 mV
    4.3 V bias *               4215 mV
    4.3 V bias *               4224 mV
    4.3 V bias *               4215 mV
    4.3 V bias *               4215 mV
    4.3 V bias *               4234 mV
    4.3 V bias *               4224 mV
    5.0 V bias                 4920 mV
CB 2 status:
  State                       Online
  Temperature Intake          20 degrees C / 68 degrees F
  Temperature Exhaust         24 degrees C / 75 degrees F
  Power 1
    1.2 V                      1202 mV
    1.5 V                      1508 mV
    1.8 V                      1804 mV
    2.5 V                      2520 mV
    3.3 V                      3300 mV
    3.3 V bias                 3300 mV
    12.0 V                    12200 mV
```

## show chassis environment fpc

**Syntax**

show chassis environment fpc
<*slot*>

**Syntax (TX Matrix and TX Matrix Plus Router)**

show chassis environment fpc
<lcc *number*>
<*slot*>

**Syntax (MX Series Router)**

show chassis environment fpc
<*slot*>
<all-members>
<local>
<member *member-id*>

**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 the QFX Series.

**Description**

(M40e, M120, M160, M320, MX Series, T Series routers, EX Series, and QFX 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 switches 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**.
- 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).
  - 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.

**Required Privilege Level**

view

**List of Sample Output**

show chassis environment fpc (M120 Router) on page 270
show chassis environment fpc (M160 Router) on page 271
show chassis environment fpc (M320 Router) on page 272
show chassis environment fpc (MX240 Router) on page 272
show chassis environment fpc (MX480 Router) on page 273
show chassis environment fpc (MX960 Router) on page 274
show chassis environment fpc (T Series Core Routers) on page 275
show chassis environment fpc lcc (TX Matrix Router) on page 276
show chassis environment fpc lcc (TX Matrix Plus Router) on page 276
show chassis environment fpc (QFX Series) on page 277
show chassis environment fpc interconnect-device (QFabric Switches) on page 277

**Output Fields**

Table 25 on page 270 lists the output fields for the **show chassis environment fpc** command. Output fields are listed in the approximate order in which they appear.

### Table 25: show chassis environment fpc Output Fields

| Field Name | Field Description |
|---|---|
| **State** | Status of the FPC:<br>• **Unknown**—FPC is not detected by the router.<br>• **Empty**—No FPC is present.<br>• **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.<br>• **Ready**—FPC is in intermediate or transition state.<br>• **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.<br>• **Online**—FPC is online and running.<br>• **Offline**—FPC is powered down.<br>• **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. |
| **Temperature Intake** | (M320 routers 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 only) Temperature of the air flowing out of the chassis. |
| **Temperature Bottom** | (T Series routers only) Temperature of the air flowing past the bottom of the FPC. |
| **Temperature MMBO** | (T640 router only) Temperature of the air flowing past the type 3 FPC. |
| **Temperature MMB1** | (M320 and T Series routers only) Temperature of the air flowing past the type 1, type 2, and type 3 FPC. |
| **Power** | Information about the voltage supplied to the FPC. The left column displays the required power, in volts. The right column displays the measured power, in millivolts. |
| **CMB Revision** or **BUS revision** | Revision level of the chassis management bus device (M Series router) or bus (T Series routers). |

## Sample Output

**show chassis environment fpc (M120 Router)**

```
user@host> show chassis environment fpc
FPC 2 status:
  State                       Online
  Temperature Exhaust A       32 degrees C / 89 degrees F
  Temperature Exhaust B       31 degrees C / 87 degrees F
  Power A-Board
    1.2 V                      1202 mV
    1.5 V                      1508 mV
    1.8 V                      1798 mV
    2.5 V                      2507 mV
    3.3 V                      3351 mV
    5.0 V                      4995 mV
    3.3 V bias                 3296 mV
```

```
    1.2 V Rocket IO           1205 mV
    1.5 V Rocket IO           1501 mV
  I2C Slave Revision         12
FPC 3 status:
  State                      Online
  Temperature Exhaust A      31 degrees C / 87 degrees F
  Temperature Exhaust B      33 degrees C / 91 degrees F
  Power A-Board
    1.2 V                     1211 mV
    1.5 V                     1501 mV
    1.8 V                     1798 mV
    2.5 V                     2471 mV
    3.3 V                     3293 mV
    5.0 V                     4930 mV
    3.3 V bias                3296 mV
    1.2 V Rocket IO           1205 mV
    1.5 V Rocket IO           1501 mV
  Power B-Board
    1.2 V                     1214 mV
    1.5 V                     1501 mV
    2.5 V                     2471 mV
    3.3 V                     3300 mV
    5.0 V                     4943 mV
    3.3 V bias                3296 mV
    1.2 V Rocket IO           1205 mV
    1.5 V Rocket IO           1501 mV
  I2C Slave Revision         12
FPC 4 status:
  State                      Online
  Temperature Exhaust A      32 degrees C / 89 degrees F
  Temperature Exhaust B      30 degrees C / 86 degrees F
  Power A-Board
    1.2 V                     1195 mV
    1.5 V                     1504 mV
    1.8 V                     1801 mV
    2.5 V                     2504 mV
    3.3 V                     3293 mV
    5.0 V                     4917 mV
    3.3 V bias                3296 mV
    1.2 V Rocket IO           1202 mV
    1.5 V Rocket IO           1492 mV
  I2C Slave Revision         12
```

### show chassis environment fpc (M160 Router)

```
user@host> show chassis environment fpc
FPC 0 status:
  State                       Online
  Temperature               42 degrees C / 107 degrees F
  Power:
    1.5 V                1500 mV
    2.5 V                2509 mV
    3.3 V                3308 mV
    5.0 V                4991 mV
    5.0 V bias           4952 mV
    8.0 V bias           8307 mV
  CMB Revision              12
FPC 1 status:
  State                       Online
  Temperature               45 degrees C / 113 degrees F
  Power:
    1.5 V                1498 mV
    2.5 V                2501 mV
```

```
    3.3 V                3319 mV
    5.0 V                5020 mV
    5.0 V bias           5025 mV
    8.0 V bias           8307 mV
  CMB Revision             12
```

**show chassis environment fpc (M320 Router)**

```
user@host> show chassis environment fpc
FPC 0 status:
  State                          Online
  Temperature Intake          27 degrees C / 80 degrees F
  Temperature Exhaust         38 degrees C / 100 degrees F
  Temperature MMB1            31 degrees C / 87 degrees F
  Power:
    1.5 V                    1487 mV
    1.5 V *                  1494 mV
    1.8 V                    1821 mV
    2.5 V                    2533 mV
    3.3 V                    3323 mV
    5.0 V                    5028 mV
    3.3 V bias               3296 mV
    5.0 V bias               4984 mV
  CMB Revision                 16
FPC 1 status:
  State                          Online
  Temperature Intake          27 degrees C / 80 degrees F
  Temperature Exhaust         37 degrees C / 98 degrees F
  Temperature MMB1            32 degrees C / 89 degrees F
  Power:
    1.5 V                    1504 mV
    1.5 V *                  1499 mV
    1.8 V                    1820 mV
    2.5 V                    2529 mV
    3.3 V                    3328 mV
    5.0 V                    5013 mV
    3.3 V bias               3294 mV
    5.0 V bias               4984 mV
  CMB Revision                 16
FPC 2 status:
  State                          Online
  Temperature Intake          28 degrees C / 82 degrees F
  Temperature Exhaust         38 degrees C / 100 degrees F
  Temperature MMB1            32 degrees C / 89 degrees F
  Power:
    1.5 V                    1498 mV
    1.5 V *                  1487 mV
    1.8 V                    1816 mV
    2.5 V                    2531 mV
    3.3 V                    3324 mV
    5.0 V                    5025 mV
    3.3 V bias               3277 mV
    5.0 V bias               5013 mV
  CMB Revision                 17
FPC 3 status:
...
```

**show chassis environment fpc (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 (T Series Core Routers)

user@host> **show chassis environment fpc**

```
FPC 0 status:
  State                           Online
  Temperature Top               42 degrees C / 107 degrees F
  Temperature Bottom            36 degrees C / 96 degrees F
  Temperature MMB1              39 degrees C / 102 degrees F
  Power:
    1.8 V                     1959 mV
    2.5 V                     2495 mV
    3.3 V                     3344 mV
    5.0 V                     5047 mV
    1.8 V bias                1787 mV
    3.3 V bias                3291 mV
    5.0 V bias                4998 mV
    8.0 V bias                7343 mV
  BUS Revision                  40
FPC 1 status:
  State                           Online
  Temperature Top               42 degrees C / 107 degrees F
  Temperature Bottom            39 degrees C / 102 degrees F
  Temperature MMB1              40 degrees C / 104 degrees F
  Power:
    1.8 V                     1956 mV
    2.5 V                     2498 mV
    3.3 V                     3340 mV
    5.0 V                     5023 mV
    1.8 V bias                1782 mV
    3.3 V bias                3277 mV
    5.0 V bias                4989 mV
    8.0 V bias                7289 mV
  BUS Revision                  40
FPC 2 status:
  State                           Online
```

```
  Temperature Top             43 degrees C / 109 degrees F
  Temperature Bottom          39 degrees C / 102 degrees F
  Temperature MMB1            41 degrees C / 105 degrees F
  Power:
    1.8 V                   1963 mV
    2.5 V                   2503 mV
    3.3 V                   3340 mV
    5.0 V                   5042 mV
    1.8 V bias              1797 mV
    3.3 V bias              3311 mV
    5.0 V bias              5013 mV
    8.0 V bias              7221 mV
  BUS Revision                40
```

### show chassis environment fpc lcc (TX Matrix Router)

```
user@host> show chassis environment fpc lcc 0
lcc0-re0:
--------------------------------------------------------------------------
FPC 1 status:
  State                          Online
  Temperature Top             30 degrees C / 86 degrees F
  Temperature Bottom          25 degrees C / 77 degrees F
  Temperature MMB0               Absent
  Temperature MMB1            27 degrees C / 80 degrees F
  Power:
    1.8 V                   1813 mV
    2.5 V                   2504 mV
    3.3 V                   3338 mV
    5.0 V                   5037 mV
    1.8 V bias              1797 mV
    3.3 V bias              3301 mV
    5.0 V bias              5013 mV
    8.0 V bias              7345 mV
  BUS Revision                40
FPC 2 status:
  State                          Online
  Temperature Top             37 degrees C / 98 degrees F
  Temperature Bottom          26 degrees C / 78 degrees F
  Temperature MMB0            32 degrees C / 89 degrees F
  Temperature MMB1            27 degrees C / 80 degrees F
  Power:
    1.8 V                   1791 mV
    2.5 V                   2517 mV
    3.3 V                   3308 mV
    5.0 V                   5052 mV
    1.8 V bias              1797 mV
    3.3 V bias              3289 mV
    5.0 V bias              4991 mV
    8.0 V bias              7477 mV
  BUS Revision                40
```

### show chassis environment fpc lcc (TX Matrix Plus Router)

```
user@host> show chassis environment fpc lcc 0
lcc0-re0:
--------------------------------------------------------------------------
FPC 1 status:
  State                     Online
  Temperature Top           46 degrees C / 114 degrees F
  Temperature Bottom        47 degrees C / 116 degrees F
  Power
    1.8 V                    1788 mV
    1.8 V bias               1787 mV
    3.3 V                    3321 mV
```

```
    3.3 V bias                 3306 mV
    5.0 V bias                 5018 mV
    5.0 V TOP                  5037 mV
    8.0 V bias                 7223 mV
  Power (Base/PMB/MMB)
    1.2 V                      1205 mV
    1.5 V                      1503 mV
    5.0 V BOT                  5084 mV
    12.0 V TOP Base           11775 mV
    12.0 V BOT Base           11794 mV
    1.1 V PMB                  1108 mV
    1.2 V PMB                  1196 mV
    1.5 V PMB                  1499 mV
    1.8 V PMB                  1811 mV
    2.5 V PMB                  2515 mV
    3.3 V PMB                  3318 mV
    5.0 V PMB                  5030 mV
    12.0  V PMB               11832 mV
    0.75 MMB TOP                752 mV
    1.5 V MMB TOP              1489 mV
    1.8 V MMB TOP              1782 mV
    2.5 V MMB TOP              2498 mV
    1.2 V MMB TOP              1155 mV
    5.0 V MMB TOP              4902 mV
    12.0 V MMB TOP            11721 mV
    3.3 V MMB TOP              3316 mV
    0.75 MMB BOT                754 mV
    1.5 V MMB BOT              1482 mV
    1.8 V MMB BOT              1758 mV
    2.5 V MMB BOT              2488 mV
    1.2 V MMB BOT              1157 mV
    5.0 V MMB BOT              4962 mV
    12.0 V MMB BOT            11691 mV
    3.3 V MMB BOT              3308 mV
    APS 00                     1484 mV
    APS 01                     2503 mV
    APS 02                     3313 mV
    5.0 V PIC 0                5025 mV
    APS 10                     1501 mV
    APS 11                     2466 mV
    APS 12                     3311 mV
    5.0 V PIC 1                5081 mV
  Bus Revision                49
```

**show chassis environment fpc (QFX Series)**

```
user@switch> show chassis environment fpc 0
FPC 0 status:
  State                       Online
  Temperature                 42 degrees C / 107 degrees F
```

**show chassis environment fpc interconnect-device (QFabric Switches)**

```
user@switch> show chassis environment fpc interconnect-device interconnect1 0
FC 0 FPC 0 status:
  State                       Online
  Left Intake Temperature     24 degrees C / 75 degrees F
  Right Intake Temperature    24 degrees C / 75 degrees F
  Left Exhaust Temperature    27 degrees C / 80 degrees F
  Right Exhaust Temperature   27 degrees C / 80 degrees F
  Power
    BIAS 3V3                   3330 mV
    VDD 3V3                    3300 mV
    VDD 2V5                    2502 mV
    VDD 1V5                    1496 mV
```

```
VDD 1V2                    1194 mV
VDD 1V0                    1000 mV
SW0 VDD  1V0               1020 mV
SW0 CVDD 1V025             1032 mV
SW1 VDD  1V0               1022 mV
SW1 CVDD 1V025             1030 mV
VDD 12V0 DIV3_33           3414 mV
```

## show chassis environment fpm

**Syntax**

show chassis environment fpm

**Syntax (TX Matrix Router)**

show chassis environment fpm
<lcc *number* | scc>

**Syntax (TX Matrix Plus Router)**

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.

**Description**

(M40e, M120, M160, M320, MX Series, and T Series routers 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

**List of Sample Output**

show chassis environment fpm (M40e and M160 Routers) on page 280
show chassis environment fpm (M320 Router) on page 280
show chassis environment fpm (MX240 Router) on page 281
show chassis environment fpm (MX480 Router) on page 281
show chassis environment fpm (T Series Routers) on page 281
show chassis environment fpm lcc (TX Matrix Router) on page 281
show chassis environment fpm scc (TX Matrix Router) on page 281
show chassis environment fpm sfc (TX Matrix Plus Router) on page 282

**Output Fields** Table 26 on page 280 lists the output fields for the **show chassis environment fpm** command. Output fields are listed in the approximate order in which they appear.

### Table 26: show chassis environment fpm Output Fields

| Field Name | Field Description |
|---|---|
| **State** | FPM status:<br>• **Online**—FPM is online and running.<br>• **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 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 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. |

## Sample Output

**show chassis environment fpm (M40e and M160 Routers)**

```
user@host> show chassis environment fpm
FPM status:
  State                        Online
  FPM CMB Voltage:
    5.0 V bias            5030 mV
    8.0 V bias            8083 mV
  FPM Display Voltage:
    5.0 V bias            4998 mV
  FPM CMB temperature      34 degrees C / 93 degrees F
  FPM Display temperature  35 degrees C / 95 degrees F
  CMB Revision             12
```

**show chassis environment fpm (M320 Router)**

```
user@host> show chassis environment fpm
FPM status:
  State                            Online
  FPM GBUS Voltage:
    5.0 V                     5006 mV
    1.8 V bias                1799 mV
```

```
    3.3 V bias              3294 mV
    5.0 V bias              4998 mV
    8.0 V bias              7682 mV
  FPM GBUS temperature        30 degrees C / 86 degrees F
  GBUS Revision               51
```

**show chassis environment fpm (MX240 Router)**

```
user@host> show chassis environment fpm
FPM status:
  State                     Online
  I2CS Revision             41
```

**show chassis environment fpm (MX480 Router)**

```
user@host> show chassis environment fpm
FPM status:
  State                     Online
  I2CS Revision             41
```

**show chassis environment fpm (T Series Routers)**

```
user@host> show chassis environment fpm
FPM status:
  State                          Online
  FPM GBUS Voltage:
    1.8 V bias              1787 mV
    3.3 V bias              3286 mV
    5.0 V bias              4991 mV
    8.0 V bias              7162 mV
  FPM Display Voltage:
    5.0 V                   4996 mV
  FPM GBUS temperature        29 degrees C / 84 degrees F
  FPM Display temperature     26 degrees C / 78 degrees F
  GBUS Revision               37
```

**show chassis environment fpm lcc (TX Matrix Router)**

```
user@host> show chassis environment fpm lcc 0
lcc0-re0:
--------------------------------------------------------------------------
FPM status:
  State                          Online
  FPM GBUS Voltage:
    1.8 V bias              1797 mV
    3.3 V bias              3294 mV
    5.0 V bias              5015 mV
    8.0 V bias              7470 mV
  FPM Display Voltage:
    5.0 V                   5018 mV
  FPM GBUS temperature        25 degrees C / 77 degrees F
  FPM Display temperature     29 degrees C / 84 degrees F
  GBUS Revision               37
```

**show chassis environment fpm scc (TX Matrix Router)**

```
user@host> show chassis environment fpm scc
scc-re0:
--------------------------------------------------------------------------
FPM status:
  State                          Online
  FPM GBUS Voltage:
    1.8 V bias              1789 mV
    3.3 V bias              3296 mV
    5.0 V bias              5003 mV
    8.0 V bias              7592 mV
  FPM Display Voltage:
    5.0 V                   5010 mV
  FPM GBUS temperature        22 degrees C / 71 degrees F
```

```
  FPM Display temperature      27 degrees C / 80 degrees F
  GBUS Revision                37
```

**show chassis environment fpm sfc (TX Matrix Plus Router)**

```
user@host> show chassis environment fpm sfc

sfc0-re0:
--------------------------------------------------------------------------
FPM status:
  State                       Online
  FPM I2CS Voltage:
    3.3 V                      3300 mV
    5.0 V                      5001 mV
    9.0 V FPD                  8672 mV
  FPM I2CS temperature        33 degrees C / 91 degrees F
  I2CS Revision               69

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 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

**List of Sample Output**
show chassis environment mcs (M40e Router) on page 284
show chassis environment mcs (M160 Router) on page 284

**Output Fields** Table 27 on page 283 lists the output fields for the **show chassis environment mcs** command. Output fields are listed in the approximate order in which they appear.

### Table 27: show chassis environment mcs Output Fields

| Field Name | Field Description |
|---|---|
| **State** | Status of the MCS:<br>• **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.<br>• **Online**—MCS is online and running.<br>• **Offline**—MCS is powered down.<br>• **Empty**—No MCS is present.<br>• **Master**—MCS is online, operating as master.<br>• **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

**Syntax**

show chassis environment

**Syntax (TX Matrix Router)**

show chassis environment
<lcc *number* | scc>

**Syntax (TX Matrix Plus Router)**

show chassis environment
<lcc *number* | sfc *number*>

**Syntax (MX Series Router)**

show chassis environment
<all-members>
<local>
<member *member-id*>

**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 *nameslot-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 the QFX Series.

**Description**

Display environmental information about the router or switch chassis, including the temperature and information about the fans, power supplies, and Routing Engine.

**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 only) (Optional) Display chassis environmental information for all the members of the Virtual Chassis configuration.

cb interconnect-device *name*—(QFabric switches only) (Optional) Display chassis environmental information for the Control Board on an Interconnect device.

fpc *fpc-slot*—(QFX3500 switches and QFabric Switches) (Optional) On the QFX3500 switch, display chassis environmental information for a specified Flexible PIC Concentrator. Replace ***slot-number*** with **0**. On a QFabric switch, display chassis environment information for a specified Flexible PIC Concentrator on an Interconnect device.

interconnect-device *name*—(QFabric switches 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 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 only) (Optional) Display chassis environmental information for the local Virtual Chassis member.

member *member-id*—(MX Series routers only) (Optional) Display chassis environmental information for the specified member of the Virtual Chassis configuration. Replace ***member-id*** with a value of 0 or 1.

node-device *name*—(QFabric switches only) (Optional) Display chassis environmental information for the Node device.

pem—(QFX3500 switches and QFabric Switches) (Optional) Display chassis environmental information for the Power Entry Module on the specified Interconnect device or Node device.

routing-engine—(QFX3500 switches and QFabric Switches) (Optional) Display chassis environmental information for the Routing Engine on the specified Interconnect device.

scc—(TX Matrix routers only) (Optional) Display chassis environmental information about the TX Matrix router (or switch-card chassis).

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**.

**Required Privilege Level**

view

**Related Documentation**


- show chassis environment cb on page 255
- show chassis environment cip
- show chassis environment fpc on page 268
- show chassis environment fpm on page 279
- show chassis environment mcs on page 283
- show chassis environment pcg on page 307
- show chassis environment pem on page 309
- show chassis environment routing-engine on page 315


**List of Sample Output**

show chassis environment (J2300 Router) on page 288
show chassis environment (J4300 or J6300 Router) on page 288
show chassis environment (M5 Router) on page 288

show chassis environment (M7i Router) on page 288
show chassis environment (M10 Router) on page 288
show chassis environment (M10i Router) on page 289
show chassis environment (M20 Router) on page 289
show chassis environment (M40 Router) on page 289
show chassis environment (M40e Router) on page 290
show chassis environment (M120 Router) on page 290
show chassis environment (M160 Router) on page 291
show chassis environment (M320 Router) on page 292
show chassis environment (MX240 Router) on page 292
show chassis environment (MX240 Router with Enhanced MX SCB) on page 293
show chassis environment (MX480 Router) on page 294
show chassis environment (MX480 Router with Enhanced MX SCB) on page 295
show chassis environment (MX960 Router) on page 296
show chassis environment (MX960 Router with Enhanced MX SCB) on page 297
show chassis environment (T320 Router) on page 299
show chassis environment (T640 Router) on page 300
show chassis environment (TX Matrix Router) on page 301
show chassis environment (T1600 Router) on page 302
show chassis environment (TX Matrix Plus Router) on page 303
show chassis environment (EX4200 Standalone Switch) on page 306
show chassis environment (QFX Series) on page 306
show chassis environment node-device (QFabric Switch) on page 306

**Output Fields** Table 23 on page 235 lists the output fields for the **show chassis environment** command. Output fields are listed in the approximate order in which they appear.

### Table 28: show chassis environment Output Fields

| Field Name | Field Description |
|---|---|
| **Power** | Power information:<br>• (M5, M10, M20, and M40 routers and EX Series switches only) Power supply status: **OK**, **Testing**, (during initial power-on), **Failed**, or **Absent**.<br>• (M7i, M10i, M40e, M120, M160, M320, T Series routers and EX Series switches only) Power Entry Modules status: **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). |
| **Fan** | Fan status: **OK**, **Testing** (during initial power-on), **Failed**, or **Absent**. **Measurement** indicates if fans are spinning at normal or high speed. |
| **Misc** | Information about other components of the chassis:<br>• On some routers, this field indicates the status of one or more additional components.<br>• On the M160 router, **Misc** includes **CIP** (Connector Interface Panel). **OK** indicates the CIP is present.<br>• On the T640 router, **Misc** includes **CIP** and **SPMB** (Switch Processor Mezzanine Board). **OK** indicates the item is present. |

## 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
```

**show chassis environment (M40 Router)**

```
user@host> show chassis environment
Class Item                  Status     Measurement
Power Power Supply A        OK
      Power Supply B        Absent
Temp  FPC 3                 OK         24 degrees C / 75 degrees F
```

```
      FPC 6                  OK         26 degrees C / 78 degrees F
      SCB                    OK         26 degrees C / 78 degrees F
      Backplane @ A1         OK         28 degrees C / 82 degrees F
      Backplane @ A2         OK         23 degrees C / 73 degrees F
      Routing Engine         OK         26 degrees C / 78 degrees F
Fans  Top Impeller           OK         Spinning at normal speed
      Bottom impeller        OK         Spinning at normal speed
      Rear Left Fan          OK         Spinning at normal speed
      Rear Center Fan        OK         Spinning at normal speed
      Rear Right Fan         OK         Spinning at normal speed
Misc  Craft Interface        OK
```

**show chassis environment (M40e Router)**

```
user@host> show chassis environment
Class Item                   Status     Measurement
Power PEM 0                  OK
      PEM 1                  Absent
Temp  PCG 0                  OK         44 degrees C / 111 degrees F
      PCG 1                  OK         47 degrees C / 116 degrees F
      Routing Engine 0       OK         40 degrees C / 104 degrees F
      Routing Engine 1       OK         37 degrees C / 98 degrees F
      MCS 0                  OK         45 degrees C / 113 degrees F
      MCS 1                  OK         42 degrees C / 107 degrees F
      SFM 0 SPP              OK         40 degrees C / 104 degrees F
      SFM 0 SPR              OK         44 degrees C / 111 degrees F
      SFM 1 SPP              OK         43 degrees C / 109 degrees F
      SFM 1 SPR              OK         45 degrees C / 113 degrees F
      FPC 0                  OK         38 degrees C / 100 degrees F
      FPC 1                  OK         40 degrees C / 104 degrees F
      FPC 2                  OK         38 degrees C / 100 degrees F
      FPC 4                  OK         34 degrees C / 93 degrees F
      FPC 5                  OK         43 degrees C / 109 degrees F
      FPC 6                  OK         41 degrees C / 105 degrees F
      FPC 7                  OK         43 degrees C / 109 degrees F
      FPM CMB                OK         28 degrees C / 82 degrees F
      FPM Display            OK         28 degrees C / 82 degrees F
Fans  Rear Bottom Blower     OK         Spinning at normal speed
      Rear Top Blower        OK         Spinning at normal speed
      Front Top Blower       OK         Spinning at normal speed
      Fan Tray Rear Left     OK         Spinning at normal speed
      Fan Tray Rear Right    OK         Spinning at normal speed
      Fan Tray Front Left    OK         Spinning at normal speed
      Fan Tray Front Right   OK         Spinning at normal speed
Misc  CIP                    OK
```

**show chassis environment (M120 Router)**

```
user@host> show chassis environment
Class Item                           Status     Measurement
Temp  PEM 0                          OK
      PEM 1                          OK
      Routing Engine 0               OK         43 degrees C / 109 degrees F
      Routing Engine 1               OK         44 degrees C / 111 degrees F
      CB 0 Intake                    OK         33 degrees C / 91 degrees F
      CB 0 Exhaust A                 OK         36 degrees C / 96 degrees F
      CB 0 Exhaust B                 OK         35 degrees C / 95 degrees F
      CB 1 Intake                    OK         34 degrees C / 93 degrees F
      CB 1 Exhaust A                 OK         38 degrees C / 100 degrees F
      CB 1 Exhaust B                 OK         35 degrees C / 95 degrees F
      FEB 3 Intake                   OK         35 degrees C / 95 degrees F
      FEB 3 Exhaust A                OK         37 degrees C / 98 degrees F
      FEB 3 Exhaust B                OK         39 degrees C / 102 degrees F
```

```
      FEB 4 Intake                  OK          33 degrees C / 91 degrees F
      FEB 4 Exhaust A               OK          39 degrees C / 102 degrees F
      FEB 4 Exhaust B               OK          36 degrees C / 96 degrees F
      FPC 2 Exhaust A               OK          32 degrees C / 89 degrees F
      FPC 2 Exhaust B               OK          31 degrees C / 87 degrees F
      FPC 3 Exhaust A               OK          32 degrees C / 89 degrees F
      FPC 3 Exhaust B               OK          33 degrees C / 91 degrees F
      FPC 4 Exhaust A               OK          32 degrees C / 89 degrees F
      FPC 4 Exhaust B               OK          30 degrees C / 86 degrees F
Fans  Front Top Tray Fan 1          OK          Spinning at normal speed
      Front Top Tray Fan 2          OK          Spinning at normal speed
      Front Top Tray Fan 3          OK          Spinning at normal speed
      Front Top Tray Fan 4          OK          Spinning at normal speed
      Front Top Tray Fan 5          OK          Spinning at normal speed
      Front Top Tray Fan 6          OK          Spinning at normal speed
      Front Top Tray Fan 7          OK          Spinning at normal speed
      Front Top Tray Fan 8          OK          Spinning at normal speed
      Front Bottom Tray Fan 1       OK          Spinning at normal speed
      Front Bottom Tray Fan 2       OK          Spinning at normal speed
      Front Bottom Tray Fan 3       OK          Spinning at normal speed
      Front Bottom Tray Fan 4       OK          Spinning at normal speed
      Front Bottom Tray Fan 5       OK          Spinning at normal speed
      Front Bottom Tray Fan 6       OK          Spinning at normal speed
      Front Bottom Tray Fan 7       OK          Spinning at normal speed
      Front Bottom Tray Fan 8       OK          Spinning at normal speed
      Rear Top Tray Fan 1           OK          Spinning at normal speed
      Rear Top Tray Fan 2           OK          Spinning at normal speed
      Rear Top Tray Fan 3           OK          Spinning at normal speed
      Rear Top Tray Fan 4           OK          Spinning at normal speed
      Rear Top Tray Fan 5           OK          Spinning at normal speed
      Rear Top Tray Fan 6           OK          Spinning at normal speed
      Rear Top Tray Fan 7           OK          Spinning at normal speed
      Rear Top Tray Fan 8           OK          Spinning at normal speed
      Rear Bottom Tray Fan 1        OK          Spinning at normal speed
      Rear Bottom Tray Fan 2        OK          Spinning at normal speed
      Rear Bottom Tray Fan 3        OK          Spinning at normal speed
      Rear Bottom Tray Fan 4        OK          Spinning at normal speed
      Rear Bottom Tray Fan 5        OK          Spinning at normal speed
      Rear Bottom Tray Fan 6        OK          Spinning at normal speed
      Rear Bottom Tray Fan 7        OK          Spinning at normal speed
      Rear Bottom Tray Fan 8        OK          Spinning at normal speed
```

**show chassis environment (M160 Router)**

```
user@host> show chassis environment
Class Item                    Status     Measurement
Power PEM 0                   OK           PEM 1                  Absent
Temp  PCG 0                   OK         45 degrees C / 113 degrees F
      PCG 1                   Absent
      Routing Engine 0        OK         35 degrees C / 95 degrees F
      Routing Engine 1        Absent
      MCS 0                   OK         50 degrees C / 122 degrees F
      SFM 0 SPP               OK         47 degrees C / 116 degrees F
      SFM 0 SPR               OK         49 degrees C / 120 degrees F
      SFM 1 SPP               OK         50 degrees C / 122 degrees F
      SFM 1 SPR               OK         50 degrees C / 122 degrees F
      SFM 2 SPP               OK         51 degrees C / 123 degrees F
      SFM 2 SPR               OK         52 degrees C / 125 degrees F
      SFM 3 SPP               OK         52 degrees C / 125 degrees F
      SFM 3 SPR               OK         48 degrees C / 118 degrees F
      FPC 0                   OK         45 degrees C / 113 degrees F
      FPC 6                   OK         43 degrees C / 109 degrees F
      FPM CMB                 OK         31 degrees C / 87 degrees F
```

```
      FPM Display            OK         33 degrees C / 91 degrees F
Fans  Rear Bottom Blower     OK         Spinning at normal speed
      Rear Top Blower        OK         Spinning at normal speed
      Front Top Blower       OK         Spinning at normal speed
      Fan Tray Rear Left     OK         Spinning at normal speed
      Fan Tray Rear Right    OK         Spinning at normal speed
      Fan Tray Front Left    OK         Spinning at normal speed
      Fan Tray Front Right   OK         Spinning at normal speed
Misc  CIP                    OK
```

**show chassis environment (M320 Router)**

```
user@host> show chassis environment
Class Item                   Status     Measurement
Temp  PEM 0                  Absent
      PEM 1                  Absent
      PEM 2                  OK
      PEM 3                  OK
      Routing Engine 0       OK         33 degrees C / 91 degrees F
      Routing Engine 1       OK         32 degrees C / 89 degrees F
      CB 0                   OK         36 degrees C / 96 degrees F
      CB 1                   OK         36 degrees C / 96 degrees F
      SIB 0                  OK         38 degrees C / 100 degrees F
      SIB 1                  OK         29 degrees C / 84 degrees F
      SIB 2                  OK         38 degrees C / 100 degrees F
      SIB 3                  OK         41 degrees C / 105 degrees F
      FPC 0 Intake           OK         28 degrees C / 82 degrees F
      FPC 0 Exhaust          OK         40 degrees C / 104 degrees F
      FPC 1 Intake           OK         29 degrees C / 84 degrees F
      FPC 1 Exhaust          OK         39 degrees C / 102 degrees F
      FPC 2 Intake           OK         28 degrees C / 82 degrees F
      FPC 2 Exhaust          OK         38 degrees C / 100 degrees F
      FPC 3 Intake           OK         28 degrees C / 82 degrees F
      FPC 3 Exhaust          OK         39 degrees C / 102 degrees F
      FPC 6 Intake           OK         27 degrees C / 80 degrees F
      FPC 6 Exhaust          OK         39 degrees C / 102 degrees F
      FPC 7 Intake           OK         27 degrees C / 80 degrees F
      FPC 7 Exhaust          OK         42 degrees C / 107 degrees F
      FPM GBUS               OK         30 degrees C / 86 degrees F
Fan   Top Left Front fan     OK         Spinning at normal speed
      Top Right Rear fan     OK         Spinning at normal speed
      Top Right Front fan    OK         Spinning at normal speed
      Top Left Rear fan      OK         Spinning at normal speed
      Bottom Left Front fan  OK         Spinning at normal speed
      Bottom Right Rear fan  OK         Spinning at normal speed
      Bottom Right Front fan OK         Spinning at normal speed
      Bottom Left Rear fan   OK         Spinning at normal speed
      Rear Fan 1 (TOP)       OK         Spinning at normal speed
      Rear Fan 2             OK         Spinning at normal speed
      Rear Fan 3             OK         Spinning at normal speed
      Rear Fan 4             OK         Spinning at normal speed
      Rear Fan 5             OK         Spinning at normal speed
      Rear Fan 6             OK         Spinning at normal speed
      Rear Fan 7 (Bottom)    OK         Spinning at normal speed
Misc  CIP                    OK
```

**show chassis environment (MX240 Router)**

```
user@host> show chassis environment
Class Item                           Status     Measurement
Temp  PEM 0                          OK         40 degrees C / 104 degrees F
      PEM 1                          OK         45 degrees C / 113 degrees F
      PEM 2                          Absent
```

```
      PEM 3                          Absent
      Routing Engine 0               OK         39 degrees C / 102 degrees F
      Routing Engine 1               OK         37 degrees C / 98 degrees F
      CB 0 Intake                    OK         36 degrees C / 96 degrees F
      CB 0 Exhaust A                 OK         34 degrees C / 93 degrees F
      CB 0 Exhaust B                 OK         38 degrees C / 100 degrees F
      CB 0 ACBC                      OK         37 degrees C / 98 degrees F
      CB 0 SF A                      OK         49 degrees C / 120 degrees F
      CB 0 SF B                      OK         41 degrees C / 105 degrees F
      CB 1 Intake                    OK         37 degrees C / 98 degrees F
      CB 1 Exhaust A                 OK         34 degrees C / 93 degrees F
      CB 1 Exhaust B                 OK         39 degrees C / 102 degrees F
      CB 1 ACBC                      OK         38 degrees C / 100 degrees F
      CB 1 SF A                      OK         47 degrees C / 116 degrees F
      CB 1 SF B                      OK         41 degrees C / 105 degrees F
      FPC 1 Intake                   OK         33 degrees C / 91 degrees F
      FPC 1 Exhaust A                OK         38 degrees C / 100 degrees F
      FPC 1 Exhaust B                OK         53 degrees C / 127 degrees F
      FPC 1 I3 0 TSensor             OK         50 degrees C / 122 degrees F
      FPC 1 I3 0 Chip                OK         53 degrees C / 127 degrees F
      FPC 1 I3 1 TSensor             OK         49 degrees C / 120 degrees F
      FPC 1 I3 1 Chip                OK         52 degrees C / 125 degrees F
      FPC 1 I3 2 TSensor             OK         47 degrees C / 116 degrees F
      FPC 1 I3 2 Chip                OK         49 degrees C / 120 degrees F
      FPC 1 I3 3 TSensor             OK         44 degrees C / 111 degrees F
      FPC 1 I3 3 Chip                OK         46 degrees C / 114 degrees F
      FPC 1 IA 0 TSensor             OK         45 degrees C / 113 degrees F
      FPC 1 IA 0 Chip                OK         44 degrees C / 111 degrees F
      FPC 1 IA 1 TSensor             OK         44 degrees C / 111 degrees F
      FPC 1 IA 1 Chip                OK         48 degrees C / 118 degrees F
      FPC 2 Intake                   OK         32 degrees C / 89 degrees F
      FPC 2 Exhaust A                OK         40 degrees C / 104 degrees F
      FPC 2 Exhaust B                OK         52 degrees C / 125 degrees F
      FPC 2 I3 0 TSensor             OK         52 degrees C / 125 degrees F
      FPC 2 I3 0 Chip                OK         56 degrees C / 132 degrees F
      FPC 2 I3 1 TSensor             OK         52 degrees C / 125 degrees F
      FPC 2 I3 1 Chip                OK         55 degrees C / 131 degrees F
      FPC 2 I3 2 TSensor             OK         49 degrees C / 120 degrees F
      FPC 2 I3 2 Chip                OK         52 degrees C / 125 degrees F
      FPC 2 I3 3 TSensor             OK         44 degrees C / 111 degrees F
      FPC 2 I3 3 Chip                OK         48 degrees C / 118 degrees F
      FPC 2 IA 0 TSensor             OK         50 degrees C / 122 degrees F
      FPC 2 IA 0 Chip                OK         48 degrees C / 118 degrees F
      FPC 2 IA 1 TSensor             OK         47 degrees C / 116 degrees F
      FPC 2 IA 1 Chip                OK         53 degrees C / 127 degrees F
Fans  Front Fan                      OK         Spinning at normal speed
      Middle Fan                     OK         Spinning at normal speed
      Rear Fan                       OK         Spinning at normal speed
```

**show chassis environment (MX240 Router with Enhanced MX SCB)**

```
user@host> show chassis environment
Class Item                           Status     Measurement
Temp  PEM 0                          OK         40 degrees C / 104 degrees F
      PEM 1                          OK         45 degrees C / 113 degrees F
      PEM 2                          Absent
      PEM 3                          Absent
      Routing Engine 0               OK         39 degrees C / 102 degrees F
      Routing Engine 1               OK         37 degrees C / 98 degrees F
      CB 0 Intake                    OK         36 degrees C / 96 degrees F
      CB 0 Exhaust A                 OK         34 degrees C / 93 degrees F
      CB 0 Exhaust B                 OK         38 degrees C / 100 degrees F
      CB 0 ACBC                      OK         37 degrees C / 98 degrees F
```

```
      CB 0 XF A                      OK         49 degrees C / 120 degrees F
      CB 0 XF B                      OK         41 degrees C / 105 degrees F
      CB 1 Intake                    OK         37 degrees C / 98 degrees F
      CB 1 Exhaust A                 OK         34 degrees C / 93 degrees F
      CB 1 Exhaust B                 OK         39 degrees C / 102 degrees F
      CB 1 ACBC                      OK         38 degrees C / 100 degrees F
      CB 1 XF A                      OK         47 degrees C / 116 degrees F
      CB 1 XF B                      OK         41 degrees C / 105 degrees F
      FPC 1 Intake                   OK         33 degrees C / 91 degrees F
      FPC 1 Exhaust A                OK         38 degrees C / 100 degrees F
      FPC 1 Exhaust B                OK         53 degrees C / 127 degrees F
      FPC 1 I3 0 TSensor             OK         50 degrees C / 122 degrees F
      FPC 1 I3 0 Chip                OK         53 degrees C / 127 degrees F
      FPC 1 I3 1 TSensor             OK         49 degrees C / 120 degrees F
      FPC 1 I3 1 Chip                OK         52 degrees C / 125 degrees F
      FPC 1 I3 2 TSensor             OK         47 degrees C / 116 degrees F
      FPC 1 I3 2 Chip                OK         49 degrees C / 120 degrees F
      FPC 1 I3 3 TSensor             OK         44 degrees C / 111 degrees F
      FPC 1 I3 3 Chip                OK         46 degrees C / 114 degrees F
      FPC 1 IA 0 TSensor             OK         45 degrees C / 113 degrees F
      FPC 1 IA 0 Chip                OK         44 degrees C / 111 degrees F
      FPC 1 IA 1 TSensor             OK         44 degrees C / 111 degrees F
      FPC 1 IA 1 Chip                OK         48 degrees C / 118 degrees F
      FPC 2 Intake                   OK         32 degrees C / 89 degrees F
      FPC 2 Exhaust A                OK         40 degrees C / 104 degrees F
      FPC 2 Exhaust B                OK         52 degrees C / 125 degrees F
      FPC 2 I3 0 TSensor             OK         52 degrees C / 125 degrees F
      FPC 2 I3 0 Chip                OK         56 degrees C / 132 degrees F
      FPC 2 I3 1 TSensor             OK         52 degrees C / 125 degrees F
      FPC 2 I3 1 Chip                OK         55 degrees C / 131 degrees F
      FPC 2 I3 2 TSensor             OK         49 degrees C / 120 degrees F
      FPC 2 I3 2 Chip                OK         52 degrees C / 125 degrees F
      FPC 2 I3 3 TSensor             OK         44 degrees C / 111 degrees F
      FPC 2 I3 3 Chip                OK         48 degrees C / 118 degrees F
      FPC 2 IA 0 TSensor             OK         50 degrees C / 122 degrees F
      FPC 2 IA 0 Chip                OK         48 degrees C / 118 degrees F
      FPC 2 IA 1 TSensor             OK         47 degrees C / 116 degrees F
      FPC 2 IA 1 Chip                OK         53 degrees C / 127 degrees F
Fans  Front Fan                      OK         Spinning at normal speed
      Middle Fan                     OK         Spinning at normal speed
      Rear Fan                       OK         Spinning at normal speed
```

### show chassis environment (MX480 Router)

```
user@host> show chassis environment
Class Item                           Status     Measurement
Temp  PEM 0                          OK         35 degrees C / 95 degrees F
      PEM 1                          OK         40 degrees C / 104 degrees F
      PEM 2                          Absent
      PEM 3                          Absent
      Routing Engine 0               OK         44 degrees C / 111 degrees F
      Routing Engine 1               OK         45 degrees C / 113 degrees F
      CB 0 Intake                    OK         36 degrees C / 96 degrees F
      CB 0 Exhaust A                 OK         38 degrees C / 100 degrees F
      CB 0 Exhaust B                 OK         39 degrees C / 102 degrees F
      CB 0 ACBC                      OK         37 degrees C / 98 degrees F
      CB 0 SF A                      OK         51 degrees C / 123 degrees F
      CB 0 SF B                      OK         44 degrees C / 111 degrees F
      CB 1 Intake                    OK         36 degrees C / 96 degrees F
      CB 1 Exhaust A                 OK         39 degrees C / 102 degrees F
      CB 1 Exhaust B                 OK         40 degrees C / 104 degrees F
      CB 1 ACBC                      OK         37 degrees C / 98 degrees F
      CB 1 SF A                      OK         50 degrees C / 122 degrees F
```

```
      CB 1 SF B                      OK         43 degrees C / 109 degrees F
      FPC 0 Intake                   OK         36 degrees C / 96 degrees F
      FPC 0 Exhaust A                OK         39 degrees C / 102 degrees F
      FPC 0 Exhaust B                OK         51 degrees C / 123 degrees F
      FPC 0 I3 0 TSensor             OK         49 degrees C / 120 degrees F
      FPC 0 I3 0 Chip                OK         56 degrees C / 132 degrees F
      FPC 0 I3 1 TSensor             OK         47 degrees C / 116 degrees F
      FPC 0 I3 1 Chip                OK         52 degrees C / 125 degrees F
      FPC 0 I3 2 TSensor             OK         46 degrees C / 114 degrees F
      FPC 0 I3 2 Chip                OK         48 degrees C / 118 degrees F
      FPC 0 I3 3 TSensor             OK         42 degrees C / 107 degrees F
      FPC 0 I3 3 Chip                OK         45 degrees C / 113 degrees F
      FPC 0 IA 0 TSensor             OK         45 degrees C / 113 degrees F
      FPC 0 IA 0 Chip                OK         45 degrees C / 113 degrees F
      FPC 0 IA 1 TSensor             OK         44 degrees C / 111 degrees F
      FPC 0 IA 1 Chip                OK         48 degrees C / 118 degrees F
      FPC 1 Intake                   OK         37 degrees C / 98 degrees F
      FPC 1 Exhaust A                OK         41 degrees C / 105 degrees F
      FPC 1 Exhaust B                OK         52 degrees C / 125 degrees F
      FPC 1 I3 0 TSensor             OK         51 degrees C / 123 degrees F
      FPC 1 I3 0 Chip                OK         57 degrees C / 134 degrees F
      FPC 1 I3 1 TSensor             OK         48 degrees C / 118 degrees F
      FPC 1 I3 1 Chip                OK         52 degrees C / 125 degrees F
      FPC 1 I3 2 TSensor             OK         46 degrees C / 114 degrees F
      FPC 1 I3 2 Chip                OK         50 degrees C / 122 degrees F
      FPC 1 I3 3 TSensor             OK         42 degrees C / 107 degrees F
      FPC 1 I3 3 Chip                OK         46 degrees C / 114 degrees F
      FPC 1 IA 0 TSensor             OK         49 degrees C / 120 degrees F
      FPC 1 IA 0 Chip                OK         48 degrees C / 118 degrees F
      FPC 1 IA 1 TSensor             OK         46 degrees C / 114 degrees F
      FPC 1 IA 1 Chip                OK         50 degrees C / 122 degrees F
Fans  Top Rear Fan                   OK         Spinning at normal speed
      Bottom Rear Fan                OK         Spinning at normal speed
      Top Middle Fan                 OK         Spinning at normal speed
      Bottom Middle Fan              OK         Spinning at normal speed
      Top Front Fan                  OK         Spinning at normal speed
      Bottom Front Fan               OK         Spinning at normal speed
```

### show chassis environment (MX480 Router with Enhanced MX SCB)

```
user@host> show chassis environment
Class Item                           Status     Measurement
Temp  PEM 0                          OK         35 degrees C / 95 degrees F
      PEM 1                          OK         40 degrees C / 104 degrees F
      PEM 2                          Absent
      PEM 3                          Absent
      Routing Engine 0               OK         44 degrees C / 111 degrees F
      Routing Engine 1               OK         45 degrees C / 113 degrees F
      CB 0 Intake                    OK         36 degrees C / 96 degrees F
      CB 0 Exhaust A                 OK         38 degrees C / 100 degrees F
      CB 0 Exhaust B                 OK         39 degrees C / 102 degrees F
      CB 0 ACBC                      OK         37 degrees C / 98 degrees F
      CB 0 XF A                      OK         51 degrees C / 123 degrees F
      CB 0 XF B                      OK         44 degrees C / 111 degrees F
      CB 1 Intake                    OK         36 degrees C / 96 degrees F
      CB 1 Exhaust A                 OK         39 degrees C / 102 degrees F
      CB 1 Exhaust B                 OK         40 degrees C / 104 degrees F
      CB 1 ACBC                      OK         37 degrees C / 98 degrees F
      CB 1 XF A                      OK         50 degrees C / 122 degrees F
      CB 1 XF B                      OK         43 degrees C / 109 degrees F
      FPC 0 Intake                   OK         36 degrees C / 96 degrees F
      FPC 0 Exhaust A                OK         39 degrees C / 102 degrees F
      FPC 0 Exhaust B                OK         51 degrees C / 123 degrees F
```

```
      FPC 0 I3 0 TSensor              OK          49 degrees C / 120 degrees F
      FPC 0 I3 0 Chip                 OK          56 degrees C / 132 degrees F
      FPC 0 I3 1 TSensor              OK          47 degrees C / 116 degrees F
      FPC 0 I3 1 Chip                 OK          52 degrees C / 125 degrees F
      FPC 0 I3 2 TSensor              OK          46 degrees C / 114 degrees F
      FPC 0 I3 2 Chip                 OK          48 degrees C / 118 degrees F
      FPC 0 I3 3 TSensor              OK          42 degrees C / 107 degrees F
      FPC 0 I3 3 Chip                 OK          45 degrees C / 113 degrees F
      FPC 0 IA 0 TSensor              OK          45 degrees C / 113 degrees F
      FPC 0 IA 0 Chip                 OK          45 degrees C / 113 degrees F
      FPC 0 IA 1 TSensor              OK          44 degrees C / 111 degrees F
      FPC 0 IA 1 Chip                 OK          48 degrees C / 118 degrees F
      FPC 1 Intake                    OK          37 degrees C / 98 degrees F
      FPC 1 Exhaust A                 OK          41 degrees C / 105 degrees F
      FPC 1 Exhaust B                 OK          52 degrees C / 125 degrees F
      FPC 1 I3 0 TSensor              OK          51 degrees C / 123 degrees F
      FPC 1 I3 0 Chip                 OK          57 degrees C / 134 degrees F
      FPC 1 I3 1 TSensor              OK          48 degrees C / 118 degrees F
      FPC 1 I3 1 Chip                 OK          52 degrees C / 125 degrees F
      FPC 1 I3 2 TSensor              OK          46 degrees C / 114 degrees F
      FPC 1 I3 2 Chip                 OK          50 degrees C / 122 degrees F
      FPC 1 I3 3 TSensor              OK          42 degrees C / 107 degrees F
      FPC 1 I3 3 Chip                 OK          46 degrees C / 114 degrees F
      FPC 1 IA 0 TSensor              OK          49 degrees C / 120 degrees F
      FPC 1 IA 0 Chip                 OK          48 degrees C / 118 degrees F
      FPC 1 IA 1 TSensor              OK          46 degrees C / 114 degrees F
      FPC 1 IA 1 Chip                 OK          50 degrees C / 122 degrees F
Fans  Top Rear Fan                    OK          Spinning at normal speed
      Bottom Rear Fan                 OK          Spinning at normal speed
      Top Middle Fan                  OK          Spinning at normal speed
      Bottom Middle Fan               OK          Spinning at normal speed
      Top Front Fan                   OK          Spinning at normal speed
      Bottom Front Fan                OK          Spinning at normal speed
```

**show chassis environment (MX960 Router)**

```
user@host> show chassis environment
Class Item                            Status      Measurement
Temp  PEM 0                           Absent
      PEM 1                           Absent
      PEM 2                           Check
      PEM 3                           OK          35 degrees C / 95 degrees F
      Routing Engine 0                OK          37 degrees C / 98 degrees F
      Routing Engine 1                Absent
      CB 0 Intake                     OK          24 degrees C / 75 degrees F
      CB 0 Exhaust A                  OK          30 degrees C / 86 degrees F
      CB 0 Exhaust B                  OK          27 degrees C / 80 degrees F
      CB 1 Intake                     Absent
      CB 1 Exhaust A                  Absent
      CB 1 Exhaust B                  Absent
      CB 1 ACBC                       Absent
      CB 1 SF A                       Absent
      CB 1 SF B                       Absent
      CB 2 Intake                     Absent
      CB 2 Exhaust A                  Absent
      CB 2 Exhaust B                  Absent
      CB 2 ACBC                       Absent
      CB 2 SF A                       Absent
      CB 2 SF B                       Absent
      FPC 4 Intake                    OK          24 degrees C / 75 degrees F
      FPC 4 Exhaust A                 OK          36 degrees C / 96 degrees F
      FPC 4 Exhaust B                 OK          38 degrees C / 100 degrees F
      FPC 7 Intake                    OK          24 degrees C / 75 degrees F
```

```
      FPC 7 Exhaust A                OK         36 degrees C / 96 degrees F
      FPC 7 Exhaust B                OK         42 degrees C / 107 degrees F
Fans  Top Fan Tray Temp              Failed
      Top Tray Fan 1                 OK         Spinning at normal speed
      Top Tray Fan 2                 OK         Spinning at normal speed
      Top Tray Fan 3                 OK         Spinning at normal speed
      Top Tray Fan 4                 OK         Spinning at normal speed
      Top Tray Fan 5                 OK         Spinning at normal speed
      Top Tray Fan 6                 OK         Spinning at normal speed
      Bottom Fan Tray Temp           Failed
      Bottom Tray Fan 1              OK         Spinning at normal speed
      Bottom Tray Fan 2              OK         Spinning at normal speed
      Bottom Tray Fan 3              OK         Spinning at normal speed
      Bottom Tray Fan 4              OK         Spinning at normal speed
      Bottom Tray Fan 5              OK         Spinning at normal speed
      Bottom Tray Fan 6              OK         Spinning at normal speed
```

### show chassis environment (MX960 Router with Enhanced MX SCB)

```
user@host> show chassis environment
Class Item                           Status     Measurement
Temp  PEM 0                          Absent
      PEM 1                          OK         50 degrees C / 122 degrees F
      PEM 2                          OK         50 degrees C / 122 degrees F
      PEM 3                          OK         50 degrees C / 122 degrees F
      Routing Engine 0               OK         42 degrees C / 107 degrees F
      Routing Engine 0 CPU           OK         51 degrees C / 123 degrees F
      Routing Engine 1               OK         39 degrees C / 102 degrees F
      Routing Engine 1 CPU           OK         44 degrees C / 111 degrees F
      CB 0 Intake                    OK         35 degrees C / 95 degrees F
      CB 0 Exhaust A                 OK         36 degrees C / 96 degrees F
      CB 0 Exhaust B                 OK         43 degrees C / 109 degrees F
      CB 0 ACBC                      OK         38 degrees C / 100 degrees F
      CB 0 XF A                      OK         53 degrees C / 127 degrees F
      CB 0 XF B                      OK         47 degrees C / 116 degrees F
      CB 1 Intake                    OK         35 degrees C / 95 degrees F
      CB 1 Exhaust A                 OK         35 degrees C / 95 degrees F
      CB 1 Exhaust B                 OK         41 degrees C / 105 degrees F
      CB 1 ACBC                      OK         38 degrees C / 100 degrees F
      CB 1 XF A                      OK         52 degrees C / 125 degrees F
      CB 1 XF B                      OK         47 degrees C / 116 degrees F
      CB 2 Intake                    OK         32 degrees C / 89 degrees F
      CB 2 Exhaust A                 OK         30 degrees C / 86 degrees F
      CB 2 Exhaust B                 OK         35 degrees C / 95 degrees F
      CB 2 ACBC                      OK         33 degrees C / 91 degrees F
      CB 2 XF A                      OK         51 degrees C / 123 degrees F
      CB 2 XF B                      OK         50 degrees C / 122 degrees F
      FPC 0 Intake                   OK         35 degrees C / 95 degrees F
      FPC 0 Exhaust A                OK         39 degrees C / 102 degrees F
      FPC 0 Exhaust B                OK         50 degrees C / 122 degrees F
      FPC 0 I3 0 TSensor             OK         50 degrees C / 122 degrees F
      FPC 0 I3 0 Chip                OK         56 degrees C / 132 degrees F
      FPC 0 I3 1 TSensor             OK         47 degrees C / 116 degrees F
      FPC 0 I3 1 Chip                OK         50 degrees C / 122 degrees F
      FPC 0 I3 2 TSensor             OK         45 degrees C / 113 degrees F
      FPC 0 I3 2 Chip                OK         48 degrees C / 118 degrees F
      FPC 0 I3 3 TSensor             OK         41 degrees C / 105 degrees F
      FPC 0 I3 3 Chip                OK         44 degrees C / 111 degrees F
      FPC 0 IA 0 TSensor             OK         45 degrees C / 113 degrees F
      FPC 0 IA 0 Chip                OK         45 degrees C / 113 degrees F
      FPC 0 IA 1 TSensor             OK         44 degrees C / 111 degrees F
      FPC 0 IA 1 Chip                OK         48 degrees C / 118 degrees F
      FPC 1 Intake                   OK         36 degrees C / 96 degrees F
```

```
FPC 1 Exhaust A             OK         47 degrees C / 116 degrees F
FPC 1 Exhaust B             OK         43 degrees C / 109 degrees F
FPC 1 LU 0 TCAM TSen        OK         53 degrees C / 127 degrees F
FPC 1 LU 0 TCAM Chip        OK         57 degrees C / 134 degrees F
FPC 1 LU 0 TSen             OK         53 degrees C / 127 degrees F
FPC 1 LU 0 Chip             OK         60 degrees C / 140 degrees F
FPC 1 MQ 0 TSen             OK         53 degrees C / 127 degrees F
FPC 1 MQ 0 Chip             OK         56 degrees C / 132 degrees F
FPC 1 LU 1 TCAM TSen        OK         51 degrees C / 123 degrees F
FPC 1 LU 1 TCAM Chip        OK         52 degrees C / 125 degrees F
FPC 1 LU 1 TSen             OK         51 degrees C / 123 degrees F
FPC 1 LU 1 Chip             OK         53 degrees C / 127 degrees F
FPC 1 MQ 1 TSen             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 TSen             OK         53 degrees C / 127 degrees F
FPC 5 LU 0 Chip             OK         54 degrees C / 129 degrees F
FPC 5 LU 1 TSen             OK         53 degrees C / 127 degrees F
FPC 5 LU 1 Chip             OK         61 degrees C / 141 degrees F
FPC 5 LU 2 TSen             OK         53 degrees C / 127 degrees F
FPC 5 LU 2 Chip             OK         51 degrees C / 123 degrees F
FPC 5 LU 3 TSen             OK         53 degrees C / 127 degrees F
FPC 5 LU 3 Chip             OK         53 degrees C / 127 degrees F
FPC 5 MQ 0 TSen             OK         47 degrees C / 116 degrees F
FPC 5 MQ 0 Chip             OK         52 degrees C / 125 degrees F
FPC 5 MQ 1 TSen             OK         47 degrees C / 116 degrees F
FPC 5 MQ 1 Chip             OK         52 degrees C / 125 degrees F
FPC 5 MQ 2 TSen             OK         47 degrees C / 116 degrees F
FPC 5 MQ 2 Chip             OK         46 degrees C / 114 degrees F
FPC 5 MQ 3 TSen             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 TSen             OK         42 degrees C / 107 degrees F
```

```
        FPC 7 QX 0 Chip              OK         47 degrees C / 116 degrees F
        FPC 7 LU 0 TCAM TSen         OK         42 degrees C / 107 degrees F
        FPC 7 LU 0 TCAM Chip         OK         44 degrees C / 111 degrees F
        FPC 7 LU 0 TSen              OK         42 degrees C / 107 degrees F
        FPC 7 LU 0 Chip              OK         46 degrees C / 114 degrees F
        FPC 7 MQ 0 TSen              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 (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 (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@host> 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 (QFX Series)**

```
user@switch> show chassis environment
Class Item                           Status     Measurement
Power FPC 0 Power Supply 0           OK
      FPC 0 Power Supply 1           OK
Temp  FPC 0 Sensor TopLeft I         OK         26 degrees C / 78 degrees F
      FPC 0 Sensor TopRight I        OK         24 degrees C / 75 degrees F
      FPC 0 Sensor TopLeft E         OK         30 degrees C / 86 degrees F
      FPC 0 Sensor TopRight E        OK         30 degrees C / 86 degrees F
      FPC 0 Sensor TopMiddle I       OK         30 degrees C / 86 degrees F
      FPC 0 Sensor TopMiddle E       OK         38 degrees C / 100 degrees F
      FPC 0 Sensor Bottom I          OK         34 degrees C / 93 degrees F
      FPC 0 Sensor Bottom E          OK         38 degrees C / 100 degrees F
      FPC 0 Sensor Die Temp          OK         38 degrees C / 100 degrees F
      FPC 0 Sensor Mgmnt Brd I       OK         24 degrees C / 75 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 node-device (QFabric Switch)**

```
user@switch> show chassis environment node-device node1
Class Item                           Status     Measurement
Power node1 Power Supply 0            Absent
      node1 Power Supply 1            Absent
Fans  node1 Fan Tray 0                Testing
      node1 Fan Tray 1                Testing
      node1 Fan Tray 2                Testing
```

## show chassis environment 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

**List of Sample Output**

show chassis environment pcg (M40e Router) on page 308
show chassis environment pcg (M160 Router) on page 308

**Output Fields**

Table 29 on page 307 lists the output fields for the **show chassis environment pcg** command. Output fields are listed in the approximate order in which they appear.

### Table 29: show chassis environment pcg Output Fields

| Field Name | Field Description |
|---|---|
| **PCG slot status** | Slot number: **0** or **1**. |
| **State** | Status of PCG:<br>• **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.<br>• **Online**—PCG is powered down. If **Online**, it can be the **Master clock** or the **Standby clock**.<br>• **Offline**—PCG is powered down.<br>• **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 (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*>

**Release Information**

Command introduced before Junos OS Release 7.4.

**Description**

(M40e, M120, M160, M320, MX Series, and T Series routers only) 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.

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.

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

**List of Sample Output**

show chassis environment pem (M40e Router) on page 311
show chassis environment pem (M120 Router) on page 311
show chassis environment pem (M160 Router) on page 311
show chassis environment pem (M320 Router) on page 312
show chassis environment pem (MX240 Router) on page 312
show chassis environment pem (MX480 Router) on page 312
show chassis environment pem (MX960 Router) on page 312
show chassis environment pem (T320 Router) on page 312
show chassis environment pem (T640 Router) on page 313
show chassis environment pem lcc (TX Matrix Routing Matrix) on page 313
show chassis environment pem scc (TX Matrix Routing Matrix) on page 313
show chassis environment pem sfc (TX Matrix Plus Routing Matrix) on page 313
show chassis environment pem lcc (TX Matrix Plus Routing Matrix) on page 314

**Output Fields** Table 30 on page 310 lists the output fields for the **show chassis environment pem** command. Output fields are listed in the approximate order in which they appear.

### Table 30: 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. |

### Table 30: show chassis environment pem Output Fields *(continued)*

| Field Name | Field Description |
|---|---|
| **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. |

## 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 lcc (TX Matrix Routing Matrix)**

```
user@host> show chassis environment pem 0 lcc 0
lcc0-re0:
--------------------------------------------------------------------------
PEM 0 status:
  State                          Present
  Temperature                 27 degrees C / 80 degrees F
  DC input:                      Check
  DC output:           Voltage   Current       Power    Load
       FPC 0                 0         0           0       0
       FPC 1                 0         0           0       0
       FPC 2                 0         0           0       0
       FPC 3                 0         0           0       0
       FPC 4                 0         0           0       0
       FPC 5                 0         0           0       0
       FPC 6                 0         0           0       0
       FPC 7                 0         0           0       0
  SCG/CB/SIB                 0         0           0       0
```

**show chassis environment pem scc (TX Matrix Routing Matrix)**

```
user@host> show chassis environment pem scc
scc-re0:
--------------------------------------------------------------------------
PEM 1 status:
  State                          Online
  Temperature                 24 degrees C / 75 degrees F
  DC input:                      OK
  DC output:           Voltage   Current       Power    Load
       SIB 0                 0         0           0       0
       SIB 1                 0         0           0       0
       SIB 2                 0         0           0       0
       SIB 3             56550         0           0       0
       SIB 4             55958      6912         386      51
```

**show chassis environment pem sfc (TX Matrix Plus Routing Matrix)**

```
user@host> show chassis environment pem sfc 0
sfc0-re0:
--------------------------------------------------------------------------
PEM 0 status:
  State                     Online
  Temperature               35 degrees C / 95 degrees F
  DC Input:                  OK
  DC Output            Voltage   Current       Power    Load
      Channel 0          53820     14140         761      59
```

```
      Channel 1           53550     12720         681       53
      Channel 2           53840     12930         696       54
      Channel 3           53690     14990         804       63
      Channel 4           53620     15070         808       63
      Channel 5           53900     14820         798       62
      Channel 6           54120     5020          271       21
```

**show chassis environment pem lcc (TX Matrix Plus Routing Matrix)**

user@host> **show chassis environment lcc 0**

```
lcc0-re1:
--------------------------------------------------------------------------
PEM 0 status:
  State                       Online
  Temperature                 38 degrees C / 100 degrees F
  DC Input:                   OK
  DC Output              Voltage   Current       Power    Load
      FPC 0               0         0             0        0
      FPC 1               0         0             0        0
      FPC 2               0         0             0        0
      FPC 3               0         0             0        0
      FPC 4               56408     7575          427      56
      FPC 5               0         0             0        0
      FPC 6               56266     7956          447      59
      FPC 7               56283     6100          343      45
      SCG/CB/SIB          55916     8950          500      41
PEM 1 status:
  State                       Present
  Temperature                 35 degrees C / 95 degrees F
  DC Input:                   Check
  DC Output              Voltage   Current       Power    Load
      FPC 0               0         0             0        0
      FPC 1               0         0             0        0
      FPC 2               0         0             0        0
      FPC 3               0         0             0        0
      FPC 4               0         0             0        0
      FPC 5               0         0             0        0
      FPC 6               0         0             0        0
      FPC 7               0         0             0        0
      SCG/CB/SIB          0         0             0        0
```

## show chassis environment 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 (MX Series Routers)**

show chassis environment routing-engine
<*slot*>
<all-members>
<local>
<member *member-id*>

**Syntax (QFX Series)**

show chassis environment routing-engine
interconnect-device *name*

**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 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 switches 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, 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.

**Required Privilege Level** view

**List of Sample Output**

show chassis environment routing-engine (Nonredundant) on page 316
show chassis environment routing-engine (Redundant) on page 317
show chassis environment routing-engine (TX Matrix Plus Router) on page 317
show chassis environment routing-engine (QFX Series) on page 317
show chassis environment routing-engine interconnect-device (QFabric Switch) on page 317

**Output Fields** Table 31 on page 316 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 31: 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:<br>• **Online Master**—MCS is online, operating as Master.<br>• **Online Standby**—MCS is online, operating as Standby. |
| **Temperature** | Temperature of the air flowing past the Routing Engine. |

## 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 (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 (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 Switch)**

```
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 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.

**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

**List of Sample Output**

show chassis environment scg (T Series Routers) on page 319
show chassis environment scg lcc (TX Matrix Router) on page 319
show chassis environment scg lcc (TX Matrix Plus Router) on page 320
show chassis environment scg (TX Matrix Plus Router) on page 320

**Output Fields**

Table 32 on page 318 lists the output fields for the **show chassis environment scg** command. Output fields are listed in the approximate order in which they appear.

### Table 32: show chassis environment scg Output Fields

| Field Name | Field Description |
| --- | --- |
| **SCG *slot* status** | Number of the SCG slot: **0** or **1**. |

### Table 32: show chassis environment scg Output Fields *(continued)*

| Field Name | Field Description |
|---|---|
| **State** | Status of the SCG:<br>• **Online**—SCG is online and running.<br>• **Offline**—SCG is powered down.<br>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 lcc (TX Matrix Router)

```
user@host> show chassis environment scg lcc 0 0
lcc0-re0:
--------------------------------------------------------------------------
SCG 0 status:
  State                            Online -  Master clock
  Temperature                   30 degrees C / 86 degrees F
  Power:
    GROUND                         0 mV
    3.3 V                       3321 mV
```

```
    5.0 V                    5062 mV
    5.6 V                    5682 mV
    1.8 V bias               1789 mV
    3.3 V bias               3289 mV
    5.0 V bias               4993 mV
    8.0 V bias               7807 mV
  BUS Revision                 40
```

**show chassis environment scg lcc (TX Matrix Plus Router)**

```
user@host> show chassis environment scg lcc 0
lcc0-re0:
--------------------------------------------------------------------------
SCG 0 status:
  State                       Online -  Master clock
  Temperature                 42 degrees C / 107 degrees F
  Power
    GROUND                        0 mV
    1.8 V bias                 1800 mV
    3.3 V                      3290 mV
    3.3 V bias                 3304 mV
    5.0 V                      5042 mV
    5.0 V bias                 4979 mV
    5.6 V                      5765 mV
    8.0 V bias                 7682 mV
  Bus Revision                40
```

**show chassis environment scg (TX Matrix Plus Router)**

```
user@host> show chassis environment scg
lcc0-re0:
--------------------------------------------------------------------------
SCG 0 status:
  State                       Online -  Master clock
  Temperature                 40 degrees C / 104 degrees F
  Power
    GROUND                        0 mV
    1.8 V bias                 1800 mV
    3.3 V                      3291 mV
    3.3 V bias                 3304 mV
    5.0 V                      5042 mV
    5.0 V bias                 4979 mV
    5.6 V                      5765 mV
    8.0 V bias                 7643 mV
  Bus Revision                40

lcc1-re0:
--------------------------------------------------------------------------
SCG 0 status:
  State                       Online -  Master clock
  Temperature                 37 degrees C / 98 degrees F
  Power
    GROUND                        0 mV
    1.8 V bias                 1788 mV
    3.3 V                      3305 mV
    3.3 V bias                 3284 mV
    5.0 V                      5042 mV
    5.0 V bias                 5010 mV
    5.6 V                      5748 mV
    8.0 V bias                 7692 mV
  Bus Revision                40

lcc2-re0:
--------------------------------------------------------------------------
SCG 0 status:
```

```
  State                    Online -  Master clock
  Temperature              39 degrees C / 102 degrees F
  Power
    GROUND                    0 mV
    1.8 V bias             1785 mV
    3.3 V                  3306 mV
    3.3 V bias             3301 mV
    5.0 V                  5045 mV
    5.0 V bias             4993 mV
    5.6 V                  5765 mV
    8.0 V bias             7838 mV
  Bus Revision             40

lcc3-re0:
--------------------------------------------------------------------------
SCG 0 status:
  State                    Online -  Master clock
  Temperature              39 degrees C / 102 degrees F
  Power
    GROUND                    0 mV
    1.8 V bias             1800 mV
    3.3 V                  3290 mV
    3.3 V bias             3294 mV
    5.0 V                  5050 mV
    5.0 V bias             4984 mV
    5.6 V                  5780 mV
    8.0 V bias             7716 mV
  Bus Revision             40
```

## show chassis environment 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

**List of Sample Output**

show chassis environment sfm (M40e Router) on page 323
show chassis environment sfm (M160 Router) on page 323

**Output Fields**

Table 33 on page 322 lists the output fields for the **show chassis environment sfm** command. Output fields are listed in the approximate order in which they appear.

### Table 33: 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:<br>• **Online**—SFM is online and running.<br>• **Offline**—SFM is powered down.<br>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. |
| **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 for the TX Matrix Plus router in Junos OS Release 9.6.

**Description**

(M320, T Series routers, TX Matrix and TX Matrix Plus only) Display Switch Interface Boards (SIB) environmental information.

**Options**

none—(TX Matrix and TX Matrix Plus routers only) 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**.

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, and TX Matrix routers, replace ***slot*** with a value from **0** through **4**. For the TX Matrix Plus router, replace ***slot*** with a value from **0** through **15**. For the T320 router, replace ***slot*** with a value from **0** through **2**.

**Required Privilege Level** view

**List of Sample Output**

show chassis environment sib (M320 Router) on page 326
show chassis environment sib 1 (T640 Router) on page 327
show chassis environment sib scc (TX Matrix Router) on page 328
show chassis environment sib (TX Matrix Plus Router) on page 328
show chassis environment sib sfc (TX Matrix Plus Router) on page 338
show chassis environment sib f13 (TX Matrix Plus Router) on page 343
show chassis environment sib f2s (TX Matrix Plus Router) on page 344

**Output Fields** Table 34 on page 326 lists the output fields for the **show chassis environment sib** command. Output fields are listed in the approximate order in which they appear.

### Table 34: show chassis environment sib Output Fields

| Field Name | Field Description |
|---|---|
| **SIB slot status** | SIB slot number:<br>• **0** through **3** on an M320 router.<br>• **0** or **2** on a T320 router.<br>• **0** through **4** on a T640 or T1600 router.<br>• **0** through **15** on a TX Matrix or TX Matrix Plus router.<br>• **0**, **1**, **3**, **4**, **6**, **7**, **8**, **9**, **11**, or **12** for F13 SIBs on a TX Matrix Plus router.<br>• **0** through **4**, followed by **0**, **2**, **4**, or **6** for an F2S SIB on a TX Matrix Plus router. For example, **SIB F2S 0/4**. |
| **State** | Status of the SIB:<br>• **Online**—SIB is online and running.<br>• **Offline**—SIB is powered down.<br>• **Spare** (T640 router only)—SIB is redundant and will move to active state if one of the working SIBs fails.<br>Only four of the five T640 router 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. |
| **Temperature** | Temperature of the air flowing past the SIB. |
| **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 scc (TX Matrix Router)**

```
user@host> show chassis environment sib scc
scc-re0:
--------------------------------------------------------------------------
SIB 3 status:
  State                           Offline
  Reason                          Offlined by button press
  Temperature                   0 degrees C / 32 degrees F
  Power:
    GROUND                      0 mV
    1.8 V                       0 mV
    2.5 V                       0 mV
    3.3 V                       0 mV
    1.8 V bias                  0 mV
    3.3 V bias                  0 mV
    5.0 V bias                  0 mV
    8.0 V bias                  0 mV
SIB 4 status:
  State                           Online
  Temperature                  42 degrees C / 107 degrees F
  Temperature (B)              41 degrees C / 105 degrees F
  Power:
    GROUND                      0 mV
    1.8 V                    1787 mV
    2.5 V                    2488 mV
    3.3 V                    3294 mV
    1.8 V bias               1787 mV
    3.3 V bias               3306 mV
    5.0 V bias               5010 mV
    8.0 V bias               7418 mV
  Power (B):
    GROUND                      0 mV
    1.8 V                    1785 mV
    2.5 V                    2485 mV
    3.3 V                    3289 mV
    1.8 V bias               1799 mV
    3.3 V bias               3284 mV
    5.0 V bias               4979 mV
    8.0 V bias               7882 mV
```

**show chassis environment sib (TX Matrix Plus Router)**

```
user@host> show chassis environment sib
sfc0-re0:
--------------------------------------------------------------------------
SIB F13 0 status:
  State                      Online - Standby
  Temperature                54 degrees C / 129 degrees F
  Temperature (B)            50 degrees C / 122 degrees F
  Power
    1.2 V_0                   1205 mV
    1.2 V_1                   1202 mV
    1.2 V_2                   1205 mV
    1.2 V_3                   1208 mV
    1.5 V_0                   1501 mV
    1.5 V_1                   1508 mV
    1.8 V                     1798 mV
    2.5 V                     2510 mV
    3.3 V                     3312 mV
    9.0 V                     8991 mV
    9.0 V bias                   0 mV
  Power (B)
    2.5 V                     2510 mV
    3.3 V                     3318 mV
```

```
    9.0 V                     9024 mV
SIB F13 1 status:
  State                      Online - Standby
  Temperature                45 degrees C / 113 degrees F
  Temperature (B)            42 degrees C / 107 degrees F
  Power
    1.2 V_0                   1202 mV
    1.2 V_1                   1198 mV
    1.2 V_2                   1202 mV
    1.2 V_3                   1202 mV
    1.5 V_0                   1498 mV
    1.5 V_1                   1501 mV
    1.8 V                     1811 mV
    2.5 V                     2504 mV
    3.3 V                     3292 mV
    9.0 V                     8991 mV
    9.0 V bias                   0 mV
  Power (B)
    2.5 V                     2507 mV
    3.3 V                     3306 mV
    9.0 V                     8970 mV
SIB F13 3 status:
  State                      Online
  Temperature                48 degrees C / 118 degrees F
  Temperature (B)            44 degrees C / 111 degrees F
  Power
    1.2 V_0                   1205 mV
    1.2 V_1                   1202 mV
    1.2 V_2                   1202 mV
    1.2 V_3                   1202 mV
    1.5 V_0                   1508 mV
    1.5 V_1                   1504 mV
    1.8 V                     1798 mV
    2.5 V                     2520 mV
    3.3 V                     3300 mV
    9.0 V                     9009 mV
    9.0 V bias                   0 mV
  Power (B)
    2.5 V                     2504 mV
    3.3 V                     3312 mV
    9.0 V                     9006 mV
SIB F13 4 status:
  State                      Online
  Temperature                44 degrees C / 111 degrees F
  Temperature (B)            40 degrees C / 104 degrees F
Power
    1.2 V_0                   1205 mV
    1.2 V_1                   1205 mV
    1.2 V_2                   1202 mV
    1.2 V_3                   1205 mV
    1.5 V_0                   1508 mV
    1.5 V_1                   1508 mV
    1.8 V                     1811 mV
    2.5 V                     2510 mV
    3.3 V                     3312 mV
    9.0 V                     8970 mV
    9.0 V bias                   0 mV
  Power (B)
    2.5 V                     2513 mV
    3.3 V                     3318 mV
    9.0 V                     9048 mV
```

```
SIB F13 6 status:
  State                         Online
  Temperature                   50 degrees C / 122 degrees F
  Temperature (B)               46 degrees C / 114 degrees F
  Power
    1.2 V_0                      1195 mV
    1.2 V_1                      1205 mV
    1.2 V_2                      1202 mV
    1.2 V_3                      1202 mV
    1.5 V_0                      1495 mV
    1.5 V_1                      1495 mV
    1.8 V                        1801 mV
    2.5 V                        2494 mV
    3.3 V                        3300 mV
    9.0 V                        8991 mV
    9.0 V bias                      0 mV
  Power (B)
    2.5 V                        2500 mV
    3.3 V                        3300 mV
    9.0 V                        9006 mV
SIB F13 7 status:
  State                         Online
  Temperature                   52 degrees C / 125 degrees F
  Temperature (B)               49 degrees C / 120 degrees F
  Power
    1.2 V_0                      1202 mV
    1.2 V_1                      1202 mV
    1.2 V_2                      1198 mV
    1.2 V_3                      1185 mV
    1.5 V_0                      1501 mV
    1.5 V_1                      1492 mV
    1.8 V                        1795 mV
    2.5 V                        2491 mV
    3.3 V                        3286 mV
    9.0 V                        8892 mV
    9.0 V bias                      0 mV
  Power (B)
    2.5 V                        2507 mV
    3.3 V                        3306 mV
    9.0 V                        8952 mV
SIB F13 8 status:
  State                         Online
  Temperature                   55 degrees C / 131 degrees F
  Temperature (B)               50 degrees C / 122 degrees F
  Power
    1.2 V_0                      1208 mV
    1.2 V_1                      1205 mV
    1.2 V_2                      1205 mV
    1.2 V_3                      1211 mV
    1.5 V_0                      1514 mV
    1.5 V_1                      1508 mV
    1.8 V                        1807 mV
    2.5 V                        2516 mV
    3.3 V                        3324 mV
    9.0 V                        9027 mV
    9.0 V bias                      0 mV
  Power (B)
    2.5 V                        2520 mV
    3.3 V                        3318 mV
    9.0 V                        9066 mV
SIB F13 9 status:
```

```
    State                     Online
    Temperature               46 degrees C / 114 degrees F
    Temperature (B)           41 degrees C / 105 degrees F
    Power
      1.2 V_0                  1208 mV
      1.2 V_1                  1202 mV
      1.2 V_2                  1208 mV
      1.2 V_3                  1202 mV
      1.5 V_0                  1504 mV
      1.5 V_1                  1504 mV
      1.8 V                    1817 mV
      2.5 V                    2516 mV
      3.3 V                    3312 mV
      9.0 V                    9009 mV
      9.0 V bias                  0 mV
    Power (B)
      2.5 V                    2510 mV
      3.3 V                    3312 mV
      9.0 V                    9024 mV
  SIB F13 11 status:
    State                     Online
    Temperature               47 degrees C / 116 degrees F
    Temperature (B)           42 degrees C / 107 degrees F
    Power
      1.2 V_0                  1202 mV
      1.2 V_1                  1205 mV
      1.2 V_2                  1202 mV
      1.2 V_3                  1202 mV
      1.5 V_0                  1501 mV
      1.5 V_1                  1501 mV
      1.8 V                    1801 mV
      2.5 V                    2510 mV
      3.3 V                    3312 mV
      9.0 V                    8979 mV
      9.0 V bias                  0 mV
    Power (B)
      2.5 V                    2252 mV
      3.3 V                    5014 mV
      9.0 V                    9954 mV
  SIB F13 12 status:
    State                     Online
    Temperature               45 degrees C / 113 degrees F
    Temperature (B)           40 degrees C / 104 degrees F
    Power
      1.2 V_0                  1211 mV
      1.2 V_1                  1208 mV
      1.2 V_2                  1205 mV
      1.2 V_3                  1205 mV
      1.5 V_0                  1511 mV
      1.5 V_1                  1501 mV
      1.8 V                    1817 mV
      2.5 V                    2504 mV
      3.3 V                    3318 mV
      9.0 V                    9027 mV
      9.0 V bias                  0 mV
   Power (B)
      2.5 V                    2520 mV
      3.3 V                    3338 mV
      9.0 V                    9006 mV
  SIB F2S 0/0 status:
    State                     Online - Standby
```

```
  Temperature                 40 degrees C / 104 degrees F
  Power
    1.2 V_1                      0 mV
    1.2 V_ASF                 1198 mV
    1.2 V_ASF_B               1198 mV
    1.2 V_ASF_D               1202 mV
    1.5 V                     1498 mV
    1.8 V                     1814 mV
    3.3 V                     3300 mV
    3.3 V bias                3300 mV
    3.3 V ASF                 3286 mV
    9.0 V                     8250 mV
SIB F2S 0/2 status:
  State                       Online - Standby
  Temperature                 40 degrees C / 104 degrees F
  Power
    1.2 V_1                      0 mV
    1.2 V_ASF                 1198 mV
    1.2 V_ASF_B               1195 mV
    1.2 V_ASF_D               1202 mV
    1.5 V                     1498 mV
    1.8 V                     1807 mV
    3.3 V                     3300 mV
    3.3 V bias                3300 mV
    3.3 V ASF                 3286 mV
    9.0 V                     8250 mV
SIB F2S 0/4 status:
  State                       Online - Standby
  Temperature                 40 degrees C / 104 degrees F
  Power
    1.2 V_1                      0 mV
    1.2 V_ASF                 1202 mV
    1.2 V_ASF_B               1198 mV
    1.2 V_ASF_D               1202 mV
    1.5 V                     1504 mV
    1.8 V                     1817 mV
    3.3 V                     3300 mV
    3.3 V bias                3300 mV
    3.3 V ASF                 3306 mV
    9.0 V                     8250 mV
SIB F2S 0/6 status:
  State                       Online - Standby
  Temperature                 39 degrees C / 102 degrees F
  Power
    1.2 V_1                      0 mV
    1.2 V_ASF                 1202 mV
    1.2 V_ASF_B               1198 mV
    1.2 V_ASF_D               1202 mV
    1.5 V                     1495 mV
    1.8 V                     1814 mV
    3.3 V                     3300 mV
    3.3 V bias                3300 mV
    3.3 V ASF                 3280 mV
    9.0 V                     8250 mV
SIB F2S 1/0 status:
  State                       Online
  Temperature                 39 degrees C / 102 degrees F
  Power
    1.2 V_1                      0 mV
    1.2 V_ASF                 1195 mV
    1.2 V_ASF_B               1192 mV
```

```
    1.2 V_ASF_D              1195 mV
    1.5 V                    1488 mV
    1.8 V                    1798 mV
    3.3 V                    3300 mV
    3.3 V bias               3300 mV
    3.3 V ASF                3280 mV
    9.0 V                    8250 mV
SIB F2S 1/2 status:
  State                     Online
  Temperature               39 degrees C / 102 degrees F
  Power
    1.2 V_1                     0 mV
    1.2 V_ASF                1205 mV
    1.2 V_ASF_B              1202 mV
    1.2 V_ASF_D              1205 mV
    1.5 V                    1501 mV
    1.8 V                    1820 mV
    3.3 V                    3300 mV
    3.3 V bias               3300 mV
    3.3 V ASF                3306 mV
    9.0 V                    8250 mV
SIB F2S 1/4 status:
  State                     Online
  Temperature               39 degrees C / 102 degrees F
  Power
    1.2 V_1                     0 mV
    1.2 V_ASF                1198 mV
    1.2 V_ASF_B              1195 mV
    1.2 V_ASF_D              1195 mV
    1.5 V                    1498 mV
    1.8 V                    1811 mV
    3.3 V                    3300 mV
    3.3 V bias               3300 mV
    3.3 V ASF                3300 mV
    9.0 V                    8250 mV
SIB F2S 1/6 status:
  State                     Online
  Temperature               39 degrees C / 102 degrees F
  Power
    1.2 V_1                     0 mV
    1.2 V_ASF                1195 mV
    1.2 V_ASF_B              1195 mV
    1.2 V_ASF_D              1198 mV
    1.5 V                    1498 mV
    1.8 V                    1807 mV
    3.3 V                    3306 mV
    3.3 V bias               3300 mV
    3.3 V ASF                3292 mV
    9.0 V                    8250 mV
SIB F2S 2/0 status:
  State                     Online
  Temperature               39 degrees C / 102 degrees F
  Power
    1.2 V_1                     0 mV
    1.2 V_ASF                1195 mV
    1.2 V_ASF_B              1195 mV
    1.2 V_ASF_D              1198 mV
    1.5 V                    1498 mV
    1.8 V                    1804 mV
    3.3 V                    3300 mV
    3.3 V bias               3300 mV
```

```
    3.3 V ASF                3286 mV
    9.0 V                    8250 mV
SIB F2S 2/2 status:
  State                     Online
Temperature               38 degrees C / 100 degrees F
  Power
    1.2 V_1                     0 mV
    1.2 V_ASF                1195 mV
    1.2 V_ASF_B              1195 mV
    1.2 V_ASF_D              1198 mV
    1.5 V                    1495 mV
    1.8 V                    1807 mV
    3.3 V                    3300 mV
    3.3 V bias               3300 mV
    3.3 V ASF                3300 mV
    9.0 V                    8250 mV
SIB F2S 2/4 status:
  State                     Online
  Temperature               38 degrees C / 100 degrees F
  Power
    1.2 V_1                     0 mV
    1.2 V_ASF                1198 mV
    1.2 V_ASF_B              1195 mV
    1.2 V_ASF_D              1198 mV
    1.5 V                    1501 mV
    1.8 V                    1804 mV
    3.3 V                    3286 mV
    3.3 V bias               3292 mV
    3.3 V ASF                3300 mV
    9.0 V                    8230 mV
SIB F2S 2/6 status:
  State                     Online
  Temperature               38 degrees C / 100 degrees F
  Power
    1.2 V_1                     0 mV
    1.2 V_ASF                1202 mV
    1.2 V_ASF_B              1198 mV
    1.2 V_ASF_D              1202 mV
    1.5 V                    1501 mV
    1.8 V                    1817 mV
    3.3 V                    3300 mV
    3.3 V bias               3300 mV
    3.3 V ASF                3318 mV
    9.0 V                    8250 mV
SIB F2S 3/0 status:
  State                     Online
  Temperature               38 degrees C / 100 degrees F
  Power
    1.2 V_1                     0 mV
    1.2 V_ASF                1195 mV
    1.2 V_ASF_B              1195 mV
    1.2 V_ASF_D              1198 mV
    1.5 V                    1501 mV
    1.8 V                    1814 mV
    3.3 V                    3300 mV
    3.3 V bias               3300 mV
    3.3 V ASF                3274 mV
    9.0 V                    8250 mV
SIB F2S 3/2 status:
  State                     Online
  Temperature               37 degrees C / 98 degrees F
```

```
  Power
    1.2 V_1                    0 mV
    1.2 V_ASF               1202 mV
    1.2 V_ASF_B             1195 mV
    1.2 V_ASF_D             1195 mV
    1.5 V                   1495 mV
    1.8 V                   1804 mV
    3.3 V                   3300 mV
    3.3 V bias              3300 mV
    3.3 V ASF               3286 mV
    9.0 V                   8250 mV
SIB F2S 3/4 status:
  State                    Online
  Temperature              37 degrees C / 98 degrees F
  Power
    1.2 V_1                    0 mV
    1.2 V_ASF               1205 mV
    1.2 V_ASF_B             1198 mV
    1.2 V_ASF_D             1202 mV
    1.5 V                   1501 mV
    1.8 V                   1811 mV
    3.3 V                   3300 mV
    3.3 V bias              3300 mV
    3.3 V ASF               3318 mV
    9.0 V                   8250 mV
SIB F2S 3/6 status:
  State                    Online
  Temperature              37 degrees C / 98 degrees F
  Power
    1.2 V_1                    0 mV
    1.2 V_ASF               1205 mV
    1.2 V_ASF_B             1202 mV
    1.2 V_ASF_D             1202 mV
    1.5 V                   1511 mV
    1.8 V                   1820 mV
    3.3 V                   3306 mV
    3.3 V bias              3306 mV
    3.3 V ASF               3318 mV
    9.0 V                   8265 mV
SIB F2S 4/0 status:
  State                    Online
  Temperature              36 degrees C / 96 degrees F
  Power
    1.2 V_1                    0 mV
    1.2 V_ASF               1198 mV
    1.2 V_ASF_B             1198 mV
    1.2 V_ASF_D             1198 mV
    1.5 V                   1501 mV
    1.8 V                   1814 mV
    3.3 V                   3292 mV
    3.3 V bias              3292 mV
    3.3 V ASF               3312 mV
    9.0 V                   8230 mV
SIB F2S 4/2 status:
  State                    Online
  Temperature              37 degrees C / 98 degrees F
  Power
    1.2 V_1                    0 mV
    1.2 V_ASF               1198 mV
    1.2 V_ASF_B             1192 mV
    1.2 V_ASF_D             1195 mV
```

```
    1.5 V                      1495 mV
    1.8 V                      1807 mV
    3.3 V                      3300 mV
    3.3 V bias                 3300 mV
    3.3 V ASF                  3300 mV
    9.0 V                      8250 mV
SIB F2S 4/4 status:
  State                       Online
  Temperature                 36 degrees C / 96 degrees F
  Power
    1.2 V_1                       0 mV
    1.2 V_ASF                  1202 mV
    1.2 V_ASF_B                1195 mV
    1.2 V_ASF_D                1202 mV
   1.5 V                      1501 mV
    1.8 V                      1814 mV
    3.3 V                      3300 mV
    3.3 V bias                 3300 mV
    3.3 V ASF                  3312 mV
    9.0 V                      8250 mV
SIB F2S 4/6 status:
  State                       Online
  Temperature                 36 degrees C / 96 degrees F
  Power
    1.2 V_1                       0 mV
    1.2 V_ASF                  1198 mV
    1.2 V_ASF_B                1195 mV
    1.2 V_ASF_D                1198 mV
    1.5 V                      1498 mV
    1.8 V                      1820 mV
    3.3 V                      3292 mV
    3.3 V bias                 3292 mV
    3.3 V ASF                  3286 mV
    9.0 V                      8230 mV

lcc0-re0:
--------------------------------------------------------------------------
SIB 0 status:
  State                       Online - Standby
  Temperature                 49 degrees C / 120 degrees F
  Temperature (B)             42 degrees C / 107 degrees F
  Power
    1.2 V                      1204 mV
    1.5 V                      1484 mV
    2.5 V                      2500 mV
    3.3 V                      3312 mV
    3.3 V bias                 3312 mV
    5.0 V bias                 4956 mV
    8.0 V bias                 7740 mV
    9.0 V                      8880 mV
  Power (B)
    1.2 V                      1206 mV
    2.5 V                      2500 mV
    3.3 V                      3316 mV
    9.0 V                      8988 mV
SIB 1 status:
  State                       Online
  Temperature                 49 degrees C / 120 degrees F
  Temperature (B)             42 degrees C / 107 degrees F
  Power
    1.2 V                      1202 mV
```

```
      1.5 V                     1482 mV
      2.5 V                     2500 mV
      3.3 V                     3296 mV
      3.3 V bias                3288 mV
      5.0 V bias                4986 mV
      8.0 V bias                7800 mV
      9.0 V                     8868 mV
    Power (B)
      1.2 V                     1206 mV
      2.5 V                     2512 mV
      3.3 V                     3312 mV
      9.0 V                     8952 mV
  SIB 2 status:
    State                      Online
    Temperature                49 degrees C / 120 degrees F
    Temperature (B)            42 degrees C / 107 degrees F
    Power
      1.2 V                     1202 mV
    1.5 V                     1480 mV
      2.5 V                     2476 mV
      3.3 V                     3292 mV
      3.3 V bias                3308 mV
      5.0 V bias                5010 mV
      8.0 V bias                7800 mV
      9.0 V                     8880 mV
    Power (B)
      1.2 V                     1204 mV
      2.5 V                     2516 mV
      3.3 V                     3308 mV
      9.0 V                     8988 mV
  SIB 3 status:
    State                      Online
    Temperature                48 degrees C / 118 degrees F
    Temperature (B)            42 degrees C / 107 degrees F
    Power
      1.2 V                     1204 mV
      1.5 V                     1480 mV
      2.5 V                     2500 mV
      3.3 V                     3292 mV
      3.3 V bias                3292 mV
      5.0 V bias                4986 mV
      8.0 V bias                7812 mV
      9.0 V                     8892 mV
    Power (B)
      1.2 V                     1198 mV
      2.5 V                     2512 mV
      3.3 V                     3308 mV
      9.0 V                     8892 mV
  SIB 4 status:
    State                      Online
    Temperature                48 degrees C / 118 degrees F
    Temperature (B)            42 degrees C / 107 degrees F
    Power
      1.2 V                     1206 mV
      1.5 V                     1482 mV
      2.5 V                     2484 mV
      3.3 V                     3324 mV
      3.3 V bias                3340 mV
      5.0 V bias                4980 mV
      8.0 V bias                7764 mV
      9.0 V                     8784 mV
```

```
  Power (B)
    1.2 V                      1202 mV
    2.5 V                      2504 mV
    3.3 V                      3308 mV
    9.0 V                      8820 mV
lcc1-re0:
--------------------------------------------------------------------------
SIB 0 status:
  State                       Online - Standby
  Temperature                 49 degrees C / 120 degrees F
  Temperature (B)             43 degrees C / 109 degrees F
  Power
    1.2 V                      1206 mV
    1.5 V                      1506 mV
    2.5 V                      2496 mV
    3.3 V                      3308 mV
    3.3 V bias                 3296 mV
    5.0 V bias                 4974 mV
    8.0 V bias                 7884 mV
    9.0 V                      8820 mV
  Power (B)
    1.2 V                      1200 mV
    2.5 V                      2508 mV
    3.3 V                      3292 mV
    9.0 V                      8892 mV
...
```

### show chassis environment sib sfc (TX Matrix Plus Router)

```
user@host> show chassis environment sib sfc
sfc0-re0:
--------------------------------------------------------------------------
SIB F13 0 status:
  State                       Online - Standby
  Temperature                 54 degrees C / 129 degrees F
  Temperature (B)             50 degrees C / 122 degrees F
  Power
    1.2 V_0                    1205 mV
    1.2 V_1                    1205 mV
    1.2 V_2                    1208 mV
    1.2 V_3                    1208 mV
    1.5 V_0                    1501 mV
    1.5 V_1                    1508 mV
    1.8 V                      1804 mV
    2.5 V                      2504 mV
    3.3 V                      3312 mV
    9.0 V                      8991 mV
    9.0 V bias                    0 mV
  Power (B)
    2.5 V                      2516 mV
    3.3 V                      3318 mV
    9.0 V                      9048 mV
SIB F13 1 status:
  State                       Online - Standby
  Temperature                 45 degrees C / 113 degrees F
  Temperature (B)             42 degrees C / 107 degrees F
  Power
    1.2 V_0                    1202 mV
    1.2 V_1                    1205 mV
    1.2 V_2                    1198 mV
    1.2 V_3                    1205 mV
    1.5 V_0                    1498 mV
    1.5 V_1                    1495 mV
```

```
    1.8 V                    1801 mV
    2.5 V                    2507 mV
    3.3 V                    3306 mV
    9.0 V                    8970 mV
    9.0 V bias                  0 mV
  Power (B)
    2.5 V                    2507 mV
    3.3 V                    3306 mV
    9.0 V                    8970 mV
SIB F13 3 status:
  State                     Online
  Temperature               48 degrees C / 118 degrees F
  Temperature (B)           43 degrees C / 109 degrees F
  Power
    1.2 V_0                  1208 mV
    1.2 V_1                  1195 mV
    1.2 V_2                  1202 mV
    1.2 V_3                  1198 mV
    1.5 V_0                  1504 mV
    1.5 V_1                  1504 mV
    1.8 V                    1801 mV
    2.5 V                    2510 mV
    3.3 V                    3312 mV
    9.0 V                    8970 mV
    9.0 V bias                  0 mV
  Power (B)
    2.5 V                    2500 mV
    3.3 V                    3332 mV
    9.0 V                    8970 mV
SIB F13 4 status:
  State                     Online
  Temperature               44 degrees C / 111 degrees F
  Temperature (B)           40 degrees C / 104 degrees F
  Power
    1.2 V_0                  1205 mV
    1.2 V_1                  1202 mV
    1.2 V_2                  1205 mV
    1.2 V_3                  1202 mV
    1.5 V_0                  1508 mV
    1.5 V_1                  1511 mV
    1.8 V                    1811 mV
    2.5 V                    2510 mV
    3.3 V                    3312 mV
    9.0 V                    8952 mV
    9.0 V bias                  0 mV
  Power (B)
    2.5 V                    2510 mV
    3.3 V                    3306 mV
    9.0 V                    9024 mV
SIB F13 6 status:
  State                     Online
  Temperature               49 degrees C / 120 degrees F
  Temperature (B)           46 degrees C / 114 degrees F
  Power
    1.2 V_0                  1195 mV
    1.2 V_1                  1198 mV
    1.2 V_2                  1202 mV
    1.2 V_3                  1202 mV
    1.5 V_0                  1501 mV
    1.5 V_1                  1495 mV
    1.8 V                    1801 mV
```

```
      2.5 V                   2507 mV
      3.3 V                   3306 mV
      9.0 V                   8979 mV
      9.0 V bias                 0 mV
    Power (B)
      2.5 V                   2497 mV
      3.3 V                   3318 mV
      9.0 V                   9006 mV
  SIB F13 7 status:
    State                    Online
    Temperature              52 degrees C / 125 degrees F
    Temperature (B)          48 degrees C / 118 degrees F
    Power
      1.2 V_0                 1198 mV
      1.2 V_1                 1198 mV
      1.2 V_2                 1202 mV
      1.2 V_3                 1189 mV
      1.5 V_0                 1498 mV
      1.5 V_1                 1498 mV
      1.8 V                   1804 mV
      2.5 V                   2491 mV
      3.3 V                   3292 mV
      9.0 V                   8904 mV
      9.0 V bias                 0 mV
    Power (B)
      2.5 V                   2500 mV
      3.3 V                   3306 mV
      9.0 V                   8952 mV
  SIB F13 8 status:
    State                    Online
    Temperature              54 degrees C / 129 degrees F
    Temperature (B)          49 degrees C / 120 degrees F
    Power
      1.2 V_0                 1211 mV
      1.2 V_1                 1208 mV
      1.2 V_2                 1208 mV
      1.2 V_3                 1211 mV
      1.5 V_0                 1508 mV
      1.5 V_1                 1511 mV
      1.8 V                   1801 mV
      2.5 V                   2513 mV
      3.3 V                   3324 mV
      9.0 V                   9048 mV
      9.0 V bias                 0 mV
    Power (B)
      2.5 V                   2516 mV
      3.3 V                   3318 mV
      9.0 V                   9102 mV
  SIB F13 9 status:
    State                    Online
    Temperature              46 degrees C / 114 degrees F
    Temperature (B)          41 degrees C / 105 degrees F
    Power
      1.2 V_0                 1205 mV
      1.2 V_1                 1202 mV
      1.2 V_2                 1205 mV
      1.2 V_3                 1198 mV
      1.5 V_0                 1504 mV
      1.5 V_1                 1504 mV
      1.8 V                   1817 mV
      2.5 V                   2507 mV
```

```
    3.3 V                     3306 mV
    9.0 V                     8991 mV
    9.0 V bias                   0 mV
  Power (B)
    2.5 V                     2510 mV
    3.3 V                     3332 mV
    9.0 V                     9006 mV
SIB F13 11 status:
  State                      Online
  Temperature                47 degrees C / 116 degrees F
  Temperature (B)            42 degrees C / 107 degrees F
  Power
    1.2 V_0                   1202 mV
    1.2 V_1                   1205 mV
    1.2 V_2                   1202 mV
    1.2 V_3                   1198 mV
    1.5 V_0                   1501 mV
    1.5 V_1                   1504 mV
    1.8 V                     1807 mV
    2.5 V                     2510 mV
    3.3 V                     3306 mV
    9.0 V                     8991 mV
    9.0 V bias                   0 mV
  Power (B)
    2.5 V                     2249 mV
    3.3 V                     4994 mV
    9.0 V                     9936 mV
SIB F13 12 status:
  State                      Online
  Temperature                44 degrees C / 111 degrees F
  Temperature (B)            40 degrees C / 104 degrees F
  Power
    1.2 V_0                   1208 mV
    1.2 V_1                   1202 mV
    1.2 V_2                   1208 mV
    1.2 V_3                   1205 mV
    1.5 V_0                   1511 mV
    1.5 V_1                   1508 mV
    1.8 V                     1814 mV
    2.5 V                     2507 mV
    3.3 V                     3318 mV
    9.0 V                     9039 mV
    9.0 V bias                   0 mV
  Power (B)
    2.5 V                     2516 mV
    3.3 V                     3344 mV
    9.0 V                     9006 mV
SIB F2S 0/0 status:
  State                      Online - Standby
  Temperature                40 degrees C / 104 degrees F
  Power
    1.2 V_1                      0 mV
    1.2 V_ASF                 1198 mV
    1.2 V_ASF_B               1198 mV
    1.2 V_ASF_D               1202 mV
    1.5 V                     1498 mV
    1.8 V                     1814 mV
    3.3 V                     3300 mV
    3.3 V bias                3300 mV
    3.3 V ASF                 3286 mV
    9.0 V                     8250 mV
```

```
SIB F2S 0/2 status:
  State                         Online - Standby
  Temperature                   40 degrees C / 104 degrees F
  Power
    1.2 V_1                        0 mV
    1.2 V_ASF                    1198 mV
    1.2 V_ASF_B                  1195 mV
    1.2 V_ASF_D                  1202 mV
    1.5 V                        1498 mV
    1.8 V                        1807 mV
    3.3 V                        3300 mV
    3.3 V bias                   3300 mV
    3.3 V ASF                    3292 mV
    9.0 V                        8250 mV
SIB F2S 0/4 status:
  State                         Online - Standby
  Temperature                   40 degrees C / 104 degrees F
  Power
    1.2 V_1                        0 mV
    1.2 V_ASF                    1198 mV
    1.2 V_ASF_B                  1195 mV
    1.2 V_ASF_D                  1202 mV
    1.5 V                        1501 mV
    1.8 V                        1817 mV
    3.3 V                        3300 mV
    3.3 V bias                   3300 mV
    3.3 V ASF                    3306 mV
    9.0 V                        8250 mV
SIB F2S 0/6 status:
  State                         Online - Standby
  Temperature                   39 degrees C / 102 degrees F
  Power
    1.2 V_1                        0 mV
    1.2 V_ASF                    1202 mV
    1.2 V_ASF_B                  1198 mV
    1.2 V_ASF_D                  1198 mV
    1.5 V                        1495 mV
    1.8 V                        1814 mV
    3.3 V                        3300 mV
    3.3 V bias                   3300 mV
    3.3 V ASF                    3280 mV
    9.0 V                        8250 mV
SIB F2S 1/0 status:
  State                         Online
  Temperature                   39 degrees C / 102 degrees F
  Power
    1.2 V_1                        0 mV
    1.2 V_ASF                    1195 mV
    1.2 V_ASF_B                  1192 mV
    1.2 V_ASF_D                  1195 mV
    1.5 V                        1492 mV
    1.8 V                        1798 mV
    3.3 V                        3300 mV
    3.3 V bias                   3300 mV
    3.3 V ASF                    3280 mV
    9.0 V                        8250 mV
SIB F2S 1/2 status:
  State                         Online
  Temperature                   39 degrees C / 102 degrees F
  Power
    1.2 V_1                        0 mV
```

```
    1.2 V_ASF                  1205 mV
    1.2 V_ASF_B                1202 mV
    1.2 V_ASF_D                1205 mV
    1.5 V                      1504 mV
    1.8 V                      1820 mV
    3.3 V                      3300 mV
    3.3 V bias                 3300 mV
    3.3 V ASF                  3306 mV
    9.0 V                      8250 mV
SIB F2S 1/4 status:
  State                       Online
  Temperature                 39 degrees C / 102 degrees F
  Power
    1.2 V_1                       0 mV
    1.2 V_ASF                  1202 mV
    1.2 V_ASF_B                1195 mV
    1.2 V_ASF_D                1198 mV
    1.5 V                      1498 mV
    1.8 V                      1811 mV
    3.3 V                      3300 mV
    3.3 V bias                 3300 mV
    3.3 V ASF                  3300 mV
    9.0 V                      8250 mV
SIB F2S 1/6 status:
  State                       Online
  Temperature                 39 degrees C / 102 degrees F
  Power
    1.2 V_1                       0 mV
    1.2 V_ASF                  1195 mV
    1.2 V_ASF_B                1192 mV
    1.2 V_ASF_D                1198 mV
    1.5 V                      1498 mV
    1.8 V                      1807 mV
    3.3 V                      3306 mV
    3.3 V bias                 3300 mV
    3.3 V ASF                  3292 mV
    9.0 V                      8250 mV
SIB F2S 2/0 status:
  State                       Online
  Temperature                 38 degrees C / 100 degrees F
  Power
    1.2 V_1                       0 mV
    1.2 V_ASF                  1195 mV
    1.2 V_ASF_B                1195 mV
    1.2 V_ASF_D                1198 mV
    1.5 V                      1498 mV
    1.8 V                      1804 mV
    3.3 V                      3300 mV
    3.3 V bias                 3300 mV
    3.3 V ASF                  3292 mV
    9.0 V                      8250 mV
...
```

### show chassis environment sib f13 (TX Matrix Plus Router)

user@host> **show chassis environment sib f13** ***0***

```
SIB F13 0 status:
  State                       Online - Standby
  Temperature                 54 degrees C / 129 degrees F
  Temperature (B)             50 degrees C / 122 degrees F
  Power
    1.2 V_0                    1202 mV
    1.2 V_1                    1202 mV
```

```
    1.2 V_2                    1208 mV
    1.2 V_3                    1208 mV
    1.5 V_0                    1501 mV
    1.5 V_1                    1504 mV
    1.8 V                      1801 mV
    2.5 V                      2504 mV
    3.3 V                      3318 mV
    9.0 V                      8991 mV
    9.0 V bias                    0 mV
  Power (B)
    2.5 V                      2510 mV
    3.3 V                      3318 mV
    9.0 V                      9024 mV
```

**show chassis environment sib f2s (TX Matrix Plus Router)**

```
user@host> show chassis environment sib f2s 0/2
SIB F2S 0/2 status:
  State                       Online - Standby
  Temperature                 40 degrees C / 104 degrees F
  Power
    1.2 V_1                       0 mV
    1.2 V_ASF                  1198 mV
    1.2 V_ASF_B                1195 mV
    1.2 V_ASF_D                1202 mV
    1.5 V                      1501 mV
    1.8 V                      1807 mV
    3.3 V                      3300 mV
    3.3 V bias                 3300 mV
    3.3 V ASF                  3286 mV
    9.0 V                      8250 mV
```

## show chassis ethernet-switch

**Syntax**

show chassis ethernet-switch
<errors <*port*>>

**Syntax (EX8200 Switch)**

show chassis ethernet-switch
<statistics <*port*> | switch <*number*>

**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*>

**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.

**Description**

(M10i, M40e, M120, M160, M320, MX Series, and T Series routers and EX8200 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**.

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.

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**.

statistics switch *number*—(TX Matrix Plus routers and EX8200 switch only) (Optional) Display traffic statistics for the specified Ethernet switch number. On the TX Matrix Plus router and EX8216 switch, replace ***number*** with a value from **0** through **2**. On the EX8208 switch, replace ***number*** with a value from **0** through **1**.

**Required Privilege Level** view

**List of Sample Output**

show chassis ethernet-switch on page 348
show chassis ethernet-switch (TX Matrix Router) on page 348
show chassis ethernet-switch errors on page 350
show chassis ethernet-switch statistics on page 350
show chassis ethernet-switch errors (TX Matrix Plus Router) on page 351
show chassis ethernet-switch sfc errors (TX Matrix Plus Router) on page 352
show chassis ethernet-switch statistics (TX Matrix Plus Router) on page 353

**Output Fields** Table 35 on page 347 lists the output fields for the **show chassis ethernet-switch** command. Output fields are listed in the approximate order in which they appear.

### Table 35: show chassis ethernet-switch Output Fields

| Field Name | Field Description |
|---|---|
| **Link is good on port n connected to device**<br><br>or<br><br>**Link is good on FE port n connected to device** | Information about the link between each port on the CB's Ethernet switch and one of the following devices:<br><br>• FPC0 (Flexible PIC Concentrator 0) through FPC7<br>• Local controller<br>• Other RE (on a system with two Routing Engines)<br>• SPMB (Switch Processor Mezzanine Board)<br>• (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 **Other RE** on the TX Matrix router, the speed is **1000 Mb**. |
| **Duplex is** | Duplex type of the Ethernet link: **full** or **half**. |
| **Auto-negotiate is enabled** | By default, both of the built-in Fast Ethernet ports on the M7i router 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 System Basics Configuration Guide*). |
| **MLT3** | Number of multilevel threshold-3 (MLT-3) Fast Ethernet errors detected. |
| Accumulated error counts for port n connected to device FPCn: (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. |
| **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 FPCn (statistics output only) | |
| **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 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. |

Table 35: show chassis ethernet-switch Output Fields *(continued)*

| Field Name | Field Description |
|---|---|
| **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. |

## Sample Output

### show chassis ethernet-switch

```
user@host> show chassis ethernet-switch
Link is good on port 0 connected to device: FPC0
  Speed is 100Mb
  Duplex is full

Link is good on port 1 connected to device: FPC1
  Speed is 100Mb
  Duplex is full

Link is good on port 2 connected to device: FPC2
  Speed is 100Mb
  Duplex is full

Link is good on port 3 connected to device: FPC3
  Speed is 100Mb
  Duplex is full

Link is good on port 7 connected to device: Local controller
  Speed is 100Mb
  Duplex is full

Link is good on port 9 connected to device: SPMB
  Speed is 100Mb
  Duplex is full

Link is good on port 13 connected to device: FPC5
  Speed is 100Mb
  Duplex is full
```

### 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 100Mb
  Duplex is full
  Autonegotiate is Enabled

Link is good on FE port 6 connected to device: LCC2
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled

Link is good on FE port 8 connected to device: SPMB
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled

lcc0-re0:
--------------------------------------------------------------------------
Link is good on FE port 1 connected to device: FPC1
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled

Link is good on FE port 2 connected to device: FPC2
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled

Link is good on FE port 8 connected to device: SPMB
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled

Link is good on FE port 10 connected to device: SCC
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled

lcc2-re0:
--------------------------------------------------------------------------
Link is good on FE port 0 connected to device: FPC0
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled

Link is good on FE port 1 connected to device: FPC1
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled

Link is good on FE port 2 connected to device: FPC2
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled

Link is good on FE port 8 connected to device: SPMB
  Speed is 100Mb
  Duplex is full
  Autonegotiate is Enabled

Link is good on FE port 10 connected to device: SCC
  Speed is 100Mb
```

```
  Duplex is full
  Autonegotiate is Enabled
```

**show chassis ethernet-switch errors**

```
user@host> show chassis ethernet-switch errors
Accumulated error counts for port 0 connected to device FPC0:
  MLT3           2
  Lock           0
  Xmit           0
  ESD            0
  False carrier  2
  Disconnects    0
  FX mode        0
Accumulated error counts for port 1 connected to device FPC1:
  MLT3           2
  Lock           0
  Xmit           0
  ESD            0
  False carrier  2
  Disconnects    0
  FX mode        0
Accumulated error counts for port 2 connected to device FPC2:
  MLT3           2
  Lock           0
  Xmit           0
  ESD            0
  False carrier  3
  Disconnects    0
  FX mode        0
Accumulated error counts for port 3 connected to device FPC3:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
  False carrier  0
  Disconnects    0
Accumulated error counts for port 4 connected to device Nothing:
   MLT3           0
   Lock           0
   Xmit           0
   ESD            0
   False carrier  0
   Disconnects    0
   FX mode        0
...
```

**show chassis ethernet-switch statistics**

```
user@host> show chassis ethernet-switch statistics
Statistics for port 0 connected to device FPC0:
   TX Unicast packets          68113
   TX Multicast packets        0
   TX Broadcast packets        20851
   TX Late collisions          0
   TX Excessive collisions     0
   TX Dropped packets          0

   RX Unicast packets          67410
   RX Multicast packets        0
   RX Broadcast packets        20852
   RX FCS Errors               0
   RX Alignment Errors         0
   RX Dropped Packets          0
   RX Fragments                0
```

```
   RX Symbol Errors            0

Statistics for port 1 connected to device FPC1:
   TX Unicast packets          66496
   TX Multicast packets        0
   TX Broadcast packets        20080
   TX Late collisions          0
   TX Excessive collisions     0
   TX Dropped packets          0

   RX Unicast packets          66037
   RX Multicast packets        0
   RX Broadcast packets        20080
   RX FCS Errors               0
   RX Alignment Errors         0
   RX Dropped Packets          0
   RX Fragments                0
   RX Symbol Errors            0

Statistics for port 2 connected to device FPC2:
   TX Unicast packets          64206
   TX Multicast packets        0
   TX Broadcast packets        21183
   TX Late collisions          0
   TX Excessive collisions     0
   TX Dropped packets          0

   RX Unicast packets          63671
   RX Multicast packets        0
   RX Broadcast packets        21183
   RX FCS Errors               0
   RX Alignment Errors         0
   RX Dropped Packets          0
   RX Fragments                0
   RX Symbol Errors            0
Statistics for port 3 connected to device FPC3:
...
```

### show chassis ethernet-switch errors (TX Matrix Plus Router)

```
user@host> show chassis ethernet-switch errors
sfc0-re0:
--------------------------------------------------------------------------
Displaying error for switch 0

Displaying error for switch 1
Accumulated error counts for port 0 connected to device LCC0:
  MLT3          0
  Lock          0
  Xmit          0
  ESD           0
  False carrier  0
  Disconnects   0
  FX mode       0

lcc0-re0:
--------------------------------------------------------------------------
Displaying error for switch 0
Accumulated error counts for port 6 connected to device FPC0:
  MLT3          0
  Lock          0
  Xmit          0
  ESD           0
```

```
  False carrier  5
  Disconnects    0
  FX mode        0
Accumulated error counts for port 7 connected to device FPC1:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
  False carrier  7
  Disconnects    0
  FX mode        0
Accumulated error counts for port 19 connected to device Other RE:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
  False carrier  0
  Disconnects    0
  FX mode        0
Accumulated error counts for port 20 connected to device SFC0:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
  False carrier  0
  Disconnects    0
  FX mode        0
```

**show chassis ethernet-switch sfc errors (TX Matrix Plus Router)**

```
user@host> show chassis ethernet-switch errors switch sfc
sfc0-re0:
--------------------------------------------------------------------------
Displaying error for switch 1
Accumulated error counts for port 0 connected to device LCC0:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
  False carrier  0
  Disconnects    0
  FX mode        0
Accumulated error counts for port 2 connected to device LCC1:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
  False carrier  0
  Disconnects    0
  FX mode        0
Accumulated error counts for port 4 connected to device LCC2:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
  False carrier  0
  Disconnects    0
  FX mode        0
Accumulated error counts for port 6 connected to device LCC3:
  MLT3           0
  Lock           0
  Xmit           0
  ESD            0
```

```
  False carrier  0
  Disconnects    0
  FX mode        0

lcc0-re0:
--------------------------------------------------------------------------
error: command is not valid on the t1600

lcc1-re0:
--------------------------------------------------------------------------
error: command is not valid on the t1600

lcc2-re0:
--------------------------------------------------------------------------
error: command is not valid on the t1600

lcc3-re0:
--------------------------------------------------------------------------
error: command is not valid on the t1600
```

### show chassis ethernet-switch statistics (TX Matrix Plus Router)

```
user@host> show chassis ethernet-switch statistics
sfc0-re0:
--------------------------------------------------------------------------
Displaying port statistics for switch 0
Statistics for port 1 connected to device 1GSW:
  TX Packets 64 Octets        5183577
  TX Packets 65-127 Octets    67820
  TX Packets 128-255 Octets   772
  TX Packets 256-511 Octets   136
  TX Packets 512-1023 Octets  68
  TX Packets 1024-1518 Octets  10881
  TX Packets 1519-2047 Octets  0
  TX Packets 2048-4095 Octets  0
  TX Packets 4096-9216 Octets  0
  TX Packets 9217-16383 Octets  0
  TX Octets                   5263254
  TX Multicast Packets        16
  TX Broadcast Packets        723403
  TX PAUSEMAC Ctrl Frames     0
  TX Oversize Packets         0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             349922253
  TX Packet OK Counter        5263254
  TX Pause Packet Counter     0
  TX Unicast Counter          4539835
  RX Packets 64 Octets        6513629
  RX Packets 65-127 Octets    88761
  RX Packets 128-255 Octets   6382
  RX Packets 256-511 Octets   22027
  RX Packets 512-1023 Octets  4319
  RX Packets 1024-1518 Octets  49922
  RX Packets 1519-2047 Octets  0
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Packets 9217-16383 Octets  0
  RX Octets                   6685040
  RX Multicast Packets        4
  RX Broadcast Packets        2137376
  RX FCS Errors               0
  RX Fragments                0
```

```
    RX MAC Control Packets      0
    RX Out of Range Length      0
    RX Undersize Packets        0
    RX Oversize Packets         0
    RX Jabbers                  0
    RX Control Frame Counter    0
    RX Pause Frame Counter      0
    RX Byte Counter             509224602
    RX Unicast Frame Count      4547660
    RX Packet OK Count          6685040
  Statistics for port 9 connected to device RE1:
    TX Packets 64 Octets        2500318
    TX Packets 65-127 Octets    443
    TX Packets 128-255 Octets   0
    TX Packets 256-511 Octets   0
    TX Packets 512-1023 Octets  0
    TX Packets 1024-1518 Octets  0
    TX Packets 1519-2047 Octets  0
    TX Packets 2048-4095 Octets  0
    TX Packets 4096-9216 Octets  0
    TX Packets 9217-16383 Octets  0
    TX Octets                   2500761
    TX Multicast Packets        4
    TX Broadcast Packets        2500757
    TX PAUSEMAC Ctrl Frames     0
    TX Oversize Packets         0
    TX FCS Error Counter        0
    TX Fragment Counter         0
    TX Byte Counter             160049670
    TX Packet OK Counter        0
    TX Pause Packet Counter     0
    TX Unicast Counter          0
    RX Packets 64 Octets        701191
    RX Packets 65-127 Octets    5882
    RX Packets 128-255 Octets   2
    RX Packets 256-511 Octets   0
    RX Packets 512-1023 Octets  17965
    RX Packets 1024-1518 Octets  7
    RX Packets 1519-2047 Octets  0
    RX Packets 2048-4095 Octets  0
    RX Packets 4096-9216 Octets  0
    RX Packets 9217-16383 Octets  0
    RX Octets                   725047
    RX Multicast Packets        8
    RX Broadcast Packets        2500757
    RX FCS Errors               0
    RX Fragments                0
    RX MAC Control Packets      0
    RX Out of Range Length      0
    RX Undersize Packets        0
    RX Oversize Packets         0
    RX Jabbers                  0
    RX Control Frame Counter    0
    RX Pause Frame Counter      0
    RX Byte Counter             62402656
    RX Unicast Frame Count      0
    RX Packet OK Count          0
  Statistics for port 17 connected to device RE0:
    TX Packets 64 Octets        7214818
    TX Packets 65-127 Octets    94640
    TX Packets 128-255 Octets   6384
```

```
  TX Packets 256-511 Octets   22027
  TX Packets 512-1023 Octets  22284
  TX Packets 1024-1518 Octets  49929
  TX Packets 1519-2047 Octets  0
  TX Packets 2048-4095 Octets  0
  TX Packets 4096-9216 Octets  0
  TX Packets 9217-16383 Octets  0
  TX Octets                   7410082
  TX Multicast Packets        12
  TX Broadcast Packets        2497247
  TX PAUSEMAC Ctrl Frames     0
  TX Oversize Packets         0
  TX FCS Error Counter        0
  TX Fragment Counter         0
  TX Byte Counter             571626932
  TX Packet OK Counter        0
  TX Pause Packet Counter     0
  TX Unicast Counter          0
  RX Packets 64 Octets        4823701
  RX Packets 65-127 Octets    67812
  RX Packets 128-255 Octets   772
  RX Packets 256-511 Octets   136
  RX Packets 512-1023 Octets  68
  RX Packets 1024-1518 Octets  10881
  RX Packets 1519-2047 Octets  0
  RX Packets 2048-4095 Octets  0
  RX Packets 4096-9216 Octets  0
  RX Packets 9217-16383 Octets  0
  RX Octets                   4903370
  RX Multicast Packets        8
  RX Broadcast Packets        2497247
  RX FCS Errors               0
  RX Fragments                0
  RX MAC Control Packets      0
  RX Out of Range Length      0
  RX Undersize Packets        0
  RX Oversize Packets         0
  RX Jabbers                  0
  RX Control Frame Counter    0
  RX Pause Frame Counter      0
  RX Byte Counter             326889517
  RX Unicast Frame Count      0
  RX Packet OK Count          0

Displaying port statistics for switch 1
Statistics for port 0 connected to device LCC0:
  TX Packets 64 Octets        5053443
  TX Packets 65-127 Octets    59737
  TX Packets 128-255 Octets   768
  TX Packets 256-511 Octets   87
  TX Packets 512-1023 Octets  68
  TX Packets 1024-1518 Octets  85
  TX Packets 1519-2047 Octets  0
  TX Packets 2048-4095 Octets  0
  TX Packets 4096-9216 Octets  0
  TX 1519-1522 Good Vlan frms  0
  TX Octets                   5114188
  TX Multicast Packets        16
  TX Broadcast Packets        1125742
  TX Single Collision frames  0
  TX Mult. Collision frames   0
```

```
  TX Late Collisions          0
  TX Excessive Collisions     0
  TX Collision frames         0
  TX PAUSEMAC Ctrl Frames     0
  TX MAC ctrl frames          0
  TX Frame deferred 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 fan

**Syntax**

show chassis fan

**Syntax (QFabric Switches)**

show chassis fan
<interconnect-device *name*>

**Release Information**

Command introduced in JUNOS Release 10.0.
Command introduced in Junos OS Release 11.1 for the QFX Series.

**Description**

(T Series routers, MX Series 3D Universal EdgeRouters. and QFX3108 Interconnect devices only) Show information about the fan tray and fans.

**Options**

This command has no options.

**Required Privilege Level**

view

**List of Sample Output**

show chasis fan on page 358
show chasis fan (QFabric Switches) on page 359

**Output Fields**

Table 36 on page 358 lists the output fields for the **show chassis fan** command. Output fields are listed in the approximate order in which they appear.

### Table 36: show chassis fan Output Fields

| Field Name | Field Description |
|---|---|
| **Item** | Fan item identifier. |
| **Status** | Status of the fan:<br>• **OK**-Fan is running properly and within the normal range.<br>• **Check**-Fan is in **Check** state because of some fault or alarm condition. |
| **RPM** | Fan speed in revolutions per minute (RPM). |
| **Measurement** | Fan speed status based on different chassis cooling requirements:<br>• Spinning at high speed<br>• Spinning at intermediate-speed<br>• Spinning at low speed |

## Sample Output

**show chasis 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 chasis fan (QFabric Switches)

user@host> **show chassis fan interconnect-device *interconnect1***

```
user@host> show chassis fan interconnect1
      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 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 360

**Output Fields** Table 37 on page 360 lists the output fields for the **show chassis fabric feb** command.

Table 37: 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*)>

**Release Information**

Command introduced in Junos OS Release 10.0.

**Description**

(TX Matrix Plus routers only) 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**

fpc *slot-number*—Show error log of the first ten and last ten errors for the specified FPC. 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 T1600 router (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 T1600 router 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:

- ***sib-slot***—Replace ***sib-slot*** with a value ranging from **0** through **4**.
- f13 ***sib-slot***—(Optional) Show SIB F13 errors. Replace ***sib-slot*** with 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 T1600 router (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 362
show chassis fabric errors (F2S SIB Errors on a TX Matrix Plus Router) on page 362
show chassis fabric errors (SIB Errors Specific to an LCC Connected to a TX Matrix Plus Router) on page 362
show chassis fabric errors (FPC Errors Specific to an LCC Connected to a TX Matrix Plus Router) on page 363

**Output Fields**
Table 38 on page 362 lists the output fields for the **show chassis fabric errors** command. Output fields are listed in the approximate order in which they appear.

### Table 38: show chassis fabric errors Output Fields

| Field Name | Field Description |
|---|---|
| **Time** | Time the error was logged. |
| **Error log of first 10 errors** | List of the first ten errors. |
| **Error log of last 10 errors** | List of the last ten errors. |

## Sample Output

**show chassis fabric errors (F13 SIB Errors on a TX Matrix Plus Router)**

```
user@host> show chassis fabric errors sib f13 11

Time                          Error log of first 10 errors
2009-10-06 02:21:17 PDT       LOS on Cable-D(1,0)
```

**show chassis fabric errors (F2S SIB Errors on a TX Matrix Plus Router)**

```
user@host> show chassis fabric errors sib f2s 0/0

Time                          Error log of first 10 errors
2009-10-06 13:51:42 PDT       Cell drop errors on CLOS F2 SF 0 Port 0 link
```

**show chassis fabric errors (SIB Errors Specific to an LCC Connected to a TX Matrix Plus Router)**

```
user@host> show chassis fabric errors sib 1 lcc 0
lcc0-re0:

--------------------------------------------------------------------------

Time                          Error log of first 10 errors
```

```
2009-10-06 02:23:16 PDT      Cell drop errors on FPC7_T link

2009-10-06 02:23:16 PDT      Cell drop errors on FPC7_B link
```

**show chassis fabric errors (FPC Errors Specific to an LCC Connected to a TX Matrix Plus Router)**

```
user@host> show chassis fabric errors fpc 5 lcc 0
lcc0-re0:

--------------------------------------------------------------------------

Time                         Error log of first 10 errors

2009-10-06 13:56:59 PDT      PFE_T has link error on plane 1
```

## show chassis fabric fpcs

**Syntax**

show chassis fabric fpcs
<lcc *number*>

**Syntax (MX Series Router)**

show chassis fabric fpcs
<all-members>
<local>
<member *member-id*>

**Release Information**

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.4 for EX Series switches.

**Description**

(M320, MX Series, and T Series routers and EX8200 switches only) Display the state of the electrical and optical 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.

**Required Privilege Level**

view

**List of Sample Output**

show chassis fabric fpcs (M320 Router) on page 365
show chassis fabric fpcs (MX240 Router) on page 366
show chassis fabric fpcs (MX480 Router) on page 366
show chassis fabric fpcs (MX960 Router) on page 367
show chassis fabric fpcs (T320 Router) on page 368
show chassis fabric fpcs (T640 Router) on page 369
show chassis fabric fpcs (TX Matrix Router) on page 369
show chassis fabric fpcs (T1600 Router) on page 370

show chassis fabric fpcs (TX Matrix Plus Router) on page 372
show chassis fabric fpcs lcc (TX Matrix Plus Router) on page 379
show chassis fabric fpcs (EX8200 Switch) on page 380

**Output Fields** Table 39 on page 365 lists the output fields for the **show chassis fabric fpcs** command. Output fields are listed in the approximate order in which they appear.

### Table 39: 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:<br>• **Unused**—FPC is not present.<br>• **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.<br>NOTE: In Junos OS Release 9.6 and later, the list of Packet Forwarding Engines with destination errors is displayed in the output.<br>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.<br>• **Links ok**—Link between the spare SIB and FPC is eligible to carry traffic.<br>• **Link error**—Link between the SIB and FPC has CRC errors. However, the link is still eligible to carry traffic.<br>• **Plane disabled**—Fabric plane has been disabled for the following reasons:<br>  ◦ Destination errors have exceeded the thresholds.<br>  ◦ Run-time link errors have exceeded the thresholds.<br>  ◦ Initialization time link errors detected, and link training was unsuccessful.<br>• **Plane enabled**—Link between the active SIB and FPC is eligible to carry traffic.<br>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. |

## 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 (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 (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 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 383
show chassis fabric map (MX Series Routers) on page 383
show chassis fabric map plane 1 (EX8200 Switch) on page 387

**Output Fields**

Table 40 on page 383 lists the output fields for the **show chassis fabric map** command. Output fields are listed in the approximate order in which they appear.

### Table 40: 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:<br>• **RESET**—Link between SIB and FPC/DPC is powered down on purpose. This is done in all non-dual PFE based boards.<br>• **UP**—Link between SIB and FPC/DPC is up and running.<br>• **DOWN**—Link between SIB and FPC/DPC is powered down.<br>• **FAULT**—SIB is in alarmed state where the SIB's plane is not operational for the following reasons:<br>  ◦ On-board F-chip is not operational.<br>  ◦ Fiber optic connector faults.<br>  ◦ FPC connector faults.<br>  ◦ 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 Router)**

show chassis fabric plane
<detail | extensive | terse>
<lcc *number* | sfc *number*>

**Syntax (MX Series Router)**

show chassis fabric plane
<detail | extensive | terse>
<all-members>
<local>
<member *member-id*>

**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.

**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**

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

**List of Sample Output**

show chassis fabric plane (M120 Router) on page 395
show chassis fabric plane (MX240 Router) on page 395
show chassis fabric plane (MX480 Router) on page 397
show chassis fabric plane (MX960 Router) on page 398
show chassis fabric plane (TX Matrix Plus Router) on page 399
show chassis fabric plane detail (TX Matrix Plus Router) on page 399
show chassis fabric plane extensive (TX Matrix Plus Router) on page 400
show chassis fabric plane terse (TX Matrix Plus Router) on page 402
show chassis fabric plane lcc (TX Matrix Plus Router) on page 402
show chassis fabric plane sfc (TX Matrix Plus Router) on page 403
show chassis fabric plane (T1600 Router) on page 403
show chassis fabric plane extensive (T1600 Router) on page 403
show chassis fabric plane detail (T1600 Router) on page 406
show chassis fabric plane extensive (TX Matrix Plus Router) on page 406
show chassis fabric plane (EX8200 Switch) on page 409

**Output Fields**

Table 41 on page 390 lists the output fields for the **show chassis fabric plane** command. Output fields are listed in the approximate order in which they appear.

### Table 41: 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:<br>• **ACTIVE**—SIB is operational and running.<br>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.<br>• **FAULTY**— SIB is in alarmed state where the SIB's plane is not operational for the following reasons:<br>  • On-board fabric ASIC is not operational.<br>  • Fiber optic connector faults.<br>  • FPC connector faults.<br>  • SIB midplane connector faults. | none |

Table 41: show chassis fabric plane Output Fields *(continued)*

<table>
<tr><th>Field Name</th><th>Field Description</th><th>Level of output</th></tr>
<tr><td>FEB</td><td>(M120 routers only) FEB number and state of links to each FEB:<ul><li>Link error—Link between SIB and FPC is not operational.</li><li>Links ok—Link between SIB and FPC is active.</li><li>Unused—No FPC is present.</li></ul></td><td>none</td></tr>
<tr><td>FPC</td><td>(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 slotfor which the FPC is installed.</td><td>none</td></tr>
<tr><td>PFE</td><td>(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.<br><br>Links ok: Link between SIB and FPC is active.Link error: Link between SIB and FPC is not operational.Unused: No FPC is present.</td><td>none</td></tr>
<tr><td>State</td><td>(TX Matrix Plus and T1600 routers in a routing matrix only)—State of the fabric plane:<ul><li>Online: Fabric plane is operational and running and links on the SIB are operational.</li><li>Offline: Fabric plane state is Offline because the plane does not have four or more F2S and one F13 online.</li><li>Empty: Fabric plane state is Empty if all SIBs in the plane are absent.</li><li>Spare: Fabric plane is redundant and can be operational if the operational fabric plane encounters an error.</li><li>Check: Fabric plane is in alarmed state due to the following reason and the cause of the error must be resolved:<ul><li>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.</li></ul></li><li>Fault: Fabric plane is in alarmed state if one or more SIBs belonging to the plane are in the Fault state. A SIB can be in the Fault state because of the following reasons:<ul><li>On-board fabric ASIC is not operational.</li><li>Fiber optic connector faults.</li><li>FPC connector faults.</li><li>SIB midplane connector faults.</li><li>Link errors have exceeded the threshold.</li></ul></li></ul></td><td>none</td></tr>
<tr><td>Uptime</td><td>(TX Matrix Plus and T1600 routers in a routing matrix only)—Time the fabric plane has been up and running.</td><td>none</td></tr>
</table>

## Table 41: show chassis fabric plane Output Fields *(continued)*

<table>
<tr><th>Field Name</th><th>Field Description</th><th>Level of output</th></tr>
<tr><td colspan="3">Fabric Management Plane State Output Fields for the show chassis fabric plane extensive Command on a TX Matrix Plus Router</td></tr>
<tr><td>PLANE number</td><td>State of the fabric plane:<ul><li>Online: Fabric plane is operational and running and links on the SIB are operational.</li><li>Offline: Fabric plane state is Offline because the plane does not have 4 or more F2S and 1 F13 online.</li><li>Empty: Fabric plane state is Empty if all SIBs in the plane are absent.</li><li>Spare: Fabric plane is redundant and can be operational if the operational fabric plane encounters an error.</li><li>Check: Fabric plane is in alarmed state due to the following reasons and the cause of the error must be resolved:<ul><li>One or more SIBs (belonging to the fabric plane) in the Online or Spare states has transitioned to the Check state.<br>Check state of the SIB can be caused because of link errors or destination errors.</li></ul></li><li>Fault: Fabric plane is in alarmed state if one or more SIBs belonging to the plane are in the Fault state. A SIB can be in the Fault state because of the following reasons:<ul><li>On-board fabric ASIC is not operational.</li><li>Fiber optic connector faults.</li><li>FPC connector faults.</li><li>SIB midplane connector faults.</li><li>Link errors have exceeded the threshold.</li></ul></li></ul></td><td>extensive</td></tr>
</table>

Table 41: 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:<br>• **Activating**—Transitional state when the SIB is transitioning to the **Online** or **Spare** state.<br>• **Deactivating**—Transitional state when the SIB is going offline.<br>• **Online**—SIB is operational and running.<br>• **Offline**—SIB is powered down.<br>• **Spare**—SIB is redundant and will move to active state if one of the working SIBs fails to pass traffic.<br>• **Empty**—No SIB is present.<br>• **Fault**— SIB is in alarmed state because of the following reasons and the cause of the error must be resolved:<br>  ◦ On-board fabric ASIC is not operational.<br>  ◦ Fiber optic connector faults.<br>  ◦ FPC connector faults.<br>  ◦ SIB midplane connector faults.<br>  ◦ Link errors have exceeded the threshold<br>• **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.<br>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:<br>• **Links ok**—Links between the TXP-F13 SIB on the SFC and the LCC is active.<br>• **Link error**—Link between the TXP-F13 SIB on the SFC and the LCC is not operational.<br>• **Unused**—No SIB is present. | **extensive** |
| **SG *number* Port *number*** | State of the SG chip ports on the LCC:<br>• **Links ok**—Link is active.<br>• **Link error**—Link is not operational.<br>• **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** |

## Table 41: show chassis fabric plane Output Fields *(continued)*

| Field Name | Field Description | Level of output |
|---|---|---|
| **Fabric Management SIB State Output Fields for the show chassis fabric plane extensive Command on a TX Matrix Plus Router** | | |
| SIB *slot-number* | State of the SIBs on the T1600 router (LCC) in the routing matrix:<br>• **Activating**—Transitional state when the SIB is coming online.<br>• **Deactivating**—Transitional state when the SIB is going offline.<br>• **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.<br>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.<br>• **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.<br>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.<br>**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<br>NOTE: The **Connected**, **Disconnected**, and **SFC Error** states are only applicable to the SIBs on an LCC.<br>• **Online**—SIB is operational and running.<br>• **Offline**—SIB is powered down.<br>• **Spare**—SIB is redundant and will move to active state if one of the working SIBs fails to pass traffic.<br>• **Empty**—No SIB is present.<br>• **Fault**— SIB is in alarmed state where the SIB's plane is not operational for the following reasons:<br>  ◦ On-board fabric ASIC is not operational.<br>  ◦ Fiber optic connector faults.<br>  ◦ FPC connector faults.<br>  ◦ SIB midplane connector faults.<br>  ◦ Link errors have exceeded the threshold<br>• **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.<br>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 41: show chassis fabric plane Output Fields *(continued)*

| Field Name | Field Description | Level of output |
|---|---|---|
| **LCC SIB Link State** | State of the LCC SIB link:<br>• **Links ok**—Link is active.<br>• **Link error**—Link is not operational.<br>• **Unused**—SIB is not in use. | **extensive** |
| **SG** ***number*** **Port** ***number*** | State of the SG chip ports on the LCC:<br>• **Links ok**—Link is active.<br>• **Link error**—Link is not operational.<br>• **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 (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 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 Router)** show chassis fabric plane-location
<all-members>
<local>
<member *member-id*>

**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 TX Matrix Plus router 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.

**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 412
show chassis fabric plane-location (MX240 and MX480 Routers) on page 412
show chassis fabric plane-location (MX960 Router) on page 412
show chassis fabric plane-location (TX Matrix Plus Router) on page 412
show chassis fabric plane-location (EX8200 Switch) on page 412

**Output Fields** Table 42 on page 411 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 42: show chassis fabric plane-location Output Fields

| Field Name | Field Description |
|---|---|
| **Plane *n*** | Plane number. |
| **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. |

### Table 42: show chassis fabric plane-location Output Fields *(continued)*

| Field Name | Field Description |
|---|---|
| **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. |

## Sample Output

**show chassis fabric plane-location (M120 Router)**

```
user@host> show chassis fabric plane-location
------------Fabric Plane Locations-------------
Plane 0                         Control Board 0
Plane 1                         Control Board 0
Plane 2                         Control Board 1
Plane 3                         Control Board 1
```

**show chassis fabric plane-location (MX240 and MX480 Routers)**

```
user@host> show chassis fabric plane-location
------------Fabric Plane Locations-------------
Plane 0                         Control Board 0
Plane 1                         Control Board 0
Plane 2                         Control Board 0
Plane 3                         Control Board 0
Plane 4                         Control Board 1
Plane 5                         Control Board 1
Plane 6                         Control Board 1
Plane 7                         Control Board 1
```

**show chassis fabric plane-location (MX960 Router)**

```
user@host> show chassis fabric plane-location
------------Fabric Plane Locations-------------
Plane 0                         Control Board 0
Plane 1                         Control Board 0
Plane 2                         Control Board 1
Plane 3                         Control Board 1
Plane 4                         Control Board 2
Plane 5                         Control Board 2
```

**show chassis fabric plane-location (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 sibs

**Syntax**

show chassis fabric sibs
<lcc *number* | scc>

**Release Information**

Command introduced before Junos OS Release 7.4.

**Description**

Display the state of the electrical and optical switch fabric links:

- Between the Switch Interface Boards (SIBs) and Flexible PIC Concentrators (FPCs) in the M320 routers (M320 SIBs).
- Between the SIBs in the TX Matrix router (TX SIBs) and the SIBs in the T640 routers (T640 SIBs).
- Between the T640 SIBs and the FPCs in a T640 router.

**Options**

none—Display the switching fabric link state for the M320 SIBs in the M320 routers, TX SIBs in the TX Matrix router and for the T640 SIBs in all the T640 routers connected to a TX Matrix router.

lcc *number*—(Optional) Display the switching fabric link state for the T640 SIBs in 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

**List of Sample Output**

show chassis fabric sibs (M320 Router) on page 415
show chassis fabric sibs (T640 Router) on page 416
show chassis fabric sibs (T1600 Router) on page 417
show chassis fabric sibs (TX Matrix Router) on page 418
show chassis fabric sibs lcc (TX Matrix Router) on page 420
show chassis fabric sibs scc (TX Matrix Router) on page 421

**Output Fields**

Table 43 on page 414 lists the output fields for the**show chassis fabric sibs** command. Output fields are listed in the approximate order in which they appear.

### Table 43: 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:<br>• **Unused**—SIB is not present.<br>• **Links ok**—Link between the SIB and the FPC is active.<br>• **Link error**—Link between the SIB and the FPC is not operational. |

Table 43: show chassis fabric sibs Output Fields *(continued)*

| Field Name | Field Description |
| --- | --- |
| **Plane state** | Possible plane state of the M320 SIB, TX SIB or T640 SIB:<br>• **S_ACTIVE**—Links on the SIB are operational, and the fabric plane (SIB) is operational and running.<br>• **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.<br>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.<br>• **S_EMPTY**—No links are present on the SIB, and the fabric plane (SIB) is powered down.<br>• **S_ACTIVATING**—Links on the SIB are coming online; this is a transitional state.<br>• **S_DEACTIVATING**—Links on the SIB are going offline; this is a transitional state.<br>• **S_FAULTING**—Links on the SIB are being marked faulty, and the fabric plane (SIB) is not operational.<br>• **S_FAULT**—Links on the SIB are in an alarmed state, and the fabric plane (SIB) is not operational for the following reasons:<br>  • On-board F-chip is not operational.<br>  • Fiber optic connector faults.<br>  • 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 (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-number*>

**Syntax (TX Matrix Router)**

show chassis fabric topology
<lcc *number* | scc>
<*sib-slot-number*>

**Syntax (TX Matrix Plus Router)**

show chassis fabric topology
<lcc *number* | sfc *number*>
<*sib-slot-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**

(TX Matrix, TX Matrix Plus, and T Series routers only) On the TX Matrix router. display the state of the switching fabric topology for the Switch Interface Board (SIB) connection between the TX Matrix router and the T640 routers. On the TX Matrix Plus router. display the state of the switching fabric topology for the SIB connection between the TX Matrix Plus router and the T1600 routers.

**Options**

none—Display the fabric topology state for the TX Matrix router and for all the T640 routers connected to it.

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-number*—(Optional) Display the fabric topology state for a specified SIB slot. Replace ***sib-slot-number*** with a value from **0** through **4**. On a TX Matrix Plus router, replace ***sib-slot-number*** with a value from **0** through **15**.

**Required Privilege Level**

view

**List of Sample Output**

show chassis fabric topology scc (TX Matrix Router) on page 426
show chassis fabric topology lcc on page 428
show chassis fabric topology (TX Matrix Plus Router) on page 430
show chassis fabric topology sfc (TX Matrix Plus Router) on page 432
show chassis fabric topology lcc (TX Matrix Plus Router) on page 433

**Output Fields**

Table 44 on page 424 lists the output fields for the **show chassis fabric topology** command. Output fields are listed in the approximate order in which they appear.

### Table 44: show chassis fabric topology Output Fields

| Field Name | Field Description |
|---|---|
| **in-links** | Fabric topology for receive side links. |
| **out-links** | Fabric topology for transmit side links. |
| **state** | State of the fabric link:<br>• **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.<br>• **UP**—Link between the SIB and the FPC/DCP is up and running.<br>• **DOWN**—Link between the SIB and the FPC/DCP is powered down.<br>• **FAULT**—SIB is in the alarmed state, in which the SIB's plane is not operational for the following reasons:<br>  ◦ On-board F-chip is not operational.<br>  ◦ Fiber-optic connector faults.<br>  ◦ FPC connector faults.<br>  ◦ SIB midplane connector faults. |

### Table 44: 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:<br>◦ **OK**—Optical signal power is good.<br>◦ **Error**—Internal error.<br>◦ **LOS**—Loss of Signal detected.<br>◦ **High Cur**—The Tx Bias-current is higher than threshold on this channel. This is applicable only to Tx Channels.<br>◦ **Low Cur** —The Tx Bias-current is lower than threshold on this channel. This is applicable only to Tx Channels.<br>• **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:<br>• **Up**—Channel is up.<br>• **Down**—Channel is down.<br>• **Reset**—Channel has been reset.<br>• **Fault**—Channel has faults.<br>The following is a sample output with description of the fields displayed in the output for Out-Links:<br>`Out-Links:`<br>`=========`<br>`SF_3_13_FB_A(21,09) -> FPC7_B_SG(3,3,6)_FB_A(18,09)      OK`<br>`203     Up` |

### Table 44: show chassis fabric topology Output Fields *(continued)*

- **SF_3_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. 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_1_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_1**—Indicates F1 mode and Rx path.
- **SF_1_00_FB_D(01,11)** —Indicates F1 mode 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:
--------------------------------------------------------------------------

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_1_00_FB_D(01,11)     OK       12      Up
FPC0_T_SG(0,0,1)_FB_D(04,10)  -> SF_1_00_FB_D(01,10)     OK       12      Up
FPC0_T_SG(0,0,2)_FB_D(04,09)  -> SF_1_00_FB_D(01,09)     OK       12      Up
FPC0_T_SG(0,0,3)_FB_D(04,08)  -> SF_1_00_FB_D(01,08)     OK       12      Up
FPC0_T_SG(0,0,4)_FB_D(04,07)  -> SF_1_00_FB_D(01,07)     OK       12      Up
FPC0_T_SG(0,0,5)_FB_D(04,06)  -> SF_1_00_FB_D(01,06)     OK       12      Up
FPC0_T_SG(0,0,6)_FB_D(04,05)  -> SF_1_00_FB_D(01,05)     OK       12      Up
FPC0_T_SG(0,0,7)_FB_D(04,04)  -> SF_1_00_FB_D(01,04)     OK       12      Up
FPC0_B_SG(0,1,0)_FB_D(03,07)  -> SF_1_10_FB_D(00,07)     OK       15      Up
FPC0_B_SG(0,1,1)_FB_D(03,06)  -> SF_1_10_FB_D(00,06)     OK       15      Up
FPC0_B_SG(0,1,2)_FB_D(03,05)  -> SF_1_10_FB_D(00,05)     OK       15      Up
FPC0_B_SG(0,1,3)_FB_D(03,04)  -> SF_1_10_FB_D(00,04)     OK       15      Up
FPC0_B_SG(0,1,4)_FB_D(03,03)  -> SF_1_10_FB_D(00,03)     OK       15      Up
FPC0_B_SG(0,1,5)_FB_D(03,02)  -> SF_1_10_FB_D(00,02)     OK       15      Up
FPC0_B_SG(0,1,6)_FB_D(03,01)  -> SF_1_10_FB_D(00,01)     OK       15      Up
FPC0_B_SG(0,1,7)_FB_D(03,00)  -> SF_1_10_FB_D(00,00)     OK       15      Up
FPC1_T_SG(0,2,0)_FB_D(05,08)  -> SF_1_02_FB_D(02,08)     OK       18      Up
FPC1_T_SG(0,2,1)_FB_D(05,07)  -> SF_1_02_FB_D(02,07)     OK       18      Up
FPC1_T_SG(0,2,2)_FB_D(05,06)  -> SF_1_02_FB_D(02,06)     OK       18      Up
FPC1_T_SG(0,2,3)_FB_D(05,05)  -> SF_1_02_FB_D(02,05)     OK       18      Up
FPC1_T_SG(0,2,4)_FB_D(05,03)  -> SF_1_02_FB_D(02,03)     OK       18      Up
FPC1_T_SG(0,2,5)_FB_D(05,02)  -> SF_1_02_FB_D(02,02)     OK       18      Up
FPC1_T_SG(0,2,6)_FB_D(05,01)  -> SF_1_02_FB_D(02,01)     HIGH     CUR     18
FPC1_T_SG(0,2,7)_FB_D(05,00)  -> SF_1_02_FB_D(02,00)     OK       18      Up
FPC1_B_SG(0,3,0)_FB_D(04,03)  -> SF_1_11_FB_D(01,03)     OK       21      Up
FPC1_B_SG(0,3,1)_FB_D(04,02)  -> SF_1_11_FB_D(01,02)     OK       21      Up
FPC1_B_SG(0,3,2)_FB_D(04,01)  -> SF_1_11_FB_D(01,01)     OK       21      Up
FPC1_B_SG(0,3,3)_FB_D(04,00)  -> SF_1_11_FB_D(01,00)     OK       21      Up
FPC1_B_SG(0,3,4)_FB_D(03,11)  -> SF_1_11_FB_D(00,11)     OK       21      Up
FPC1_B_SG(0,3,5)_FB_D(03,10)  -> SF_1_11_FB_D(00,10)     OK       21      Up
FPC1_B_SG(0,3,6)_FB_D(03,09)  -> SF_1_11_FB_D(00,09)     OK       21      Up
FPC1_B_SG(0,3,7)_FB_D(03,08)  -> SF_1_11_FB_D(00,08)     OK       21      Up
FPC2_T_SG(1,0,0)_FB_C(10,11)  -> SF_1_04_FB_C(07,11)     OK       12      Up
FPC2_T_SG(1,0,1)_FB_C(10,10)  -> SF_1_04_FB_C(07,10)     OK       12      Up
FPC2_T_SG(1,0,2)_FB_C(10,09)  -> SF_1_04_FB_C(07,09)     OK       12      Up
FPC2_T_SG(1,0,3)_FB_C(10,08)  -> SF_1_04_FB_C(07,08)     OK       12      Up
FPC2_T_SG(1,0,4)_FB_C(10,07)  -> SF_1_04_FB_C(07,07)     OK       12      Up
FPC2_T_SG(1,0,5)_FB_C(10,06)  -> SF_1_04_FB_C(07,06)     OK       12      Up
FPC2_T_SG(1,0,6)_FB_C(10,05)  -> SF_1_04_FB_C(07,05)     OK       12      Up
FPC2_T_SG(1,0,7)_FB_C(10,04)  -> SF_1_04_FB_C(07,04)     OK       12      Up
FPC2_B_SG(1,1,0)_FB_C(09,07)  -> SF_1_14_FB_C(06,07)     OK       15      Up
FPC2_B_SG(1,1,1)_FB_C(09,06)  -> SF_1_14_FB_C(06,06)     OK       15      Up
FPC2_B_SG(1,1,2)_FB_C(09,05)  -> SF_1_14_FB_C(06,05)     OK       15      Up
FPC2_B_SG(1,1,3)_FB_C(09,04)  -> SF_1_14_FB_C(06,04)     OK       15      Up
FPC2_B_SG(1,1,4)_FB_C(09,03)  -> SF_1_14_FB_C(06,03)     OK       15      Up
FPC2_B_SG(1,1,5)_FB_C(09,02)  -> SF_1_14_FB_C(06,02)     OK       15      Up
```

```
FPC2_B_SG(1,1,6)_FB_C(09,01)  -> SF_1_14_FB_C(06,01)    OK      15      Up
FPC2_B_SG(1,1,7)_FB_C(09,00)  -> SF_1_14_FB_C(06,00)    OK      15      Up
FPC3_T_SG(1,2,0)_FB_C(11,08)  -> SF_1_06_FB_C(08,08)    OK      18      Up
FPC3_T_SG(1,2,1)_FB_C(11,07)  -> SF_1_06_FB_C(08,07)    OK      18      Up
FPC3_T_SG(1,2,2)_FB_C(11,06)  -> SF_1_06_FB_C(08,06)    OK      18      Up
FPC3_T_SG(1,2,3)_FB_C(11,05)  -> SF_1_06_FB_C(08,05)    OK      18      Up
FPC3_T_SG(1,2,4)_FB_C(11,03)  -> SF_1_06_FB_C(08,03)    OK      18      Up
FPC3_T_SG(1,2,5)_FB_C(11,02)  -> SF_1_06_FB_C(08,02)    OK      18      Up
FPC3_T_SG(1,2,6)_FB_C(11,01)  -> SF_1_06_FB_C(08,01)    OK      18      Up
FPC3_T_SG(1,2,7)_FB_C(11,00)  -> SF_1_06_FB_C(08,00)    OK      18      Up
FPC3_B_SG(1,3,0)_FB_C(10,03)  -> SF_1_15_FB_C(07,03)    OK      21      Up
FPC3_B_SG(1,3,1)_FB_C(10,02)  -> SF_1_15_FB_C(07,02)    OK      21      Up
FPC3_B_SG(1,3,2)_FB_C(10,01)  -> SF_1_15_FB_C(07,01)    HIGH    CUR     21
FPC3_B_SG(1,3,3)_FB_C(10,00)  -> SF_1_15_FB_C(07,00)    OK      21      Up
FPC3_B_SG(1,3,4)_FB_C(09,11)  -> SF_1_15_FB_C(06,11)    OK      21      Up
FPC3_B_SG(1,3,5)_FB_C(09,10)  -> SF_1_15_FB_C(06,10)    OK      21      Up
FPC3_B_SG(1,3,6)_FB_C(09,09)  -> SF_1_15_FB_C(06,09)    OK      21      Up
FPC3_B_SG(1,3,7)_FB_C(09,08)  -> SF_1_15_FB_C(06,08)    OK      21      Up
FPC4_T_SG(2,0,0)_FB_B(16,11)  -> SF_1_01_FB_B(13,11)    OK      12      Up
FPC4_T_SG(2,0,1)_FB_B(16,10)  -> SF_1_01_FB_B(13,10)    OK      12      Up
FPC4_T_SG(2,0,2)_FB_B(16,09)  -> SF_1_01_FB_B(13,09)    OK      12      Up
FPC4_T_SG(2,0,3)_FB_B(16,08)  -> SF_1_01_FB_B(13,08)    OK      12      Up
FPC4_T_SG(2,0,4)_FB_B(16,07)  -> SF_1_01_FB_B(13,07)    OK      12      Up
FPC4_T_SG(2,0,5)_FB_B(16,06)  -> SF_1_01_FB_B(13,06)    OK      12      Up
FPC4_T_SG(2,0,6)_FB_B(16,05)  -> SF_1_01_FB_B(13,05)    OK      12      Up
FPC4_T_SG(2,0,7)_FB_B(16,04)  -> SF_1_01_FB_B(13,04)    OK      12      Up
FPC4_B_SG(2,1,0)_FB_B(15,07)  -> SF_1_08_FB_B(12,07)    OK      15      Up
FPC4_B_SG(2,1,1)_FB_B(15,06)  -> SF_1_08_FB_B(12,06)    OK      15      Up
FPC4_B_SG(2,1,2)_FB_B(15,05)  -> SF_1_08_FB_B(12,05)    OK      15      Up
FPC4_B_SG(2,1,3)_FB_B(15,04)  -> SF_1_08_FB_B(12,04)    OK      15      Up
FPC4_B_SG(2,1,4)_FB_B(15,03)  -> SF_1_08_FB_B(12,03)    OK      15      Up
FPC4_B_SG(2,1,5)_FB_B(15,02)  -> SF_1_08_FB_B(12,02)    OK      15      Up
FPC4_B_SG(2,1,6)_FB_B(15,01)  -> SF_1_08_FB_B(12,01)    OK      15      Up
FPC4_B_SG(2,1,7)_FB_B(15,00)  -> SF_1_08_FB_B(12,00)    OK      15      Up
FPC5_T_SG(2,2,0)_FB_B(17,08)  -> SF_1_03_FB_B(14,08)    OK      18      Up
FPC5_T_SG(2,2,1)_FB_B(17,07)  -> SF_1_03_FB_B(14,07)    OK      18      Up
FPC5_T_SG(2,2,2)_FB_B(17,06)  -> SF_1_03_FB_B(14,06)    OK      18      Up
FPC5_T_SG(2,2,3)_FB_B(17,05)  -> SF_1_03_FB_B(14,05)    OK      18      Up
FPC5_T_SG(2,2,4)_FB_B(17,03)  -> SF_1_03_FB_B(14,03)    OK      18      Up
FPC5_T_SG(2,2,5)_FB_B(17,02)  -> SF_1_03_FB_B(14,02)    OK      18      Up
FPC5_T_SG(2,2,6)_FB_B(17,01)  -> SF_1_03_FB_B(14,01)    OK      18      Up
FPC5_T_SG(2,2,7)_FB_B(17,00)  -> SF_1_03_FB_B(14,00)    OK      18      Up
FPC5_B_SG(2,3,0)_FB_B(16,03)  -> SF_1_09_FB_B(13,03)    OK      21      Up
FPC5_B_SG(2,3,1)_FB_B(16,02)  -> SF_1_09_FB_B(13,02)    OK      21      Up
FPC5_B_SG(2,3,2)_FB_B(16,01)  -> SF_1_09_FB_B(13,01)    OK      21      Up
FPC5_B_SG(2,3,3)_FB_B(16,00)  -> SF_1_09_FB_B(13,00)    OK      21      Up
FPC5_B_SG(2,3,4)_FB_B(15,11)  -> SF_1_09_FB_B(12,11)    OK      21      Up
FPC5_B_SG(2,3,5)_FB_B(15,10)  -> SF_1_09_FB_B(12,10)    OK      21      Up
FPC5_B_SG(2,3,6)_FB_B(15,09)  -> SF_1_09_FB_B(12,09)    OK      21      Up
FPC5_B_SG(2,3,7)_FB_B(15,08)  -> SF_1_09_FB_B(12,08)    OK      21      Up
FPC6_T_SG(3,0,0)_FB_A(22,11)  -> SF_1_05_FB_A(19,11)    OK      12      Up
FPC6_T_SG(3,0,1)_FB_A(22,10)  -> SF_1_05_FB_A(19,10)    OK      12      Up
FPC6_T_SG(3,0,2)_FB_A(22,09)  -> SF_1_05_FB_A(19,09)    OK      12      Up
FPC6_T_SG(3,0,3)_FB_A(22,08)  -> SF_1_05_FB_A(19,08)    OK      12      Up
FPC6_T_SG(3,0,4)_FB_A(22,07)  -> SF_1_05_FB_A(19,07)    OK      12      Up
FPC6_T_SG(3,0,5)_FB_A(22,06)  -> SF_1_05_FB_A(19,06)    OK      12      Up
FPC6_T_SG(3,0,6)_FB_A(22,05)  -> SF_1_05_FB_A(19,05)    OK      12      Up
FPC6_T_SG(3,0,7)_FB_A(22,04)  -> SF_1_05_FB_A(19,04)    OK      12      Up
FPC6_B_SG(3,1,0)_FB_A(21,07)  -> SF_1_12_FB_A(18,07)    OK      15      Up
FPC6_B_SG(3,1,1)_FB_A(21,06)  -> SF_1_12_FB_A(18,06)    OK      15      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_3_00_FB_D(04,11) -> FPC0_T_SG(0,0,0)_FB_D(01,11)      OK       112     Up
SF_3_00_FB_D(04,10) -> FPC0_T_SG(0,0,1)_FB_D(01,10)      OK       112     Up
SF_3_00_FB_D(04,09) -> FPC0_T_SG(0,0,2)_FB_D(01,09)      OK       112     Up
SF_3_00_FB_D(04,08) -> FPC0_T_SG(0,0,3)_FB_D(01,08)      OK       112     Up
SF_3_00_FB_D(04,07) -> FPC0_T_SG(0,0,4)_FB_D(01,07)      OK       112     Up
SF_3_00_FB_D(04,06) -> FPC0_T_SG(0,0,5)_FB_D(01,06)      OK       112     Up
SF_3_00_FB_D(04,05) -> FPC0_T_SG(0,0,6)_FB_D(01,05)      OK       112     Up
SF_3_00_FB_D(04,04) -> FPC0_T_SG(0,0,7)_FB_D(01,04)      OK       112     Up
SF_3_01_FB_B(16,11) -> FPC4_T_SG(2,0,0)_FB_B(13,11)      OK       119     Up
SF_3_01_FB_B(16,10) -> FPC4_T_SG(2,0,1)_FB_B(13,10)      OK       119     Up
SF_3_01_FB_B(16,09) -> FPC4_T_SG(2,0,2)_FB_B(13,09)      OK       119     Up
SF_3_01_FB_B(16,08) -> FPC4_T_SG(2,0,3)_FB_B(13,08)      OK       119     Up
SF_3_01_FB_B(16,07) -> FPC4_T_SG(2,0,4)_FB_B(13,07)      OK       119     Up
SF_3_01_FB_B(16,06) -> FPC4_T_SG(2,0,5)_FB_B(13,06)      OK       119     Up
SF_3_01_FB_B(16,05) -> FPC4_T_SG(2,0,6)_FB_B(13,05)      OK       119     Up
SF_3_01_FB_B(16,04) -> FPC4_T_SG(2,0,7)_FB_B(13,04)      OK       119     Up
SF_3_02_FB_D(05,08) -> FPC1_T_SG(0,2,0)_FB_D(02,08)      OK       126     Up
SF_3_02_FB_D(05,07) -> FPC1_T_SG(0,2,1)_FB_D(02,07)      OK       126     Up
SF_3_02_FB_D(05,06) -> FPC1_T_SG(0,2,2)_FB_D(02,06)      OK       126     Up
SF_3_02_FB_D(05,05) -> FPC1_T_SG(0,2,3)_FB_D(02,05)      OK       126     Up
SF_3_02_FB_D(05,03) -> FPC1_T_SG(0,2,4)_FB_D(02,03)      OK       126     Up
SF_3_02_FB_D(05,02) -> FPC1_T_SG(0,2,5)_FB_D(02,02)      OK       126     Up
SF_3_02_FB_D(05,01) -> FPC1_T_SG(0,2,6)_FB_D(02,01)      OK       126     Up
SF_3_02_FB_D(05,00) -> FPC1_T_SG(0,2,7)_FB_D(02,00)      OK       126     Up
SF_3_03_FB_B(17,08) -> FPC5_T_SG(2,2,0)_FB_B(14,08)      OK       133     Up
SF_3_03_FB_B(17,07) -> FPC5_T_SG(2,2,1)_FB_B(14,07)      OK       133     Up
SF_3_03_FB_B(17,06) -> FPC5_T_SG(2,2,2)_FB_B(14,06)      OK       133     Up
SF_3_03_FB_B(17,05) -> FPC5_T_SG(2,2,3)_FB_B(14,05)      OK       133     Up
SF_3_03_FB_B(17,03) -> FPC5_T_SG(2,2,4)_FB_B(14,03)      OK       133     Up
SF_3_03_FB_B(17,02) -> FPC5_T_SG(2,2,5)_FB_B(14,02)      OK       133     Up
SF_3_03_FB_B(17,01) -> FPC5_T_SG(2,2,6)_FB_B(14,01)      OK       133     Up
SF_3_03_FB_B(17,00) -> FPC5_T_SG(2,2,7)_FB_B(14,00)      OK       133     Up
SF_3_04_FB_C(10,11) -> FPC2_T_SG(1,0,0)_FB_C(07,11)      OK       140     Up
SF_3_04_FB_C(10,10) -> FPC2_T_SG(1,0,1)_FB_C(07,10)      OK       140     Up
SF_3_04_FB_C(10,09) -> FPC2_T_SG(1,0,2)_FB_C(07,09)      OK       140     Up
SF_3_04_FB_C(10,08) -> FPC2_T_SG(1,0,3)_FB_C(07,08)      OK       140     Up
SF_3_04_FB_C(10,07) -> FPC2_T_SG(1,0,4)_FB_C(07,07)      OK       140     Up
SF_3_04_FB_C(10,06) -> FPC2_T_SG(1,0,5)_FB_C(07,06)      OK       140     Up
SF_3_04_FB_C(10,05) -> FPC2_T_SG(1,0,6)_FB_C(07,05)      OK       140     Up
SF_3_04_FB_C(10,04) -> FPC2_T_SG(1,0,7)_FB_C(07,04)      OK       140     Up
SF_3_05_FB_A(22,11) -> FPC6_T_SG(3,0,0)_FB_A(19,11)      OK       147     Up
SF_3_05_FB_A(22,10) -> FPC6_T_SG(3,0,1)_FB_A(19,10)      OK       147     Up
SF_3_05_FB_A(22,09) -> FPC6_T_SG(3,0,2)_FB_A(19,09)      OK       147     Up
SF_3_05_FB_A(22,08) -> FPC6_T_SG(3,0,3)_FB_A(19,08)      OK       147     Up
SF_3_05_FB_A(22,07) -> FPC6_T_SG(3,0,4)_FB_A(19,07)      OK       147     Up
SF_3_05_FB_A(22,06) -> FPC6_T_SG(3,0,5)_FB_A(19,06)      OK       147     Up
SF_3_05_FB_A(22,05) -> FPC6_T_SG(3,0,6)_FB_A(19,05)      HIGH     CUR     147
SF_3_05_FB_A(22,04) -> FPC6_T_SG(3,0,7)_FB_A(19,04)      OK       147     Up
SF_3_06_FB_C(11,08) -> FPC3_T_SG(1,2,0)_FB_C(08,08)      OK       154     Up
```

```
SF_3_06_FB_C(11,07) -> FPC3_T_SG(1,2,1)_FB_C(08,07)      OK       154      Up
SF_3_06_FB_C(11,06) -> FPC3_T_SG(1,2,2)_FB_C(08,06)      OK       154      Up
SF_3_06_FB_C(11,05) -> FPC3_T_SG(1,2,3)_FB_C(08,05)      OK       154      Up
SF_3_06_FB_C(11,03) -> FPC3_T_SG(1,2,4)_FB_C(08,03)      OK       154      Up
SF_3_06_FB_C(11,02) -> FPC3_T_SG(1,2,5)_FB_C(08,02)      OK       154      Up
SF_3_06_FB_C(11,01) -> FPC3_T_SG(1,2,6)_FB_C(08,01)      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_1_00_FB_D(01,11)     OK       12       Up
FPC0_T_SG(0,0,1)_FB_D(04,10)  -> SF_1_00_FB_D(01,10)     OK       12       Up
FPC0_T_SG(0,0,2)_FB_D(04,09)  -> SF_1_00_FB_D(01,09)     OK       12       Up
FPC0_T_SG(0,0,3)_FB_D(04,08)  -> SF_1_00_FB_D(01,08)     OK       12       Up
FPC0_T_SG(0,0,4)_FB_D(04,07)  -> SF_1_00_FB_D(01,07)     OK       12       Up
FPC0_T_SG(0,0,5)_FB_D(04,06)  -> SF_1_00_FB_D(01,06)     OK       12       Up
FPC0_T_SG(0,0,6)_FB_D(04,05)  -> SF_1_00_FB_D(01,05)     OK       12       Up
FPC0_T_SG(0,0,7)_FB_D(04,04)  -> SF_1_00_FB_D(01,04)     OK       12       Up
FPC0_B_SG(0,1,0)_FB_D(03,07)  -> SF_1_10_FB_D(00,07)     OK       15       Up
FPC0_B_SG(0,1,1)_FB_D(03,06)  -> SF_1_10_FB_D(00,06)     OK       15       Up
FPC0_B_SG(0,1,2)_FB_D(03,05)  -> SF_1_10_FB_D(00,05)     OK       15       Up
FPC0_B_SG(0,1,3)_FB_D(03,04)  -> SF_1_10_FB_D(00,04)     OK       15       Up
FPC0_B_SG(0,1,4)_FB_D(03,03)  -> SF_1_10_FB_D(00,03)     OK       15       Up
FPC0_B_SG(0,1,5)_FB_D(03,02)  -> SF_1_10_FB_D(00,02)     OK       15       Up
FPC0_B_SG(0,1,6)_FB_D(03,01)  -> SF_1_10_FB_D(00,01)     OK       15       Up
FPC0_B_SG(0,1,7)_FB_D(03,00)  -> SF_1_10_FB_D(00,00)     OK       15       Up
FPC1_T_SG(0,2,0)_FB_D(05,08)  -> SF_1_02_FB_D(02,08)     OK       18       Up
FPC1_T_SG(0,2,1)_FB_D(05,07)  -> SF_1_02_FB_D(02,07)     OK       18       Up
FPC1_T_SG(0,2,2)_FB_D(05,06)  -> SF_1_02_FB_D(02,06)     OK       18       Up
FPC1_T_SG(0,2,3)_FB_D(05,05)  -> SF_1_02_FB_D(02,05)     OK       18       Up
FPC1_T_SG(0,2,4)_FB_D(05,03)  -> SF_1_02_FB_D(02,03)     OK       18       Up
FPC1_T_SG(0,2,5)_FB_D(05,02)  -> SF_1_02_FB_D(02,02)     OK       18       Up
FPC1_T_SG(0,2,6)_FB_D(05,01)  -> SF_1_02_FB_D(02,01)     HIGH     CUR      18
FPC1_T_SG(0,2,7)_FB_D(05,00)  -> SF_1_02_FB_D(02,00)     OK       18       Up
FPC1_B_SG(0,3,0)_FB_D(04,03)  -> SF_1_11_FB_D(01,03)     OK       21       Up
FPC1_B_SG(0,3,1)_FB_D(04,02)  -> SF_1_11_FB_D(01,02)     OK       21       Up
FPC1_B_SG(0,3,2)_FB_D(04,01)  -> SF_1_11_FB_D(01,01)     OK       21       Up
FPC1_B_SG(0,3,3)_FB_D(04,00)  -> SF_1_11_FB_D(01,00)     OK       21       Up
FPC1_B_SG(0,3,4)_FB_D(03,11)  -> SF_1_11_FB_D(00,11)     OK       21       Up
FPC1_B_SG(0,3,5)_FB_D(03,10)  -> SF_1_11_FB_D(00,10)     OK       21       Up
FPC1_B_SG(0,3,6)_FB_D(03,09)  -> SF_1_11_FB_D(00,09)     OK       21       Up
FPC1_B_SG(0,3,7)_FB_D(03,08)  -> SF_1_11_FB_D(00,08)     OK       21       Up
FPC2_T_SG(1,0,0)_FB_C(10,11)  -> SF_1_04_FB_C(07,11)     OK       12       Up
FPC2_T_SG(1,0,1)_FB_C(10,10)  -> SF_1_04_FB_C(07,10)     OK       12       Up
FPC2_T_SG(1,0,2)_FB_C(10,09)  -> SF_1_04_FB_C(07,09)     OK       12       Up
FPC2_T_SG(1,0,3)_FB_C(10,08)  -> SF_1_04_FB_C(07,08)     OK       12       Up
FPC2_T_SG(1,0,4)_FB_C(10,07)  -> SF_1_04_FB_C(07,07)     OK       12       Up
FPC2_T_SG(1,0,5)_FB_C(10,06)  -> SF_1_04_FB_C(07,06)     OK       12       Up
FPC2_T_SG(1,0,6)_FB_C(10,05)  -> SF_1_04_FB_C(07,05)     OK       12       Up
FPC2_T_SG(1,0,7)_FB_C(10,04)  -> SF_1_04_FB_C(07,04)     OK       12       Up
FPC2_B_SG(1,1,0)_FB_C(09,07)  -> SF_1_14_FB_C(06,07)     OK       15       Up
```

```
FPC2_B_SG(1,1,1)_FB_C(09,06)  -> SF_1_14_FB_C(06,06)     OK        15       Up
FPC2_B_SG(1,1,2)_FB_C(09,05)  -> SF_1_14_FB_C(06,05)     OK        15       Up
FPC2_B_SG(1,1,3)_FB_C(09,04)  -> SF_1_14_FB_C(06,04)     OK        15       Up
FPC2_B_SG(1,1,4)_FB_C(09,03)  -> SF_1_14_FB_C(06,03)     OK        15       Up
FPC2_B_SG(1,1,5)_FB_C(09,02)  -> SF_1_14_FB_C(06,02)     OK        15       Up
FPC2_B_SG(1,1,6)_FB_C(09,01)  -> SF_1_14_FB_C(06,01)     OK        15       Up
FPC2_B_SG(1,1,7)_FB_C(09,00)  -> SF_1_14_FB_C(06,00)     OK        15       Up
FPC3_T_SG(1,2,0)_FB_C(11,08)  -> SF_1_06_FB_C(08,08)     OK        18       Up
FPC3_T_SG(1,2,1)_FB_C(11,07)  -> SF_1_06_FB_C(08,07)     OK        18       Up
FPC3_T_SG(1,2,2)_FB_C(11,06)  -> SF_1_06_FB_C(08,06)     OK        18       Up
FPC3_T_SG(1,2,3)_FB_C(11,05)  -> SF_1_06_FB_C(08,05)     OK        18       Up
FPC3_T_SG(1,2,4)_FB_C(11,03)  -> SF_1_06_FB_C(08,03)     OK        18       Up
FPC3_T_SG(1,2,5)_FB_C(11,02)  -> SF_1_06_FB_C(08,02)     OK        18       Up
FPC3_T_SG(1,2,6)_FB_C(11,01)  -> SF_1_06_FB_C(08,01)     OK        18       Up
...
```

## show chassis feb

**Syntax** show chassis feb

**Release Information** Command introduced before Junos OS Release 7.4.

**Description** (M5, M10, and M120 routers only) Display Forwarding Engine Board (FEB) status information.

**Options** This command has no options.

**Required Privilege Level** view

**List of Sample Output** 
show chassis feb (M10 Router) on page 436
show chassis feb (M120 Router) on page 436
show chassis feb detail (M120 Router) on page 436

**Output Fields** Table 45 on page 435 lists the output fields for the **show chassis feb** command. Output fields are listed in the approximate order in which they appear.

### Table 45: show chassis feb

| Field Name | Field Description |
|---|---|
| **State** | State of the FEB:<br>• **Offline**—FEB is powered down.<br>• **Online**—FEB is operational and running.<br>• **Check**—FEB is in alarmed state where the Switch Interface Board (SIB) plane is partially operational for the following reasons:<br>  • FEB is not inserted properly.<br>  • 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. |
| **CPU Utilization (%)** | Percentage of CPU being used:<br>• **Total**—Total percentage of CPU being used by the FEB processor.<br>• **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:<br>• **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).<br>• **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. |

### Table 45: show chassis feb *(continued)*

| Field Name | Field Description |
|---|---|
| **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 firmware

**Syntax**

show chassis firmware

**Syntax (TX Matrix Router)**

show chassis firmware
<lcc *number* | scc>

**Syntax (TX Matrix Plus Router)**

show chassis firmware
<lcc *number* | sfc *number*>

**Syntax (MX Series Router)**

show chassis firmware
<all-members>
<local>
<member *member-id*>

**Syntax (QFX Series)**

show chassis firmware
interconnect-device *name*
node-device *name*

**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 the QFX Series.

**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 switches) (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 switches 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**.

**Required Privilege Level**

view

**List of Sample Output**

show chassis firmware (M10 Router) on page 440
show chassis firmware (M20 Router) on page 440
show chassis firmware (M40 Router) on page 440
show chassis firmware (M120 Router) on page 440
show chassis firmware (M160 Router) on page 440
show chassis firmware (MX240 Router) on page 441
show chassis firmware (MX480 Router) on page 441
show chassis firmware (MX960 Router) on page 441
show chassis firmware (EX4200 Switch) on page 441
show chassis firmware (EX8200 Switch) on page 441
show chassis firmware lcc (TX Matrix Router) on page 441
show chassis firmware scc (TX Matrix Router) on page 442
show chassis firmware (TX Matrix Plus Router) on page 442
show chassis firmware lcc (TX Matrix Plus Router) on page 443
show chassis firmware sfc (TX Matrix Plus Router) on page 443
show chassis firmware (QFX Series) on page 444
show chassis firmware interconnect-device (QFabric Switch) on page 444

**Output Fields**

Table 46 on page 440 lists the output fields for the **show chassis firmware** command. Output fields are listed in the approximate order in which they appear.

### Table 46: show chassis firmware Output Fields

| Field Name | Field Description |
|---|---|
| **Part** | Chassis part name. |
| **Type** | Type of firmware: On routers: **ROM** or **O/S.** On switches: **uboot** or **loader**. |
| **Version** | Version of firmware running on the chassis part. |

## 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 (EX4200 Switch)**

```
user@host> 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@host> 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 Switch)**

```
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 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

**List of Sample Output** show chassis forwarding on page 445

**Output Fields** Table 47 on page 445 lists the output fields for the **show chassis forwarding** command. Output fields are listed in the approximate order in which they appear.

### Table 47: show chassis forwarding Output Fields

| Field Name | Field Description |
| --- | --- |
| **FWWD status** | Forwarding status:<br>• **State**:<br>  ◦ **Online**—FWDD is operational and running.<br>  ◦ **Offline**—FWDD is not running.<br>• **Microkernel CPU utilization**—Percentage of microkernel CPU being used by the forwarding process.<br>• **Real-time threads CPU utilization**—Percentage of CPU being used by the forwarding process.<br>• **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).<br>• **Buffer utilization**—Percentage of buffer space being used by the forwarding process for buffering internal messages.<br>• **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 (TX Matrix and TX Matrix Plus Router)**

show chassis fpc
<detail <*fpc-slot*>> | <pic-status <*fpc-slot*>>
<*slot*>

**Syntax (MX Series Router)**

show chassis fpc
<detail <*slot*>> | <pic-status <*slot*>>
<all-members>
<local>
<member *member-id*>

**Syntax (QFX Series)**

show chassis fpc
<detail>
<interconnect-device *name* <fpc-slot *fpc-slot*>>
<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.
Command introduced in Junos OS Release 11.1 for the QFX Series.

**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.

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 switches only) (Optional) Display status information for all FPCs on the Interconnect device.

*fpc-slot*—(Optional) FPC slot number:

- (TX Matrix and TX Matrix Plus router only—On a TX Matrix router, if you specify the number of the T640 router (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**.
- 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** (switch's member ID).
  - EX6210 switches—Replace ***fpc-slot*** with a value from **0** through **3** (line card), **4** or **5** (Switch Fabric and Routing Engine (SRE) module), or **6** through **9** (line card).
  - EX8208 switches—Replace ***fpc-slot*** with a value from **0** through **7** (line card).
  - EX8216 switches—Replace ***fpc-slot*** with a value from **0** through **15** (line card).
- QFX Series:
  - QFX3500 switches—Replace ***fpc-slot*** with 0.
  - QFabric switches—Replace ***fpc-slot*** with 0 through 31 on the Interconnect device.

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 switches only) (Optional) Display status information for each Node device. Each Node device is equivalent to an FPC.

pic-status—(Optional) Display status information for all PICs or for the PIC in the specified slot (see ***fpc-slot***).

NOTE: On T1600 routers, Type 4 FPCs with ASICs based on the SL2.0 chipset do not support the 10-Gigabit Ethernet LAN/WAN PIC with SFP+ (10x10GE [LAN/WAN] SFPP). If you issue the **show chassis fpc** command with the **pic-status** option, the CLI displays the string "Not Supported" for 10x10GE(LAN/WAN) SFPP PICs installed on such FPCs. The following is a sample output:

```
user@host> show chassis fpc pic-status
Slot 0   Online        E2-FPC Type 1
  PIC 0  Online        1x G/E SFP, 1000 BASE
  PIC 1  Online        Adaptive Services-II
  PIC 2  Online        1x G/E IQ, 1000 BASE
  PIC 3  Online        1x G/E IQ, 1000 BASE
Slot 1   Online        FPC Type 3-ES
  PIC 0  Present       UNUSED- Not Supported
Slot 2   Online        FPC Type 4-ES
  PIC 0  Offline       4x OC-192 SONET XFP
  PIC 1  Present       10x10GE(LAN/WAN) SFPP- Not Supported
<<<<<<
Slot 4   Offline       FPC Type 1-ES
Slot 5   Offline       FPC Type 2-ES
Slot 6   Online        E2-FPC Type 3
  PIC 0  Online        1x OC-192 SONET XFP
  PIC 1  Online        4x OC-48 SONET
  PIC 2  Online        4x OC-48 SONET
  PIC 3  Online        MultiServices 500
Slot 7   Online        FPC Type 4-ES
  PIC 0  Online        4x 10GE (LAN/WAN) XFP
  PIC 1  Online        4x 10GE (LAN/WAN) XFP
```

In addition, an entry is logged in the system log messages (/var/log/messages) that the PIC is not supported. The following is a sample message logged in the system log:

```
Apr  5 08:47:36  router1 chassisd[2770]: CHASSISD_UNSUPPORTED_PIC:
 PIC 1 in FPC 2 (type 763, version 257) is not supported
```

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 192

**List of Sample Output**

show chassis fpc (EX6210 Switch) on page 450
show chassis fpc (M10 Router) on page 451
show chassis fpc (M20 Router) on page 451
show chassis fpc detail (M Series Routers) on page 451

**Output Fields** Table 48 on page 449 lists the output fields for the **show chassis fpc** command. Output fields are listed in the approximate order in which they appear.

## Table 48: 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:<br>• **Dead**—Held in reset because of errors.<br>• **Diag**—Slot is being ignored while the FPC is running diagnostics.<br>• **Dormant**—Held in reset.<br>• **Empty**—No FPC is present.<br>• **Online**—FPC is online and running.<br>• **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.<br>• **Probed**—Probe is complete; awaiting restart of the Packet Forwarding Engine (PFE).<br>• **Probe-wait**—Waiting to be probed. | all levels |

## Table 48: show chassis fpc Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|---|---|---|
| **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 |
| **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). | none specified |
| **Buffer Utilization (%)** | Percentage of buffer space being used by the FPC's processor for buffering internal messages. | none specified |
| **Total CPU DRAM** | Amount of DRAM available to the FPC's CPU. | **detail** |
| **Total RLDRAM** | Amount of reduced latency dynamic random access memory (RLDRAM) available to the FPC CPU. | **detail** |
| **Total DDR DRAM** | Amount of double data rate dynamic random access memory (DDR DRAM) available to the FPC CPU. | **detail** |
| **Total SRAM** | Amount of static RAM (SRAM) used by the FPC's CPU. | **detail** |
| **Total SDRAM** | Total amount of memory used for storing packets and notifications. | **detail** |
| **I/O Manager ASICs information** | I/O Manager version number, manufacturer, and part number. | **detail** |
| **Start time** | Time when the Routing Engine detected that the FPC was running. | **detail** |
| **Uptime** | How long the Routing Engine has been connected to the FPC and, therefore, how long the FPC has been up and running. | **detail** |
| **PIC type** | (**pic-status** output only) Type of PIC. | none specified |

## Sample Output

**show chassis fpc (EX6210 Switch)**

```
user@switch> show chassis fpc
                     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 Mbytes
  Total SRAM                       4 Mbytes
  Total SDRAM                    256 Mbytes
  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 (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 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 (Hardware Not Supported)**

```
user@host> show chassis fpc
show chassis fpc
                     Temp  CPU Utilization (%)   Memory    Utilization (%)
 Slot State           (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
  0  Online          -------------------- CPU less FPC --------------------
  1  Present         ------ Hardware Not In Right Slot ------
  2  Online                 0          0         0         0          0
  3  Present         ------ Hardware Not Supported ------
  4  Empty
  5  Empty
  6  Online                 0          0         0         0          0
```

**show chassis fpc detail (Hardware Not Supported)**

```
user@host> show chassis fpc detail
Slot 0 information:
  State                             Online
  Total CPU DRAM                    ---- CPU less FPC ----
  Start time                        2006-07-07 03:21:00 UTC
  Uptime                            27 minutes, 51 seconds
 Slot 1 information:
  State                             Present
```

```
 Reason                             --- Hardware Not In Right Slot ---
Slot 2 information:
 State                              Online
 Total CPU DRAM                  32 MB
 Start time                         2006-07-07 03:20:59 UTC
 Uptime                             27 minutes, 52 seconds
Slot 3 information:
 State                              Present
 Reason                             --- Hardware Not Supported ---
 Total CPU DRAM                   0 MB
Slot 6 information:
 State                              Online
 Total CPU DRAM                  32 MB
 Start time                         2006-07-07 03:21:01 UTC
 Uptime                             27 minutes, 50 seconds
```

**show chassis fpc pic-status**

```
user@host> show chassis fpc pic-status
Slot 0 Online
  PIC 1    1x OC-12 ATM, MM
  PIC 2    1x OC-12 ATM, MM
  PIC 3    1x OC-12 ATM, MM
Slot 1 Online
  PIC 0    1x OC-48 SONET, SMIR
Slot 2 Online
  PIC 0    1x OC-192 SONET, SMSR
```

**show chassis fpc pic-status (M Series Routers)**

```
user@host> show chassis fpc pic-status
Slot 1   Online       FPC Type 1
  PIC 0  Present      2x OC-3 ATM, MM- Hardware Error
  PIC 1  Online       4x OC-3 SONET, SMIR
Slot 2   Online       E-FPC Type 2
  PIC 0  Online       4x G/E, 1000 BASE-SX
  PIC 1  Online       2x G/E SFP, 1000 BASE
  PIC 3  Online       1x Tunnel
Slot 3   Online       E-FPC Type 1
  PIC 0  Online       1x G/E IQ, 1000 BASE
  PIC 2  Online       1x G/E SFP, 1000 BASE
Slot 4   Online       E-FPC Type 2
  PIC 0  Online       4x G/E SFP, 1000 BASE
  PIC 1  Online       4x G/E SFP, 1000 BASE
  PIC 2  Online       4x G/E SFP, 1000 BASE
  PIC 3  Online       4x G/E SFP, 1000 BASE
Slot 5   Online       FPC Type 2
...
```

**show chassis fpc pic-status (M120 Router)**

```
user@host> show chassis fpc pic-status
Slot 1   Online       M120 CFPC 10GE
  PIC 0  Online       1x 10GE(LAN/WAN) XFP
Slot 3   Online       M120 FPC Type 2 (proto)
  PIC 0  Online       2x G/E IQ, 1000 BASE
  PIC 1  Online       4x OC-3 SONET, SMIR
  PIC 2  Online       2x G/E IQ, 1000 BASE
  PIC 3  Online       8x 1GE(LAN), IQ2
Slot 4   Online       M120 FPC Type 3 (proto)
  PIC 0  Online       10x 1GE(LAN), 1000 BASE
Slot 5   Online       M120 FPC Type 1 (proto)
  PIC 0  Present      1x G/E, 1000 BASE-LX- Not Supported
  PIC 1  Online       1x CHOC3 IQ SONET, SMLR
```

```
  PIC 2  Online       4x CHDS3 IQ
  PIC 3  Online       1x G/E SFP, 1000 BASE
```

**show chassis fpc 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 (QFX Series)

```
user@switch> show chassis fpc
Temp  CPU Utilization (%)   Memory    Utilization (%)
Slot State           (C)  Total  Interrupt      DRAM (MB) Heap     Buffer
0  Online           26      2          0       2820        0        49
```

### show chassis fpc detail (QFX3500 Switches)

```
user@switch> show chassis fpc detail
Slot 0 information:
  State                               Online
  Temperature                      28 degrees C / 82 degrees F
  Total CPU DRAM                 2820 MB
  Total SRAM                        0 MB
  Total SDRAM                       0 MB
  Start time                          2010-09-20 01:34:13 PDT
  Uptime                              3 days, 3 hours, 31 minutes, 48 seconds
```

### show chassis fpc pic-status (QFX3500 Switches)

```
user@switch> show chassis fpc pic-status
Slot 0   Online      QFX 48x10G 4x40G Switch
  PIC 0  Online      48x 10G-SFP+
  PIC 1  Online      15x 10G-SFP+
```

### show chassis fpc interconnect-device (QFabric Switch)

```
user@switch> show chassis fpc interconnect-device interconnect1
FPC status:
                     Temp
Slot State            (C)
  0  Online             0
  1  Online             0
  2  Online             0
  3  Online             0
  4  Online             0
  5  Online             0
  6  Online             0
  7  Online             0
  8  Online             0
  9  Online             0
 10  Online             0
 11  Online             0
 12  Online             0
 13  Online             0
 14  Online             0
 15  Online             0
```

### show chassis fpc interconnect-device (QFabric Switch)

```
user@switch> show chassis fpc interconnect-device interconnect1 3
FPC status:
                     Temp
Slot State            (C)
  3  Online             0
```

**show chassis fpc interconnect-device detail (QFabric Switch)**

```
user@switch> show chassis fpc interconnect-device interconnect1 3 detail
Slot 3 information:
  State                              Online
  Temperature                     0 degrees C / 32 degrees F
  Start time                         2011-08-18 10:45:04 PDT
  Uptime                             1 minute, 49 seconds
```

**show chassis fpc pic-status interconnect-device (QFabric Switch)**

```
user@switch> show chassis fpc pic-status interconnect-device interconnect1
Slot 0   Online       QFX 16-port QSFP+ Front Card
  PIC 0  Online       16x 40G-QSFP+
  PIC 1  Online       16x 40G-GE
Slot 1   Online       QFX 16-port QSFP+ Front Card
  PIC 0  Online       16x 40G-QSFP+
 PIC 1  Online       16x 40G-GE
Slot 2   Online       QFX 16-port QSFP+ Front Card
  PIC 0  Online       16x 40G-QSFP+
  PIC 1  Online       16x 40G-GE
Slot 3   Online       QFX 16-port QSFP+ Front Card
  PIC 0  Online       16x 40G-QSFP+
  PIC 1  Online       16x 40G-GE
Slot 4   Online       QFX 16-port QSFP+ Front Card
  PIC 0  Online       16x 40G-QSFP+
  PIC 1  Online       16x 40G-GE
Slot 5   Online       QFX 16-port QSFP+ Front Card
  PIC 0  Online       16x 40G-QSFP+
  PIC 1  Online       16x 40G-GE
Slot 6   Online       QFX 16-port QSFP+ Front Card
  PIC 0  Online       16x 40G-QSFP+
  PIC 1  Online       16x 40G-GE
Slot 7   Online       QFX 16-port QSFP+ Front Card
  PIC 0  Online       16x 40G-QSFP+
  PIC 1  Online       16x 40G-GE
Slot 8   Online       QFX Fabric Rear Card
  PIC 0  Online       16x 40G-GE
Slot 9   Online       QFX Fabric Rear Card
  PIC 0  Online       16x 40G-GE
Slot 10  Online       QFX Fabric Rear Card
  PIC 0  Online       16x 40G-GE
Slot 11  Online       QFX Fabric Rear Card
  PIC 0  Online       16x 40G-GE
Slot 12  Online       QFX Fabric Rear Card
  PIC 0  Online       16x 40G-GE
Slot 13  Online       QFX Fabric Rear Card
  PIC 0  Online       16x 40G-GE
Slot 14  Online       QFX Fabric Rear Card
  PIC 0  Online       16x 40G-GE
Slot 15  Online       QFX Fabric Rear Card
  PIC 0  Online       16x 40G-GE
```

**show chassis fpc pic-status node-device (QFabric Switch)**

```
user@switch> show chassis fpc pic-status node-device node1
Slot node1 Online      QFX 48x10G 4x40G Switch
  PIC 0  Online       48x 10G-SFP+
  PIC 1  Online       4x 40G-QSFP+
```

## show chassis fpc-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

**List of Sample Output** show chassis fpc-feb-connectivity on page 463

**Output Fields** Table 49 on page 462 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 49: 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:<br>• **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.<br>• **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.<br>• **Empty**—No FPC is present.<br>• **Offline**—FPC is powered down.<br>• **Online**—FPC is online and running.<br>• **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.<br>• **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 49: 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:<br>• **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.<br>• **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.<br>• **Empty**—No FEB is present.<br>• **Offline**—FEB is powered down.<br>• **Online**—FEB is online and running.<br>• **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.<br>• **Ready**—FEB is in transition state. |
| **Link status** | Status of the link connecting the R-FEB and R-FPC:<br>• **Error**<br>• **Misconfiguration**—Configuration between the R-FEB and the F-FPC is incorrect.<br>• **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 (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 Router)**

show chassis hardware
<detail | extensive>
<clei-models>
<models>
<all-members>
<local>
<member *member-id*>

**Syntax (QFX Series)**

show chassis hardware
<detail | extensive>
<clei-models>
<interconnect-device *name*>
<node-device *name*>
<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 the QFX Series.

**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 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 stand-alone switch, Both the FPC and FPC ***number*** are always **0**.

**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) bar code 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 switches 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 switches 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 50: 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

**List of Sample Output**

show chassis hardware (EX8216 Switch) on page 470
show chassis hardware clei-models (EX8216 Switch) on page 471
show chassis hardware clei-models (T1600 Router) on page 471
show chassis hardware detail (EX4200 Switch) on page 472
show chassis hardware models (EX4500 Switch) on page 472
show chassis hardware (J6350 Router) on page 472
show chassis hardware (J6300 Router) on page 473
show chassis hardware (M7i Router) on page 473
show chassis hardware (M10 Router) on page 474
show chassis hardware models (M10 Router) on page 474
show chassis hardware (M20 Router) on page 474
show chassis hardware models (M20 Router) on page 475
show chassis hardware (M40 Router) on page 475
show chassis hardware (M40e Router) on page 476
show chassis hardware (M120 Router) on page 476
show chassis hardware detail (M120 Router) on page 477
show chassis hardware models (M120 Router) on page 478
show chassis hardware (M160 Router) on page 479
show chassis hardware models (M160 Router) on page 479
show chassis hardware detail (M160 Router) on page 480
show chassis hardware (M320 Router) on page 481
show chassis hardware models (M320 Router) on page 482
show chassis hardware (MX5 Router) on page 482
show chassis hardware (MX10 Router) on page 483
show chassis hardware (MX40 Router) on page 483
show chassis hardware (Fixed MX80 Router) on page 484
show chassis hardware (Modular MX80 Router) on page 484
show chassis hardware (MX240 Router) on page 485
show chassis hardware detail (MX 240 Router with Routing Engine Displaying DIMM information) on page 486
show chassis hardware (MX240 Router with Enhanced MX SCB) on page 486
show chassis hardware (MX480 Router) on page 487
show chassis hardware (MX480 Router with Enhanced MX SCB) on page 487
show chassis hardware (MX960 Router) on page 488
show chassis hardware (MX960 Router with Bidirectional Optics) on page 488
show chassis hardware (MX960 Router with Enhanced MX SCB) on page 489
show chassis hardware models (MX960 Router with Enhanced MX SCB) on page 491
show chassis hardware detail (MX960 Router) on page 491
show chassis hardware (T320 Router) on page 491

show chassis hardware (T640 Router) on page 493
show chassis hardware models (T640 Router) on page 493
show chassis hardware extensive (T640 Router) on page 494
show chassis hardware lcc (TX Matrix Router) on page 494
show chassis hardware scc (TX Matrix Router) on page 495
show chassis hardware (T1600 Router) on page 495
show chassis hardware (TX Matrix Plus Router) on page 498
show chassis hardware sfc (TX Matrix Plus Router) on page 503
show chassis hardware extensive (TX Matrix Plus Router) on page 504
show chassis hardware clei-models (TX Matrix Plus Router) on page 505
show chassis hardware detail (TX Matrix Plus Router) on page 507
show chassis hardware models (TX Matrix Plus Router) on page 509
show chassis hardware (16-Port 10-Gigabit Ethernet MPC with SFP+ Optics [MX Series Routers]) on page 512
show chassis hardware (QFX3500 Switches) on page 512
show chassis hardware detail (QFX3500 Switches) on page 513
show chassis hardware models (QFX3500 Switches) on page 514
show chassis hardware clei-models (QFX3500 Switches) on page 514
show chassis hardware interconnect-device (QFabric Switches) on page 514
show chassis hardware node-device (QFabric Switches) on page 514

**Output Fields** Table 51 on page 468 lists the output fields for the **show chassis hardware** command. Output fields are listed in the approximate order in which they appear.

### Table 51: show chassis hardware Output Fields

| Field Name | Field Description | Level of Output |
|---|---|---|
| **Item** | Chassis component:<br>• (EX Series switches)—Information about the chassis, Routing Engine (SRE and RE 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 .<br>• (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 (PFE) that attaches directly to MICs. The PFE has two “pseudo” FPCs (FPC 0 and FPC1). MX80 routers also have a Forwarding Engine Board (FEB).<br>• (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.<br>• (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.<br>• (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). | 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 or switch 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** |
| **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 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 |

Table 51: show chassis hardware Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|---|---|---|
| **EEPROM Version** | ID EEPROM version used by hardware component: **0x00** (version 0), **0x01** (version 1), or **0x02** (version 2). | **extensive** |
| **Description** | Brief description of the hardware item:<br>• Type of power supply.<br>• Type of PIC. If the PIC type is not supported on the current software release, the output states **Hardware Not Supported**.<br>• Type of FPC: **FPC Type 1**, **FPC Type 2**, **FPC Type 3**, **FPC Type 4** , or **FPC Type OC192**.<br>On EX Series switches, a brief description of the FPC.<br>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.<br>◦ **2x FE**—Either two built-in Fast Ethernet interfaces (fixed PIM) or dual-port Fast Ethernet PIM<br>◦ **4x FE**—4-port Fast Ethernet ePIM<br>◦ **1x GE Copper**—Copper Gigabit Ethernet ePIM (one 10-Mbps, 100-Mbps, or 1000-Mbps port)<br>◦ **1x GE SFP**—SFP Gigabit Ethernet ePIM (one fiber port)<br>◦ **4x GE Base PIC**—Four built-in Gigabit Ethernet ports on a J4350 or J6350 chassis (fixed PIM)<br>◦ **2x Serial**—Dual-port serial PIM<br>◦ **2x T1**—Dual-port T1 PIM<br>◦ **2x E1**—Dual-port E1 PIM<br>◦ **2x CT1E1**—Dual-port channelized T1/E1 PIM<br>◦ **1x T3**—T3 PIM (one port)<br>◦ **1x E3**—E3 PIM (one port)<br>◦ **4x BRI S/T**—4-port ISDN BRI S/T PIM<br>◦ **4x BRI U**—4-port ISDN BRI U PIM<br>◦ **1x ADSL Annex A**—ADSL 2/2+ Annex A PIM (one port, for POTS)<br>◦ **1x ADSL Annex B**—ADSL 2/2+ Annex B PIM (one port, for ISDN)<br>◦ **2x SHDSL (ATM)**—G SHDSL PIM (2-port two-wire module or 1-port four-wire module)<br>◦ **1x TGM550**—TGM550 Telephony Gateway Module (Avaya VoIP Gateway Module with one console port, two analog **LINE** ports, and two analog **TRUNK** ports)<br>◦ **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)<br>◦ **4x FXS, 4xFXO, TIM514**—TIM514 Analog Telephony Interface Module (Avaya VoIP media module with four analog **LINE** ports and four analog **TRUNK** ports)<br>◦ **4x BRI TIM521**—TIM521 BRI Telephony Interface Module (Avaya VoIP media module with four ISDN BRI ports)<br>◦ **Crypto Accelerator Module**—For enhanced performance of cryptographic algorithms used in IP Security (IPsec) services | All levels |

## Table 51: show chassis hardware Output Fields *(continued)*

| Field Name | Field Description | Level of Output |
|---|---|---|
| | • **MPC M 16x 10GE**—16-port 10-Gigabit Module Port Concentrator that supports SFP+ optical transceivers. (Not on EX Series switches.)<br>• For hosts, the Routing Engine type.<br>• For small form-factor pluggable transceiver (SFP) modules, the type of fiber: **LX**, **SX**, **LH**, or **T**.<br>• LCD description for EX Series switches (except EX2200 switches). | |

## 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-1OC192-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           UNKNOWN
    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       UNKNOWN
Fan Tray                                                 Rear Fan Tray
```

**show chassis hardware (M10 Router)**

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                1122              M10
Midplane         REV 1.1  710-001950   S/N AC6626
Power supply A   Rev 01   740-002497   S/N LC36095       AC
Power supply B   Rev 01   740-002497   S/N LC36100       AC
Display          REV 1.2  710-001995   S/N AC6656
Host                                   18000005dfb3fb01  teknor
FEB              REV 01   710-001948   S/N AC6632        Internet Processor II
FPC 0
  PIC 0          REV 08   750-001072   S/N AB2485        1x G/E, 1000 BASE-SX
  PIC 1          REV 01   750-000613   S/N AA1048        1x OC-12 SONET, SMIR
FPC 1
Fan Tray 0                                               FANTRAY-M10I-S
Fan Tray 1                                               FANTRAY-M10I-S
```

**show chassis hardware models (M10 Router)**

```
user@host> show chassis hardware models
Hardware inventory:
Item             Version  Part number  CLEI code         FRU model number
Midplane         REV 04   710-008920                     CHAS-MP-M10i-S
Power Supply 0   Rev 06   740-008537                     PWR-M10i-M7i-AC-S
Power Supply 1   Rev 06   740-008537                     PWR-M10i-M7i-AC-S
HCM 0            REV 03   710-010580                     HCM-M10i-S
HCM 1            REV 03   710-010580                     HCM-M10i-S
Routing Engine 0 REV 09   740-009459                     RE-400-256-S
CFEB 0           REV 05   750-010465                     FEB-M10i-M7i-S
FPC 0
  PIC 0          REV 10   750-002971                     PE-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 Mbytes
  SSRAM bank 1   REV 01   710-001385   S00490            2 Mbytes
  SSRAM bank 2   REV 01   710-001385   S001:?            2 Mbytes
  SSRAM bank 3   REV 01   710-001385   S00483            2 Mbytes
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 Mbyte
  SDRAM bank 0   REV 01   710-000099   S/N 000603        64 Mbytes
  SDRAM bank 1   REV 01   710-000099   S/N 000414        64 Mbytes
  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 Mbyte
  SDRAM bank 0   REV 01   710-000099   S/N 306835        64 Mbytes
  SDRAM bank 1   REV 01   710-000099   S/N 306832        64 Mbytes
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 Mbyte
  SSRAM bank 1   REV 02   710-000077   S/N AA2270        1 Mbyte
  SSRAM bank 2   REV 02   710-000077   S/N AA2269        1 Mbyte
  SSRAM bank 3   REV 02   710-000077   S/N AA2268        1 Mbyte
FPC 0            REV 01   710-000175   S/N AA0048
  SSRAM          REV 01   710-000077   S/N AA2333        1 Mbyte
  SDRAM bank 0   REV 01   710-000099   S/N AA2332        64 Mbytes
  SDRAM bank 1   REV X1   710-000099   S/N AA2337        64 Mbytes
  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 Mbyte
```

```
  SDRAM bank 0   REV 01   710-000099   S/N AA2331        64 Mbytes
  SDRAM bank 1   REV 01   710-000099   S/N AA2330        64 Mbytes
  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 Mbyte
  SDRAM bank 0   REV 01   710-000099   S/N AA2329        64 Mbytes
  SDRAM bank 1   REV 01   710-000099   S/N AA2328        64 Mbytes
  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 Mbyte
  SDRAM bank 0   REV 01   710-000099   S/N 300949        64 Mbytes
  SDRAM bank 1   REV 01   710-000099   S/N 300868        64 Mbytes
  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 Mbyte
  SSRAM bank 1  REV 01   710-000077   S/N 306474        1 Mbyte
  SSRAM bank 2  REV 01   710-000077   S/N 306388        1 Mbyte
  SSRAM bank 3  REV 01   710-000077   S/N 306392        1 Mbyte
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 Mbyte
  SSRAM bank 1  REV 01   710-000077   S/N 302662        1 Mbyte
  SSRAM bank 2  REV 01   710-000077   S/N 302593        1 Mbyte
  SSRAM bank 3  REV 01   710-000077   S/N 100160        1 Mbyte
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 Mbyte
  SDRAM 0       REV 01   710-001196   S00141            32 Mbytes
  SDRAM 1       REV 01   710-001196   S0010;            32 Mbytes
  SSRAM         REV 01   710-000077   S/N 302633        1 Mbyte
  SDRAM 0       REV 01   710-001196   S00143            32 Mbytes
  SDRAM 1       REV 01   710-001196   S00115            32 Mbytes
```

```
  SSRAM          REV 01   710-000077   S/N 302952        1 Mbyte
  SDRAM 0        REV 01   710-001196   S00135            32 Mbytes
  SDRAM 1        REV 01   710-001196   S001=3            32 Mbytes
  SSRAM          REV 01   710-000077   S/N 302892        1 Mbyte
  SDRAM 0        REV 01   710-001196   S000?6            32 Mbytes
  SDRAM 1        REV 01   710-001196   S001=5            32 Mbytes
  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 Mbyte
  SDRAM 0        REV 01   710-001196   S00012            32 Mbytes
  SDRAM 1        REV 01   710-001196   S0001?            32 Mbytes
  SSRAM          REV 01   710-000077   S/N 306454        1 Mbyte
  SDRAM 0        REV 01   710-001196   S00028            32 Mbytes
  SDRAM 1        REV 01   710-001196   S0002?            32 Mbytes
  SSRAM          REV 01   710-000077   S/N 306492        1 Mbyte
  SDRAM 0        REV 01   710-001196   S00015            32 Mbytes
  SDRAM 1        REV 01   710-001196   S00031            32 Mbytes
  SSRAM          REV 01   710-000077   S/N 306363        1 Mbyte
  SDRAM 0        REV 01   710-001196   S00013            32 Mbytes
  SDRAM 1        REV 01   710-001196   S00032            32 Mbytes
  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 Mbyte
```

**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 Displaying DIMM information)**

```
user@host> show chassis hardware detail

Item             Version  Part number  Serial number     Description
Chassis                                JN11279B4AFC      MX240 Backplane
Midplane         REV 07   760-021404   TS2474            MX240 Backplane
FPM Board        REV 03   760-021392   XC2643            Front Panel Display
PEM 0            Rev 03   740-017343   QCS0908A068       DC Power Entry Module
Routing Engine 0 REV 01   740-031117   AARCH00           RE-S-1800x4
  ad0    3764 MB  STEC M2+ CF 9.0.2    STIM2Q3209239145303 Removable Compact Flash

  ad1   28626 MB  WDC SSD-F0030S-5000  C933Z036237215548S00 Compact Flash
  usb0 (addr 1)  EHCI root hub 0       Intel             uhub0
  usb0 (addr 2)  product 0x0020 32     vendor 0x8087     uhub1
  DIMM 0         VL31B5263E-F8S DIE REV-0 PCB REV-0      MFR ID-ce80
  DIMM 1         VL31B5263E-F8S DIE REV-0 PCB REV-0      MFR ID-ce80
  DIMM 2         VL31B5263E-F8S DIE REV-0 PCB REV-0      MFR ID-ce80
  DIMM 3         SL31B5263E-F8S DIE REV-0 PCB REV-0      MFR ID-ce80
CB 0             REV 03   710-021523   XD7225            MX SCB
Fan Tray 0       REV 01   710-021113   WZ4986            MX240 Fan Tray
```

**show chassis hardware (MX240 Router with Enhanced MX SCB)**

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN10C7F7EAFC      MX240
Midplane         REV 01   710-021041   TR1502            MX240 Backplane
FPM Board        REV 01   710-017254   KD4017            Front Panel Display
PEM 0            Rev 02   740-017330   000332            PS 1.2-1.7kW; 100-240V
AC in
PEM 1            Rev 02   740-017330   000226            PS 1.2-1.7kW; 100-240V
AC in
Routing Engine 0 REV 06   740-013063   1000703522        RE-S-2000
Routing Engine 1 REV 06   740-015113   1000687625        RE-S-1300
CB 0             REV 02   710-031391   YE8494            Enhanced MX SCB
CB 1             REV 05   710-031391   YOP5764           Enhanced MX SCB
FPC 1            REV 01   750-021679   KC7340            DPCE 40x 1GE R
  CPU            REV 06   710-013713   KD4078            DPC PMB
  PIC 0                   BUILTIN      BUILTIN           10x 1GE(LAN)
    Xcvr 0       REV 01   740-011613   P9F18ME           SFP-SX
  PIC 1                   BUILTIN      BUILTIN           10x 1GE(LAN)
  PIC 2                   BUILTIN      BUILTIN           10x 1GE(LAN)
  PIC 3                   BUILTIN      BUILTIN           10x 1GE(LAN)
FPC 2            REV 04   710-016669   JS4529            DPCE 40x 1GE R EQ
  CPU            REV 06   710-013713   KB3969            DPC PMB
  PIC 0                   BUILTIN      BUILTIN           10x 1GE(LAN) EQ
    Xcvr 0       REV 01   740-011613   PBG3Y79           SFP-SX
    Xcvr 1       REV 01   740-011613   PBG3XU8           SFP-SX
    Xcvr 2       REV 01   740-011613   PBG3YG6           SFP-SX
    Xcvr 3       REV 01   740-011613   PBG3XUG           SFP-SX
    Xcvr 4       REV 01   740-011613   PBG3XTJ           SFP-SX
  PIC 1                   BUILTIN      BUILTIN           10x 1GE(LAN) EQ
    Xcvr 0       REV 01   740-011613   PBG3ZUM           SFP-SX
    Xcvr 1       REV 01   740-011613   PBG3Y5H           SFP-SX
    Xcvr 2       REV 01   740-011613   PBG3UZT           SFP-SX
    Xcvr 3       REV 01   740-011613   PBG3US1           SFP-SX
```

```
  PIC 2                   BUILTIN      BUILTIN           10x 1GE(LAN) EQ
    Xcvr 0       REV 01   740-011613   PBG3YG7           SFP-SX
    Xcvr 1       REV 01   740-011613   PBG3XZ9           SFP-SX
    Xcvr 2       REV 01   740-011613   PBG3XTY           SFP-SX
    Xcvr 3       REV 01   740-011613   PBG3UZG           SFP-SX
  PIC 3                   BUILTIN      BUILTIN           10x 1GE(LAN) EQ
    Xcvr 0       REV 01   740-011613   PBG3Y8W           SFP-SX
    Xcvr 1       REV 01   740-011613   PBG3YVX           SFP-SX
    Xcvr 2       REV 01   740-011613   PBG3YB3           SFP-SX
    Xcvr 3       REV 01   740-011613   PBG43VQ           SFP-SX
Fan Tray 0       REV 01   710-021113   JS4642            MX240 Fan Tray
```

### show chassis hardware (MX480 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN10C7F7FAFB      MX480
Midplane         REV 04   710-017414   TR2071            MX480 Midplane
FPM Board        REV 02   710-017254   KB8459            Front Panel Display
PEM 0            Rev 02   740-017330   QCS07519029       PS 1.2-1.7kW; 100-240V
AC in
PEM 1            Rev 02   740-017330   QCS07519041       PS 1.2-1.7kW; 100-240V
AC in
PEM 2            Rev 02   740-017330   QCS07519097       PS 1.2-1.7kW; 100-240V
AC in
Routing Engine 0 REV 07   740-013063   1000733381        RE-S-2000
Routing Engine 1 REV 07   740-013063   1000733540        RE-S-2000
CB 0             REV 07   710-013385   KA8022            MX SCB
CB 1             REV 07   710-013385   KA8303            MX SCB
FPC 0            REV 09   750-020452   KA8660            DPCE 40x 1GE X EQ
  CPU            REV 06   710-013713   KA8185            DPC PMB
  PIC 0                   BUILTIN      BUILTIN           10x 1GE(LAN) EQ
  PIC 1                   BUILTIN      BUILTIN           10x 1GE(LAN) EQ
  PIC 2                   BUILTIN      BUILTIN           10x 1GE(LAN) EQ
  PIC 3                   BUILTIN      BUILTIN           10x 1GE(LAN) EQ
Fan Tray                                                 Left Fan Tray
```

### show chassis hardware (MX480 Router with Enhanced MX SCB)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN10C7F7FAFB      MX480
Midplane         REV 04   710-017414   TR2071            MX480 Midplane
FPM Board        REV 02   710-017254   KB8459            Front Panel Display
PEM 0            Rev 02   740-017330   QCS07519029       PS 1.2-1.7kW; 100-240V
AC in
PEM 1            Rev 02   740-017330   QCS07519041       PS 1.2-1.7kW; 100-240V
AC in
PEM 2            Rev 02   740-017330   QCS07519097       PS 1.2-1.7kW; 100-240V
AC in
Routing Engine 0 REV 07   740-013063   1000733381        RE-S-2000
Routing Engine 1 REV 07   740-013063   1000733540        RE-S-2000
CB 0             REV 07   710-013385   KA8022            Enhanced MX SCB
CB 1             REV 07   710-013385   KA8303            Enhanced MX SCB
FPC 0            REV 09   750-020452   KA8660            DPCE 40x 1GE X EQ
  CPU            REV 06   710-013713   KA8185            DPC PMB
  PIC 0                   BUILTIN      BUILTIN           10x 1GE(LAN) EQ
  PIC 1                   BUILTIN      BUILTIN           10x 1GE(LAN) EQ
  PIC 2                   BUILTIN      BUILTIN           10x 1GE(LAN) EQ
  PIC 3                   BUILTIN      BUILTIN           10x 1GE(LAN) EQ
Fan Tray                                                 Left Fan Tray
```

**show chassis hardware (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 Router with Enhanced MX SCB)**

```
user@host> show chassis hardware models
Hardware inventory:
Item             Version  Part number  Serial number     FRU model number
Midplane         REV 03   710-013698   TR0183            CHAS-BP-MX960-S
Fan Extender     REV 02   710-018051   JY5227            ECM-MX960
FPM Board        REV 03   710-014974   JZ6876            CRAFT-MX960-S
Routing Engine 0 REV 06   740-013063   1000687969        RE-S-2000-4096-S
Routing Engine 1 REV 06   740-013063   1000687955        RE-S-2000-4096-S
CB 0             REV 11   750-031391   YZ6072            SCBE-MX-S
CB 1             REV 11   750-031391   YZ6068            SCBE-MX-S
CB 2             REV 11   750-031391   YZ6081            SCBE-MX-S
FPC 0            REV 01   750-018122   KA5576            DPCE-R-40GE-SFP
FPC 1            REV 16   750-031089   YL0719            MX-MPC2-3D
  MIC 0          REV 07   750-028387   JR6500            MIC-3D-4XGE-XFP
  MIC 1          REV 24   750-028387   YJ3950            MIC-3D-4XGE-XFP
FPC 2            REV 08   710-014219   JY9654            DPC-R-4XGE-XFP
FPC 3            REV 10   750-024199   XJ6692            MX-FPC3
  PIC 0          REV 17   750-009553   RJ2945            PC-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
```

**show chassis hardware detail (MX960 Router)**

```
user@host> show chassis hardware detail
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                                  MX960
Midplane         REV 01   710-013698   AA6082            MX960 Midplane
PIM              Rev 01   740-013110   000008            Power Inlet Module
PEM 2
PEM 3            Rev 01   740-013682   000038            PS 1.7kW; 200-240VAC in
Routing Engine 0 REV 00   740-015113   1000617944        RE-S-1300
  ad0     245 MB  SanDisk SDCFB-256    111419E1805T1141  Compact Flash
  ad2   38154 MB  FUJITSU MHT2040BH    NR0WT5925N77      Hard Disk
CB 0             REV 05   710-013725   JK6947            MX960 Test SCB
FPC 4            REV 01   710-013305   JM7617            MX960 Test DPC
  CPU
  PIC 0                   BUILTIN      BUILTIN           1x 10GE(LAN/WAN)
  PIC 1                   BUILTIN      BUILTIN           10x 1GE
FPC 7            REV 01   710-013305   JL9634            MX960 Test DPC
  CPU
  PIC 0                   BUILTIN      BUILTIN           1x 10GE(LAN/WAN)
    Xcvr 0                NON-JNPR     MYBG65I82C        XFP-10G-SR
  PIC 1                   BUILTIN      BUILTIN           10x 1GE
    Xcvr 1       REV 01   740-011782   P7N0368           SFP-SX
    Xcvr 4       REV 01   740-011782   P8J1W27           SFP-SX
    Xcvr 6       REV 01   740-011782   P8J1VSD           SFP-SX
    Xcvr 9       REV 01   740-011782   P8J1W25           SFP-SX
Fan Tray 0
Fan Tray 1
```

**show chassis hardware (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 lcc (TX Matrix Router)**

```
user@host> show chassis hardware lcc 0
lcc0-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                65751             T640
```

```
Midplane         REV 03   710-005608   RA1408            T640 Backplane
FPM GBUS         REV 09   710-002901   RA2784            T640 FPM Board
FPM Display      REV 05   710-002897   RA2825            FPM Display
CIP              REV 06   710-002895   HT0684            T Series CIP
PEM 0            Rev 11   740-002595   PM18483           Power Entry Module
PEM 1            Rev 11   740-002595   qb13984           Power Entry Module
SCG 0            REV 11   710-003423   HT0022            T640 Sonet Clock Gen.
Routing Engine 0 REV 13   740-005022   210865700363      RE-3.0 (RE-600)
CB 0             REV 03   710-007655   HW1195            Control Board (CB-T)
FPC 1            REV 05   710-007527   HM3245            FPC Type 2
  CPU            REV 14   710-001726   HM1084            FPC CPU
  PIC 0          REV 02   750-007218   AZ1112            2x OC-12 ATM2 IQ, SMIR
  PIC 1          REV 02   750-007745   HG3462            4x OC-3 SONET, SMIR
  PIC 2          REV 14   750-001901   BA5390            4x OC-12 SONET, SMIR
  PIC 3          REV 09   750-008155   HS3012            2x G/E IQ, 1000 BASE
    SFP 0                 NON-JNPR     P1186TY           SFP-S
    SFP 1        REV 01   740-007326   P11WLTF           SFP-SX
  MMB 1          REV 02   710-005555   HL7514            MMB-288mbit
  PPB 0          REV 04   710-003758   HM4405            PPB Type 2
  PPB 1          REV 04   710-003758   AV1960            PPB Type 2
FPC 2            REV 08   710-010154   HZ3578            E-FPC Type 3
  CPU            REV 05   710-010169   HZ3219            FPC CPU-Enhanced
  PIC 0          REV 02   750-009567   HX2882            1x 10GE(LAN),XENPAK
    SFP 0        REV 01   740-009898   USC202U709        XENPAK-LR
  PIC 1          REV 03   750-003336   HJ9954            4x OC-48 SONET, SMSR
  PIC 2          REV 01   750-004535   HC0235            1x OC-192 SM SR1
  PIC 3          REV 07   750-007141   HX1699            10x 1GE(LAN), 1000 BASE

    SFP 0        REV 01   740-007326   2441042           SFP-SX
    SFP 1        REV 01   740-007326   2441027           SFP-SX
  MMB 0          REV 03   710-010171   HV2365            MMB-5M3-288mbit
  MMB 1          REV 03   710-010171   HZ3888            MMB-5M3-288mbit
SPMB 0           REV 09   710-003229   HW5245            T Series Switch CPU
SIB 3            REV 07   710-005781   HR5927            SIB-L8-F16
  B Board        REV 06   710-005782   HR5971            SIB-L8-F16 (B)
SIB 4            REV 07   710-005781   HR5903            SIB-L8-F16
  B Board        REV 06   710-005782   HZ5275            SIB-L8-F16 (B)
```

### show chassis hardware scc (TX Matrix Router)

```
user@host> show chassis hardware scc
scc-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                                  TX Matrix
Midplane         REV 04   710-004396   RB0014            SCC Midplane
FPM GBUS         REV 04   710-004617   HW9141            SCC FPM Board
FPM Display      REV 04   710-004619   HS5950            SCC FPM
CIP 0            REV 01   710-010218   HV9151            SCC CIP
CIP 1            REV 01   710-010218   HV9152            SCC CIP
PEM 1            Rev 11   740-002595   QB13977           Power Entry Module
Routing Engine 0 REV 05   740-008883   P11123900153      RE-4.0 (RE-1600)
CB 0             REV 01   710-011709   HR5964            Control Board (CB-TX)
SPMB 0           REV 09   710-003229   HW5293            T Series Switch CPU
SIB 3
SIB 4            REV 01   710-005839   HW1177            SIB-S8-F16
  B Board        REV 01   710-005840   HW1202            SIB-S8-F16 (B)
```

### show chassis hardware (T1600 Router)

```
user@host> show chassis hardware
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                B2703             T1600
```

```
Midplane         REV 03   710-005608   RC4137           T640 Backplane
FPM GBUS         REV 10   710-002901   DT7062           T640 FPM Board
FPM Display      REV 05   710-002897   DS3067           FPM Display
CIP              REV 06   710-002895   DT3386           T-series CIP
PEM 0            Rev 07   740-017906   UA26344          Power Entry Module 3x80
PEM 1            Rev 18   740-002595   UF38441          Power Entry Module
SCG 0            REV 15   710-003423   DV0941           T640 Sonet Clock Gen.
Routing Engine 0 REV 08   740-014082   9009014502       RE-A-2000
Routing Engine 1 REV 07   740-014082   9009009591       RE-A-2000
CB 0             REV 05   710-007655   JA9360           Control Board (CB-T)
CB 1             REV 03   710-017707   DT3251           Control Board (CB-T)
FPC 0            REV 07   710-013558   DR4253           E2-FPC Type 2
  CPU            REV 05   710-013563   DS3902           FPC CPU-Enhanced
  PIC 0          REV 01   750-010618   CB5446           4x G/E SFP, 1000 BASE
    Xcvr 0       REV 01   740-011613   P9F11CW          SFP-SX
    Xcvr 1       REV 01   740-011613   P9F15C2          SFP-SX
    Xcvr 2       REV 01   740-011782   PB94K0L          SFP-SX
  PIC 1          REV 06   750-001900   HB6399           1x OC-48 SONET, SMSR
  PIC 2          REV 14   750-001901   AP1092           4x OC-12 SONET, SMIR
  PIC 3          REV 07   750-001900   AR8275           1x OC-48 SONET, SMSR
  MMB 1          REV 07   710-010171   DS1524           MMB-5M3-288mbit
FPC 1            REV 06   710-013553   DL9067           E2-FPC Type 1
  CPU            REV 04   710-013563   DM1685           FPC CPU-Enhanced
  PIC 0          REV 08   750-001072   AB1688           1x G/E, 1000 BASE-SX
  PIC 1          REV 10   750-012266   JX5519           4x 1GE(LAN), IQ2
    Xcvr 0       REV 01   740-011613   AM0812S8UK6      SFP-SX
    Xcvr 2       REV 01   740-011613   AM0812S8UK1      SFP-SX
    Xcvr 3       REV 01   740-011782   P8N1YHG          SFP-SX
  PIC 2          REV 22   750-005634   DP0083           1x CHOC12 IQ SONET, SMIR

  MMB 1          REV 07   710-008923   DN1862           MMB 3M 288-bit
FPC 2            REV 01   710-005548   HJ9899           FPC Type 3
  CPU            REV 06   710-001726   HC0586           FPC CPU
  PIC 0          REV 16   750-007141   NC9660           10x 1GE(LAN), 1000 BASE

    Xcvr 0       REV 01   740-011613   AM0812S8XAR      SFP-SX
    Xcvr 1       REV 01   740-011782   P920E7B          SFP-SX
    Xcvr 2       REV 01   740-011613   AM0812S8XAU      SFP-SX
    Xcvr 4       REV 01   740-011613   AM0812S8XAK      SFP-SX
    Xcvr 5       REV 01   740-011613   AM0812S8XAA      SFP-SX
    Xcvr 6       REV 01   740-011613   PAJ4NKY          SFP-SX
    Xcvr 7       REV 01   740-011613   AM0812S8UJW      SFP-SX
    Xcvr 8       REV 01   740-011782   PB81X89          SFP-SX
    Xcvr 9       REV 01   740-011613   AM0812S8UJX      SFP-SX
  PIC 1          REV 06   750-015217   DK3280           8x 1GE(TYPE3), IQ2
    Xcvr 0       REV 01   740-011782   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
  MMB 1         REV 04   710-016036   DK4060          ST-MMB2
FPC 6           REV 14   710-013037   DV1431          FPC Type 4-ES
  CPU           REV 09   710-016744   DT9020          ST-PMB2
  PIC 0         REV 11   750-017405   DM6261          4x 10GE (LAN/WAN) XFP
    Xcvr 0      REV 01   740-014289   C701XU05Q       XFP-10G-SR
    Xcvr 1      REV 01   740-014279   AA0748N1HPT     XFP-10G-LR
    Xcvr 2      REV 01   740-014289   T08E19189       XFP-10G-SR
    Xcvr 3      REV 01   740-014289   C715XU058       XFP-10G-SR
  PIC 1         REV 13   750-017405   DP8772          4x 10GE (LAN/WAN) XFP
    Xcvr 0      REV 02   740-011571   C850XJ037       XFP-10G-SR
    Xcvr 1      REV 02   740-014289   C839XU0L9       XFP-10G-SR
    Xcvr 2      REV 02   740-014289   C834XU05A       XFP-10G-SR
    Xcvr 3      REV 02   740-014289   C810XU0CE       XFP-10G-SR
  MMB 0         REV 01   710-025563   DT8454          ST-MMB2
  MMB 1         REV 01   710-025563   DT8366          ST-MMB2
FPC 7           REV 09   710-007529   HZ7624          FPC Type 3
  CPU           REV 15   710-001726   HZ1413          FPC CPU
  PIC 0         REV 10   750-012793   DM5627          1x 10GE(LAN/WAN) IQ2
    Xcvr 0      REV 02   740-011571   C831XJ062       XFP-10G-SR
  PIC 1         REV 01   750-015217   JT6762          8x 1GE(TYPE3), IQ2
    Xcvr 0      REV 01   740-011782   P8Q25JU         SFP-SX
    Xcvr 1      REV 01   740-011782   P9B0U0K         SFP-SX
  PIC 2         REV 01   750-015217   JS4268          8x 1GE(TYPE3), IQ2
    Xcvr 0      REV 01   740-011613   AM0812S8XBZ     SFP-SX
    Xcvr 1      REV 01   740-011613   AM0812S8XAP     SFP-SX
    Xcvr 2      REV 01   740-011613   AM0812S8XBY     SFP-SX
    Xcvr 3      REV 01   740-011613   AM0812S8XBX     SFP-SX
    Xcvr 4      REV 01   740-011613   P9F1652         SFP-SX
    Xcvr 5      REV 01   740-011782   P8Q21YC         SFP-SX
```

```
    Xcvr 6        REV 01   740-011782   P8Q27HQ           SFP-SX
    Xcvr 7        REV 01   740-011613   P8E2SSU           SFP-SX
  PIC 3           REV 15   750-009450   NB6790            1x OC-192 SM SR2
  MMB 0           REV 03   710-005555   HZ3450            MMB-288mbit
  MMB 1           REV 03   710-005555   HZ3415            MMB-288mbit
  PPB 0           REV 04   710-002845   HP0887            PPB Type 3
  PPB 1           REV 04   710-002845   HW5255            PPB Type 3
SPMB 0            REV 10   710-003229   HX3699            T-series Switch CPU
SPMB 1            REV 12   710-003229   DT3091            T-series Switch CPU
SIB 0             REV 07   710-013074   DS4747            SIB-I8-SF
SIB 1             REV 07   710-013074   DS4942            SIB-I8-SF
SIB 2             REV 07   710-013074   DS4965            SIB-I8-SF
SIB 3             REV 07   710-013074   DS4990            SIB-I8-SF
SIB 4             REV 07   710-013074   DS4944            SIB-I8-SF
Fan Tray 0                                                Front Top Fan Tray
Fan Tray 1                                                Front Bottom Fan Tray
Fan Tray 2                                                Rear Fan Tray -- Rev 2
```

### show chassis hardware (TX Matrix Plus Router)

```
user@host> show chassis hardware
sfc0-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item              Version  Part number  Serial number     Description
Chassis                                 JN113186EAHB      TXP
Midplane          REV 05   710-022574   TS3822            SFC Midplane
FPM Display       REV 03   710-024027   DW4701            TXP FPM Display
CIP 0             REV 05   710-023792   DW7998            TXP CIP
CIP 1             REV 05   710-023792   DW7999            TXP CIP
PEM 0             Rev 04   740-027463   UM26367           Power Entry Module
PEM 1             Rev 04   740-027463   UM26346           Power Entry Module
Routing Engine 0 REV 06    740-026942   737A-1081         RE-DUO-2600
Routing Engine 1 REV 06    740-026942   737A-1043         RE-DUO-2600
CB 0              REV 05   710-022606   DW4435            SFC Control Board
CB 1              REV 09   710-022606   DW6100            SFC Control Board
SPMB 0                     BUILTIN                        SFC Switch CPU
SPMB 1                     BUILTIN                        SFC Switch CPU
SIB F13 0         REV 04   750-024564   DW5764            F13 SIB
  B Board         REV 03   710-023431   DW9053            F13 SIB Mezz
SIB F13 3         REV 04   750-024564   DW5785            F13 SIB
  B Board         REV 03   710-023431   DW9030            F13 SIB Mezz
SIB F13 6
SIB F13 8         REV 04   750-024564   DW5752            F13 SIB
  B Board         REV 03   710-023431   DW9051            F13 SIB Mezz
SIB F13 11        REV 04   750-024564   DW5782            F13 SIB
  B Board         REV 03   710-023431   DW9058            F13 SIB Mezz
SIB F13 12        REV 03   750-024564   DT9466            F13 SIB
  B Board         REV 02   710-023431   DT6556            F13 SIB Mezz
SIB F2S 0/0       REV 05   710-022603   DW7898            F2S SIB
  B Board         REV 05   710-023787   DW7625            F2S SIB Mezz
SIB F2S 0/2       REV 05   710-022603   DW7811            F2S SIB
  B Board         REV 05   710-023787   DW7550            F2S SIB Mezz
SIB F2S 0/4       REV 04   710-022603   DW4873            F2S SIB
  B Board         REV 05   710-023787   DW8509            F2S SIB Mezz
SIB F2S 0/6       REV 04   710-022603   DW4867            F2S SIB
  B Board         REV 05   710-023787   DW8472            F2S SIB Mezz
SIB F2S 1/0       REV 04   710-022603   DW4871            F2S SIB
  B Board         REV 05   710-023787   DW8497            F2S SIB Mezz
SIB F2S 1/2       REV 05   710-022603   DW7868            F2S SIB
  B Board         REV 05   710-023787   DW7551            F2S SIB Mezz
SIB F2S 1/4       REV 04   710-022603   DW4854            F2S SIB
  B Board         REV 05   710-023787   DW8496            F2S SIB Mezz
```

```
SIB F2S 1/6      REV 05   710-022603   DW7889            F2S SIB
  B Board        REV 05   710-023787   DW7496            F2S SIB Mezz
SIB F2S 2/0      REV 04   710-022603   DW4852            F2S SIB
  B Board        REV 05   710-023787   DW8498            F2S SIB Mezz
SIB F2S 2/2      REV 04   710-022603   DW4845            F2S SIB
  B Board        REV 05   710-023787   DW8457            F2S SIB Mezz
SIB F2S 2/4      REV 05   710-022603   DW7802            F2S SIB
  B Board        REV 05   710-023787   DW7562            F2S SIB Mezz
SIB F2S 2/6      REV 04   710-022603   DW4822            F2S SIB
  B Board        REV 05   710-023787   DW8467            F2S SIB Mezz
SIB F2S 3/0      REV 05   710-022603   DW7815            F2S SIB
  B Board        REV 05   710-023787   DW7518            F2S SIB Mezz
SIB F2S 3/2      REV 03   710-022603   DV0068            F2S SIB
  B Board        REV 03   710-023787   DT9974            F2S SIB Mezz
SIB F2S 3/4      REV 05   710-022603   DW7874            F2S SIB
  B Board        REV 05   710-023787   DW7601            F2S SIB Mezz
SIB F2S 3/6      REV 03   710-022603   DV0033            F2S SIB
  B Board        REV 03   710-023787   DT9969            F2S SIB Mezz
SIB F2S 4/0      REV 03   710-022603   DV0043            F2S SIB
  B Board        REV 03   710-023787   DT9948            F2S SIB Mezz
SIB F2S 4/2      REV 05   710-022603   DW5446            F2S SIB
  B Board        REV 05   710-023787   DW7611            F2S SIB Mezz
SIB F2S 4/4      REV 04   710-022603   DW4826            F2S SIB
  B Board        REV 05   710-023787   DW8458            F2S SIB Mezz
SIB F2S 4/6      REV 03   710-022603   DV0026            F2S SIB
  B Board        REV 03   710-023787   DT9963            F2S SIB Mezz
Fan Tray 0       REV 02   760-024497   DR8290            Front Fan Tray
Fan Tray 1       REV 02   760-024497   DR8293            Front Fan Tray
Fan Tray 2       REV 05   760-024502   DR8280            Rear Fan Tray
Fan Tray 3
Fan Tray 4       REV 05   760-024502   DR8276            Rear Fan Tray
Fan Tray 5       REV 02   760-024502   DP5643            Rear Fan Tray

lcc0-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN11036F8AHA      T1600
Midplane         REV 03   710-017247   RC3799            T-series Backplane
FPM GBUS         REV 10   710-002901   DP7009            T640 FPM Board
FPM Display      REV 01   710-021387   DN7026            T1600 FPM Display
CIP              REV 06   710-002895   DP6024            T-series CIP
PEM 1           Rev 02   740-023211   WA50019          Power Entry Module 4x60A
SCG 0            REV 15   710-003423   DR6757            T640 Sonet Clock Gen.
SCG 1            REV 15   710-003423   DS2225            T640 Sonet Clock Gen.
Routing Engine 0 REV 01   740-026941   737F-1040         RE-DUO-1800
Routing Engine 1 REV 01   740-026941   737F-1016         RE-DUO-1800
CB 0             REV 06   710-022597   DX4011            LCC Control Board
CB 1             REV 06   710-022597   DX4017            LCC Control Board
FPC 1            REV 07   710-013035   DN5847            FPC Type 3-ES
  CPU            REV 08   710-016744   DP2570            ST-PMB2
  PIC 0          REV 05   750-015217   DB0418            8x 1GE(TYPE3), IQ2
    Xcvr 0       REV 01   740-011782   P8Q27ZG           SFP-SX
    Xcvr 1                NON-JNPR     PDA1U0D           SFP-SX
    Xcvr 2       REV 01   740-011613   P9F1ALW           SFP-SX
    Xcvr 3       REV 01   740-011782   PBA403V           SFP-SX
    Xcvr 4                NON-JNPR     PDE09DP           SFP-SX
    Xcvr 5       REV 01   740-011782   PCH2P4K           SFP-SX
    Xcvr 6       REV 01   740-011782   PB94K0F           SFP-SX
    Xcvr 7       REV 01   740-011782   PBA2R2A           SFP-SX
  PIC 1          REV 03   750-004424   HJ4020            1x 10GE(LAN),DWDM
```

```
  PIC 2          REV 01   750-003336   HG6073            4x OC-48 SONET, SMSR
  MMB 0          REV 04   710-016036   DP3401            ST-MMB2
FPC 3            REV 12   710-013037   DR1169            FPC Type 4-ES
  CPU            REV 08   710-016744   DP9429            ST-PMB2
  PIC 0          REV 02   750-010850   JA0332            1x OC-768 SONET SR
  MMB 0          REV 04   710-016036   DR0628            ST-MMB2
  MMB 1          REV 04   710-016036   DR0592            ST-MMB2
FPC 4            REV 05   710-021534   DR7350            FPC Type 1-ES
  CPU            REV 08   710-016744   DP8096            ST-PMB2
  PIC 0          REV 04   750-014627   DP9171            4x OC-3 1x OC-12 SFP
    Xcvr 0       REV 02   740-011615   PDE2RVR           SFP-SR
  PIC 1         REV 22   750-005634   DS5815           1x CHOC12 IQ SONET, SMIR

  PIC 2          REV 09   750-002911   CF4539            4x F/E, 100 BASE-TX
  PIC 3          REV 08   750-021652   DR2827            1x CHOC12 IQE SONET
    Xcvr 0                NON-JNPR     8                 UNKNOWN
  MMB 0          REV 04   710-016036   DR0809            ST-MMB2
FPC 5            REV 07   710-007529   HS5608            FPC Type 3
  CPU            REV 15   710-001726   HX4351            FPC CPU
  PIC 0          REV 14   750-009567   WJ8961            1x 10GE(LAN),XENPAK
    Xcvr 0       REV 01   740-013170   J05K05961         XENPAK-LR
  PIC 1          REV 16   750-007141   JJ8146           10x 1GE(LAN), 1000 BASE

    Xcvr 1       REV 01   740-011613   P9F117T           SFP-SX
    Xcvr 2       REV 01   740-011782   PBA2VCL           SFP-SX
    Xcvr 3       REV 01   740-011782   PB83DRB           SFP-SX
    Xcvr 4       REV 01   740-011613   AM0812S8UP8       SFP-SX
  PIC 2          REV 12   750-009567   WF3566            1x 10GE(LAN),XENPAK
    Xcvr 0       REV 02   740-013170   T07C94489         XENPAK-LR
  MMB 0          REV 03   710-005555   HZ1907            MMB-288mbit
  MMB 1          REV 03   710-005555   HW5283            MMB-288mbit
  PPB 0          REV 04   710-002845   HZ7717            PPB Type 3
  PPB 1          REV 04   710-002845   HS0110            PPB Type 3
FPC 6            REV 07   710-013035   DP7486            FPC Type 3-ES
  CPU            REV 08   710-016744   DP2545            ST-PMB2
  PIC 0          REV 09   750-009567   NE6323            1x 10GE(LAN),XENPAK
    Xcvr 0       REV 02   740-013170   T09C71959         XENPAK-LR
  PIC 1          REV 06   750-015217   DN4775            8x 1GE(TYPE3), IQ2
    Xcvr 0       REV 01   740-011782   P7E0T6M           SFP-SX
    Xcvr 1       REV 01   740-011613   AM0812S8XAY       SFP-SX
    Xcvr 2       REV 01   740-011782   P7E0T6J           SFP-SX
    Xcvr 3       REV 01   740-011782   PCH2P7D           SFP-SX
    Xcvr 4       REV 01   740-011782   P9B0QYT           SFP-SX
    Xcvr 5       REV 01   740-011613   AM0812S8WQJ       SFP-SX
    Xcvr 6       REV 02   740-013111   9301220           SFP-T
    Xcvr 7       REV 01   740-011782   P9B0TZ5           SFP-SX
  PIC 2          REV 06   750-015217   DM6747            8x 1GE(TYPE3), IQ2
    Xcvr 0       REV 01   740-011613   PAP0ZB2           SFP-SX
    Xcvr 1       REV 01   740-013111   70191002          SFP-T
    Xcvr 6       REV 01   740-011782   PBA29H8           SFP-SX
    Xcvr 7       REV 01   740-011613   AM0812S8WQG       SFP-SX
  MMB 0          REV 04   710-016036   DP3238            ST-MMB2
FPC 7            REV 03   710-021540   DV3154            FPC Type 2-ES
  CPU            REV 09   710-016744   DT9053            ST-PMB2
  PIC 0          REV 13   750-001901   HB4225            4x OC-12 SONET, SMIR
  PIC 1          REV 05   750-001900   AD3644            1x OC-48 SONET, SMSR
  PIC 2          REV 10   750-008155   HV0335            2x G/E IQ, 1000 BASE
    Xcvr 0       REV 01   740-011782   PCH2UKF           SFP-SX
    Xcvr 1       REV 01   740-011782   PCH2V19           SFP-SX
  PIC 3          REV 03   750-014638   JS9493            1x OC-48-12-3 SFP
    Xcvr 0       REV 01   740-011785   P6Q0ENK           SFP-SR
```

```
  MMB 0          REV 05   710-016036   DP3323           ST-MMB2
SPMB 0           REV 04   710-023321   DX3004           LCC Switch CPU
SPMB 1           REV 04   710-023321   DX3009           LCC Switch CPU
SIB 0            REV 07   710-022594   DW4195           LCC SIB
  B Board        REV 07   710-023185   DW3930           LCC SIB Mezz
SIB 1            REV 07   710-022594   DW4179           LCC SIB
  B Board        REV 07   710-023185   DW3919           LCC SIB Mezz
SIB 2
SIB 3            REV 06   710-022594   DT8251           LCC SIB
  B Board        REV 06   710-023185   DT5792           LCC SIB Mezz
SIB 4            REV 08   710-022594   DW8014           LCC SIB
  B Board        REV 07   710-023185   DW3917           LCC SIB Mezz
Fan Tray 0                                              Front Top Fan Tray
Fan Tray 1                                              Front Bottom Fan Tray
Fan Tray 2                                              Rear Fan Tray -- Rev 3

lcc1-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN1102270AHA      T1600
Midplane         REV 04   710-017247   RC5358            T-series Backplane
FPM GBUS         REV 10   710-002901   DS3443            T640 FPM Board
FPM Display      REV 01   710-021387   DS6411            T1600 FPM Display
CIP              REV 06   710-002895   DS4235            T-series CIP
PEM 0           Rev 02   740-023211   VM82438          Power Entry Module 4x60A
SCG 0            REV 15   710-003423   DS6649            T640 Sonet Clock Gen.
SCG 1            REV 15   710-003423   DR6775            T640 Sonet Clock Gen.
Routing Engine 0 REV 01   740-026941   737F-1083         RE-DUO-1800
Routing Engine 1 REV 01   740-026941   737F-1104         RE-DUO-1800
CB 0             REV 06   710-022597   DW8542            LCC Control Board
CB 1             REV 06   710-022597   DW8530            LCC Control Board
FPC 0            REV 02   710-010845   JE2392            FPC Type 4
  CPU            REV 02   710-011481   JF6820            FPC CPU-Enhanced
  PIC 0          REV 11   750-017405   DP7259            4x 10GE (LAN/WAN) XFP
    Xcvr 0       REV 01   740-014279   AA0741N1C8T       XFP-10G-LR
    Xcvr 1       REV 01   740-014279   AA0746N1GAM       XFP-10G-LR
    Xcvr 2       REV 01   740-014279   AA0747N1H0B       XFP-10G-LR
    Xcvr 3       REV 01   740-014279   AA0748N1HZ5       XFP-10G-LR
  MMB 0          REV 03   710-010842   HY7601            ST-MMB
FPC 1            REV 16   710-013037   BBAA7398          FPC Type 4-ES
  CPU            REV 09   710-016744   BBAA2329          ST-PMB2
  PIC 0          REV 03   711-029996   EB1575            100GE
  PIC 1          REV 06   750-034781   EB9980            100GE CFP
  MMB 0          REV 04   710-025563   BBAA5325          ST-MMB2
  MMB 1          REV 04   710-025563   BBAA5444          ST-MMB2
FPC 2            REV 16   710-013037   BBAA7185          FPC Type 4-ES
  CPU            REV 09   710-016744   BBAA3522          ST-PMB2
  PIC 0          REV 03   711-029996   EB1557            100GE
  PIC 1          REV 05   750-034781   EB4660            100GE CFP
    Xcvr 0       REV 0    740-032210   J10F73666         CFP-100G-LR4
  BRIDGE 0       REV 02   711-029995   EB2237            100GE Bridge Board
  MMB 0          REV 04   710-025563   BBAA5347          ST-MMB2
  MMB 1          REV 04   710-025563   BBAA5401          ST-MMB2
FPC 3            REV 10   710-021534   DZ0941            FPC Type 1-ES
  CPU            REV 09   710-016744   DY6364            ST-PMB2
  PIC 0          REV 13   750-012266   DK9192            4x 1GE(LAN), IQ2
    Xcvr 0       REV 01   740-011613   AM0812S8WVD       SFP-SX
    Xcvr 1                NON-JNPR     PDD63Q4           SFP-SX
    Xcvr 2                NON-JNPR     PDE4G54           SFP-SX
    Xcvr 3                NON-JNPR     PD40MAG           SFP-SX
```

```
  PIC 1          REV 01   750-007641   HJ2003           1x G/E IQ, 1000 BASE
    Xcvr 0       REV 01   740-011613   AM0812S8WVG      SFP-SX
  PIC 3          REV 17   750-007444   JB6873           1x CHSTM1 IQ SDH, SMIR
  MMB 0          REV 04   710-025563   DZ0281           ST-MMB2
FPC 4            REV 06   710-013035   DK0614           FPC Type 3-ES
  CPU            REV 07   710-016744   DK1616           ST-PMB2
  PIC 0          REV 22   750-007141   DM1870           10x 1GE(LAN), 1000 BASE

    Xcvr 0       REV 01   740-011782   PCL3UKW          SFP-SX
    Xcvr 1       REV 01   740-011782   P7E0T73          SFP-SX
    Xcvr 2       REV 01   740-007326   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
    Xcvr 3       REV 01   740-011785   PDE1KXP          SFP-SR
  MMB 0          REV 07   710-010171   DP7374           MMB-5M3-288mbit
  MMB 1          REV 07   710-010171   DP7404           MMB-5M3-288mbit
FPC 6            REV 07   710-013035   DM0994           FPC Type 3-ES
  CPU            REV 07   710-016744   DM3651           ST-PMB2
  PIC 0          REV 07   750-015217   DN4743           8x 1GE(TYPE3), IQ2
    Xcvr 3       REV 01   740-011613   AM0812S8XB0      SFP-SX
    Xcvr 4       REV 01   740-011782   PB829RB          SFP-SX
    Xcvr 5       REV 01   740-011782   P8J1SYX          SFP-SX
  PIC 1          REV 03   750-003336   HJ9954           4x OC-48 SONET, SMSR
  PIC 3          REV 02   750-012793   JM7665           1x 10GE(LAN/WAN) IQ2
  MMB 0          REV 04   710-016036   DN6913           ST-MMB2
FPC 7            REV 08   710-010845   JM3958           FPC Type 4
  CPU            REV 04   710-011481   JK3669           FPC CPU-Enhanced
  PIC 0          REV 11   750-017405   DP8837           4x 10GE (LAN/WAN) XFP
    Xcvr 1       REV 01   740-014279   753019A00277     XFP-10G-LR
    Xcvr 2       REV 02   740-011571   C850XJ00P        XFP-10G-SR
    Xcvr 3       REV 01   740-014279   AA0813N1RTG      XFP-10G-LR
  MMB 0          REV 04   710-010842   JN1971           ST-MMB
SPMB 0           REV 04   710-023321   DW3629           LCC Switch CPU
SPMB 1           REV 04   710-023321   DW3621           LCC Switch CPU
SIB 0            REV 07   710-022594   DW4200           LCC SIB
  B Board        REV 07   710-023185   DW3932           LCC SIB Mezz
SIB 1            REV 07   710-022594   DW4193           LCC SIB
  B Board        REV 07   710-023185   DW3904           LCC SIB Mezz
SIB 2
SIB 3            REV 07   710-022594   DW4210           LCC SIB
  B Board        REV 06   710-023185   DT5780           LCC SIB Mezz
SIB 4            REV 08   710-022594   DW8019           LCC SIB
```

```
  B Board        REV 06   710-023185   DT5795           LCC SIB Mezz
Fan Tray 0                                              Front Top Fan Tray
Fan Tray 1                                              Front Bottom Fan Tray
Fan Tray 2                                              Rear Fan Tray -- Rev 3
```

### show chassis hardware sfc (TX Matrix Plus Router)

```
user@host> show chassis hardware sfc 0
sfc0-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN112F007AHB      TXP
Midplane         REV 05   710-022574   TS4027            SFC Midplane
FPM Display      REV 03   710-024027   DX0282            TXP FPM Display
CIP 0            REV 04   710-023792   DW4889            TXP CIP
CIP 1            REV 04   710-023792   DW4887            TXP CIP
PEM 0            Rev 07   740-027463   UM26368           Power Entry Module
Routing Engine 0 REV 01   740-026942   737A-1064         SFC RE
Routing Engine 1 REV 01   740-026942   737A-1082         SFC RE
CB 0             REV 09   710-022606   DW6099            SFC Control Board
CB 1             REV 09   710-022606   DW6096            SFC Control Board
SPMB 0                    BUILTIN                        SFC Switch CPU
SPMB 1                    BUILTIN                        SFC Switch CPU
SIB F13 0        REV 04   710-022600   DX0841            F13 SIB
  B Board        REV 03   710-023431   DX0966            F13 SIB Mezz
SIB F13 1        REV 04   750-024564   DW5776            F13 SIB
  B Board        REV 03   710-023431   DW9028            F13 SIB
SIB F13 3        REV 04   750-024564   DW5762            F13 SIB
  B Board        REV 03   710-023431   DW9059            F13 SIB
SIB F13 4        REV 04   750-024564   DW5797            F13 SIB
  B Board        REV 03   710-023431   DW9041            F13 SIB
SIB F13 6        REV 04   750-024564   DW5770            F13 SIB
  B Board        REV 03   710-023431   DW9079            F13 SIB Mezz
SIB F13 7        REV 04   750-024564   DW5758            F13 SIB
  B Board        REV 03   710-023431   DW9047            F13 SIB
SIB F13 8        REV 04   750-024564   DW5761            F13 SIB
  B Board        REV 03   710-023431   DW9043            F13 SIB Mezz
SIB F13 9        REV 04   750-024564   DW5754            F13 SIB
  B Board        REV 03   710-023431   DW9078            F13 SIB Mezz
SIB F13 11       REV 04   710-022600   DX0826            F13 SIB
  B Board        REV 03   710-023431   DX0967            F13 SIB Mezz
SIB F13 12       REV 04   750-024564   DW5794            F13 SIB
  B Board        REV 03   710-023431   DW9044            F13 SIB Mezz
SIB F2S 0/0      REV 05   710-022603   DW7897            F2S SIB
  B Board        REV 05   710-023787   DW7657            NEO PMB
SIB F2S 0/2      REV 05   710-022603   DW7833            F2S SIB
  B Board        REV 05   710-023787   DW7526            NEO PMB
SIB F2S 0/4      REV 05   710-022603   DW7875            F2S SIB
  B Board        REV 05   710-023787   DW7588            NEO PMB
SIB F2S 0/6      REV 05   710-022603   DW7860            F2S SIB
  B Board        REV 05   710-023787   DW7589            NEO PMB
SIB F2S 1/0      REV 04   710-022603   DW4820            F2S SIB
  B Board        REV 05   710-023787   DW8510            NEO PMB
SIB F2S 1/2      REV 05   710-022603   DW7849            F2S SIB
  B Board        REV 05   710-023787   DW7525            NEO PMB
SIB F2S 1/4      REV 05   710-022603   DW7927            F2S SIB
  B Board        REV 05   710-023787   DW7556            F2S SIB Mezz
SIB F2S 1/6      REV 05   710-022603   DW7866            F2S SIB
  B Board        REV 05   710-023787   DW7651            NEO PMB
SIB F2S 2/0      REV 05   710-022603   DW7880            F2S SIB
  B Board        REV 05   710-023787   DW7523            NEO PMB
SIB F2S 2/2      REV 05   710-022603   DW7895            F2S SIB
```

```
  B Board        REV 05   710-023787   DW7591           NEO PMB
SIB F2S 2/4      REV 05   710-022603   DW7907           F2S SIB
  B Board        REV 05   710-023787   DW7590           NEO PMB
SIB F2S 2/6      REV 05   710-022603   DW7785           F2S SIB
  B Board        REV 05   710-023787   DW7524           NEO PMB
SIB F2S 3/0      REV 05   710-022603   DW7782           F2S SIB
  B Board        REV 05   710-023787   DW7634           NEO PMB
SIB F2S 3/2      REV 05   710-022603   DW7793           F2S SIB
  B Board        REV 05   710-023787   DW7548           NEO PMB
SIB F2S 3/4      REV 05   710-022603   DW7779           F2S SIB
  B Board        REV 05   710-023787   DW7587           NEO PMB
SIB F2S 3/6      REV 05   710-022603   DW7930           F2S SIB
  B Board        REV 05   710-023787   DW7505           NEO PMB
SIB F2S 4/0      REV 05   710-022603   DW7867           F2S SIB
  B Board        REV 05   710-023787   DW7656           NEO PMB
SIB F2S 4/2      REV 05   710-022603   DW7917           F2S SIB
  B Board        REV 05   710-023787   DW7640           NEO PMB
SIB F2S 4/4      REV 05   710-022603   DW7929           F2S SIB
  B Board        REV 05   710-023787   DW7643           NEO PMB
SIB F2S 4/6      REV 05   710-022603   DW7870           F2S SIB
  B Board        REV 05   710-023787   DW7635           NEO PMB
Fan Tray 0       REV 06   760-024497   DV7831           Front Fan Tray
Fan Tray 1       REV 06   760-024497   DV9614           Front Fan Tray
Fan Tray 2       REV 06   760-024502   DV9618           Rear Fan Tray
Fan Tray 3       REV 06   760-024502   DV9616           Rear Fan Tray
Fan Tray 4       REV 06   760-024502   DV7807           Rear Fan Tray
Fan Tray 5       REV 06   760-024502   DV7828           Rear Fan Tray
```

**show chassis hardware extensive (TX Matrix Plus Router)**

```
user@host> show chassis hardware extensive
sfc0-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number     Description
Chassis                                JN112F007AHB      TXP
 Jedec Code:   0x7fb0           EEPROM Version:    0x02
                                S/N:               JN112F007AHB
 Assembly ID:  0x052c           Assembly Version:  00.00
 Date:         00-00-0000       Assembly Flags:    0x00
 ID: TXP
 Board Information Record:
  Address 0x00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 I2C Hex Data:
  Address 0x00: 7f b0 02 ff 05 2c 00 00 00 00 00 00 00 00 00 00
  Address 0x10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x20: 4a 4e 31 31 32 46 30 30 37 41 48 42 00 00 00 00
  Address 0x30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  Address 0x70: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Midplane         REV 05   710-022574   TS4027            SFC Midplane
 Jedec Code:   0x7fb0           EEPROM Version:    0x01
 P/N:          710-022574       S/N:               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-1OC192-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-1OC192-SON-VSR
  PIC 3          REV 12   750-009553                     PC-4OC48-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-4OC48-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
SIB F2S 1/6      REV 03   710-022603   DV0079           F2S SIB
  B Board        REV 03   710-023787   DT9972           NEO PMB
SIB F2S 2/0      REV 03   710-022603   DV0100           F2S SIB
  B Board        REV 03   710-023787   DT9925           NEO PMB
SIB F2S 2/2      REV 03   710-022603   DV0050           F2S SIB
  B Board        REV 03   710-023787   DV0005           NEO PMB
SIB F2S 2/4      REV 03   710-022603   DV0097           F2S SIB
  B Board        REV 03   710-023787   DT9936           NEO PMB
Fan Tray 0       REV 02   760-024497   DR8286           Front Fan Tray
Fan Tray 1       REV 06   760-024497   DV9624           Front Fan Tray
Fan Tray 2       REV 02   760-024502   DR8259           Rear Fan Tray
Fan Tray 3       REV 02   760-024502   DR8270           Rear Fan Tray
Fan Tray 4       REV 02   760-024502   DR8284           Rear Fan Tray
Fan Tray 5       REV 06   760-024502   DV7813           Rear Fan Tray

lcc0-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number    Description
Chassis                                JN1101F27AHA     T1600
Midplane         REV 04   710-017247   RC5317           T Series Backplane
FPM GBUS         REV 10   710-002901   DS8197           T640 FPM Board
FPM Display      REV 01   710-021387   DS6433           T1600 FPM Display
CIP              REV 06   710-002895   DS1493           T Series CIP
PEM 0            Rev 08   740-017906   UD26601          Power Entry Module 3x80
SCG 0            REV 15   710-003423   DP5847           T640 Sonet Clock Gen.
SCG 1            REV 15   710-003423   DR0924           T640 Sonet Clock Gen.
Routing Engine 0 REV 01   740-026942   737F-1024        LCC RE
  ad0    3887 MB  SMART CF             2008110502B63E513E51 Compact Flash
```

```
  ad1   30533 MB  SAMSUNG MCBQE32G8MPP-0V SY814A1208     Disk 1
Routing Engine 1 REV 01   740-026942   737F-1024         LCC RE
  ad0    3887 MB  SMART CF             2008110500F9A8A8A8A8 Compact Flash
  ad1   30533 MB  SAMSUNG MCBQE32G8MPP-0V SY814A1076     Disk 1
CB 0             REV 05   710-022597   DV4264            LCC Control Board
CB 1             REV 03   710-022597   DP8558            LCC Control Board
FPC 0            REV 14   710-013037   DS9967            FPC Type 4-ES
  CPU            REV 08   710-016744   DS3989            ST-PMB2
  PIC 0          REV 12   750-013198   DL7506            1x Tunnel
  PIC 1          REV 12   750-013198   DL7505            1x Tunnel
  MMB 0          REV 01   710-025563   DS8524            ST-MMB2
  MMB 1          REV 01   710-025563   DS8373            ST-MMB2
FPC 1            REV 14   710-013037   DT0027            FPC Type 4-ES
  CPU            REV 09   710-016744   DS7684            ST-PMB2
  PIC 0          REV 12   750-013198   DL7512            1x Tunnel
  PIC 1          REV 12   750-013198   DL7498            1x Tunnel
  MMB 0          REV 01   710-025563   DS8494            ST-MMB2
  MMB 1          REV 01   710-025563   DS8436            ST-MMB2
SPMB 0           REV 04   710-023321   DV3867            LCC Switch CPU
SPMB 1           REV 02   710-023321   DP0238            LCC Switch CPU
SIB 0            REV 06   710-022594   DT8268            LCC SIB
  B Board        REV 06   710-023185   DT5791            LCC SIB Mezz
SIB 1            REV 06   710-022594   DT8261            LCC SIB
  B Board        REV 06   710-023185   DT5769            LCC SIB Mezz
SIB 2            REV 04   710-022594   DS2315            LCC SIB
  B Board        REV 06   710-023185   DT5788            LCC SIB Mezz
SIB 3            REV 06   710-022594   DT8253            LCC SIB
  B Board        REV 06   710-023185   DT5811            LCC SIB Mezz
SIB 4            REV 06   710-022594   DT8248            LCC SIB
  B Board        REV 06   710-023185   DT5812            LCC SIB Mezz
Fan Tray 0                                               Front Top Fan Tray
Fan Tray 1                                               Front Bottom Fan Tray
Fan Tray 2                                               Rear Fan Tray
```

## show chassis hardware models (TX Matrix Plus Router)

```
user@host> show chassis hardware models
sfc0-re0:
--------------------------------------------------------------------------
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:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number     FRU model number
Midplane         REV 03   710-017247   RC3765            CHAS-BP-T1600-S
FPM Display      REV 01   710-021387   DN5441            CRAFT-T1600-S
CIP              REV 06   710-002895   DP6021            CIP-L-T640-S
PEM 0            Rev 07   740-017906   UA26384           PWR-T1600-3-80-DC-S
PEM 1            Rev 07   740-017906   UA26296           PWR-T1600-3-80-DC-S
SCG 0            REV 15   710-003423   DR0875            SCG-T-S
CB 0             REV 06   710-022597   DW8534            CB-LCC
CB 1             REV 06   710-022597   DW8527            CB-LCC
FPC 4            REV 12   710-013037   DJ8717            T1600-FPC4-ES
  PIC 0          REV 11   750-017405   DP8795            PD-4XGE-XFP
  PIC 1          REV 11   750-017405   DP8794            PD-4XGE-XFP
FPC 6            REV 14   710-013037   DS5335            T1600-FPC4-ES
  PIC 0          REV 13   750-017405   DS7634            PD-4XGE-XFP
  PIC 1          REV 13   750-017405   DS7637            PD-4XGE-XFP
FPC 7            REV 07   710-013035   DM0990            T1600-FPC3-ES
  PIC 0          REV 16   750-007141   JJ8067            PC-10GE-SFP
  PIC 1          REV 08   750-015749   WE9598            PC-1OC192-SON-XFP
  PIC 2          REV 10   750-009450   HX6466            PC-1OC192-SON-SR2
SIB 0            REV 08   710-022594   DW8033            SIB-TXP-T1600-S
SIB 1            REV 08   710-022594   DW8044            SIB-TXP-T1600-S
SIB 2            REV 08   710-022594   DW8020            SIB-TXP-T1600-S
SIB 3            REV 08   710-022594   DW8063            SIB-TXP-T1600-S
SIB 4            REV 08   710-022594   DW8064            SIB-TXP-T1600-S
Fan Tray 0                                               FANTRAY-T-S
Fan Tray 1                                               FANTRAY-T-S
Fan Tray 2                                               FANTRAY-TXP-R-S

lcc1-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number     FRU model number
Midplane         REV 04   710-017247   RC5361            CHAS-BP-T1600-S
FPM Display      REV 01   710-021387   DS6430            CRAFT-T1600-S
CIP              REV 06   710-002895   DS4239            CIP-L-T640-S
PEM 0            Rev 08   740-017906   UD26649           PWR-T1600-3-80-DC-S
SCG 0            REV 15   710-003423   DP5820            SCG-T-S
```

```
CB 0             REV 06   710-022597   DW8523            CB-LCC
CB 1             REV 06   710-022597   DW8528            CB-LCC
FPC 4            REV 12   710-013037   DP8509            T1600-FPC4-ES
  PIC 0          REV 11   750-017405   DP8808            PD-4XGE-XFP
  PIC 1          REV 11   750-017405   DP7263            PD-4XGE-XFP
FPC 6            REV 14   710-013037   DS9961            T1600-FPC4-ES
  PIC 0          REV 13   750-017405   DS5532            PD-4XGE-XFP
  PIC 1          REV 13   750-017405   DS7639            PD-4XGE-XFP
FPC 7            REV 03   710-013035   DF5564            T1600-FPC3-ES
  PIC 0          REV 16   750-007141   JJ8063            PC-10GE-SFP
SIB 0            REV 08   710-022594   DW8035            SIB-TXP-T1600-S
SIB 1            REV 10   710-022594   DX7672            SIB-TXP-T1600-S
SIB 2            REV 08   710-022594   DW8060            SIB-TXP-T1600-S
SIB 3            REV 08   710-022594   DW8072            SIB-TXP-T1600-S
SIB 4            REV 08   710-022594   DW8043            SIB-TXP-T1600-S
Fan Tray 0                                               FANTRAY-T-S
Fan Tray 1                                               FANTRAY-T-S
Fan Tray 2                                               FANTRAY-TXP-R-S

lcc2-re0:
--------------------------------------------------------------------------
Hardware inventory:
Item             Version  Part number  Serial number     FRU model number
Midplane         REV 03   710-017247   RC3956            CHAS-BP-T1600-S
FPM Display      REV 01   710-021387   DN7030            CRAFT-T1600-S
CIP              REV 06   710-002895   DM3962            CIP-L-T640-S
PEM 0            Rev 08   740-017906   UD26519           PWR-T1600-3-80-DC-S
PEM 1            Rev 07   740-017906   UC26601           PWR-T1600-3-80-DC-S
SCG 0            REV 15   710-003423   DP0277            SCG-T-S
CB 0             REV 06   710-022597   DW8524            CB-LCC
CB 1             REV 06   710-022597   DW8536            CB-LCC
FPC 4            REV 12   710-013037   DR1194            T1600-FPC4-ES
  PIC 0          REV 11   750-017405   DP8811            PD-4XGE-XFP
  PIC 1          REV 11   750-017405   DP8823            PD-4XGE-XFP
FPC 5            REV 12   710-013037   DR1184            T1600-FPC4-ES
  PIC 1          REV 11   750-017405   DP4744            PD-4XGE-XFP
FPC 6            REV 12   710-013037   DN8622            T1600-FPC4-ES
  PIC 0          REV 14   750-012518   JY9924            PD-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:
--------------------------------------------------------------------------
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 SFP+ Optics [MX Series Routers])**

```
user@host> show chassis hardware
Hardware inventory:
    Item             Version  Part number  Serial number     Description
    Chassis                                JN112D865AFA      MX960
    Midplane         REV 03   710-013698   TS3339            MX960 Backplane
    FPM Board        REV 03   710-014974   WW6267            Front Panel Display

    PDM              Rev 03   740-013110   QCS12485026       Power Distribution
Module
    PEM 0           Rev 04   740-013682   QCS12434086       PS 1.7kW; 200-240VAC
 in
    PEM 1           Rev 04   740-013682   QCS1243408Z       PS 1.7kW; 200-240VAC
 in
    PEM 2           Rev 04   740-013682   QCS1243407X       PS 1.7kW; 200-240VAC
 in
    Routing Engine 0 REV 07   740-015113   9009009677        RE-S-1300
    Routing Engine 1 REV 07   740-015113   9009011510        RE-S-1300
    CB 0             REV 03   710-021523   XF0394            MX SCB
    CB 1             REV 03   710-021523   XF0550            MX SCB
    CB 2             REV 03   710-021523   XD7455            MX SCB
    FPC 4            REV 02   750-028467   JR6127            MPC M 16x 10GE
      CPU            REV 02   711-029089   JX0129            AS PMB
      PIC 0                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      PIC 1                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      PIC 2                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
      PIC 3                   BUILTIN      BUILTIN           4x 10GE(LAN) SFP+
    Fan Tray 0       REV 05   740-014971   TP9990            Fan Tray
    Fan Tray 1       REV 05   740-014971   VS1709            Fan Tray
```

**show chassis hardware (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 02   711-032234   EC4074           QFX 48x10G 4x40G Switch
```

```
  CPU                    BUILTIN     BUILTIN           FPC CPU
  PIC 0                  BUILTIN     BUILTIN           48x 10G-SFP+
  PIC 1                  BUILTIN     BUILTIN           15x 10G-SFP+
Power Supply 0   PSMI 2C  11-d65800   --                QFX PS 650W AC
Fan Tray
```

### 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           QFX 48x10G 4x40G Switch

  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 Switches)**

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 Switches)**

user@switch> **show chassis hardware node-device node1**

```
Routing Engine 0   BUILTIN      BUILTIN           QFX Routing Engine
node1            REV 05   711-032234   ED3694            QFX 48x10G 4x40G Switch

  CPU                     BUILTIN      BUILTIN           FPC CPU
  PIC 0                   BUILTIN      BUILTIN           48x 10G-SFP+
    Xcvr 8       REV 01   740-030658   AD0946A028B       SFP+-10G-USR
...
```

## show chassis in-service-upgrade

**Syntax** **show chassis in-service-upgrade**

**Release Information** Command introduced in Junos OS Release 9.0.

**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 515

**Output Fields** Table 52 on page 515 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 52: 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:<br>• **Online**—FPC is online and running.<br>• **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 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 197

**List of Sample Output** show chassis lccs on page 517

**Output Fields** Table 53 on page 517 lists the output fields for the **show chassis lccs** command. Output fields are listed in the approximate order in which they appear.

### Table 53: show chassis lccs Output Fields

| Field Name | Field Description |
|---|---|
| **Slot** | LCC slot number. |
| **State** | LCC status:<br>• **Online**—LCC is online and running.<br>• **Offline**—LCC is powered down.<br>• **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 switches 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 switches 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**



**Output Fields** Table 54 on page 519 lists the output fields for the **show chassis location** command. Output fields are listed in the approximate order in which they appear.

### Table 54: show chassis location Output Fields

| Field Name | Field Description |
|---|---|
| **country-code** | Country code information. |

Table 54: 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 (TX Matrix Plus Router)

```
user@host> show chassis location interface by-slot fpc 2 lcc 1
Global FPC: 10
```

### 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 Switches)**

```
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 (QFX Series)** show chassis mac-addresses
<interconnect-device *name*>
<node-group *name*>

**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 Release 11.1 for the QFX Series.

**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 switches 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 switches only) (Optional) Display the MAC addresses for the specified Node group.

scc—(TX Matrix routers only) (Optional) Display MAC addresses for the TX Matrix router (or switch-card chassis).

sfc *number*—(TX Matrix Plus routers only) (Optional) Display MAC addresses for the TX Matrix Plus router (or switch-fabric chassis).

**Required Privilege Level**

view

**List of Sample Output**

show chassis mac-addresses on page 523
show chassis mac-addresses (TX Matrix Router) on page 523
show chassis mac-addresses (TX Matrix Plus Router) on page 524
show chassis mac-addresses (QFX3500 Switches) on page 524
show chassis mac-addresses interconnect-device (QFabric Switches) on page 525
show chassis mac-addresses node-device (QFabric Switches) on page 525

**Output Fields**

Table 55 on page 523 lists the output fields for the **show chassis mac-addresses** command. Output fields are listed in the approximate order in which they appear.

### Table 55: show chassis mac-addresses Output Fields

| Field Name | Field Description |
|---|---|
| MAC address information | |
| **Public base address** | Base address of the MAC addresses allocated to this router or switch. |
| **Public count** | Number of allocated public addresses. |
| **Private base address** | Base address of the private MAC addresses allocated to this router or switch. |
| **Private count** | Number of allocated private addresses. |

## Sample Output

**show chassis mac-addresses**

```
user@host> show chassis mac-addresses
MAC address information
  Public base address   0:90:69:0:4:0
  Public count       1008
  Private base address   0:90:69:0:7:f0
  Private count       16
```

**show chassis mac-addresses (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 Switches)**

user@switch> **show chassis mac-addresses interconnect-device interconnect1**

```
MAC address information:
  Public base address     00:1f:12:30:9c:c0
  Public count            58
  Private base address    00:1f:12:30:9c:fa
  Private count           6
```

**show chassis mac-addresses node-device (QFabric Switches)**

user@switch> **show chassis mac-addresses nodet-device node1**

```
MAC address information:
  Public base address     02:00:09:02:00:00
  Public count            65471
  Private base address    02:00:09:02:ff:bf
  Private count           64
```

## show chassis network services

**Syntax** show chassis network services

**Release Information** Command introduced in Junos OS Release 9.4.

**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

**Output Fields** Table 56 on page 526 lists the output fields for the **show chassis network services** command. Output fields are listed in the approximate order in which they appear.

### Table 56: show chassis network services Output Fields

| Field Name | Field Description |
|---|---|
| **Network Services Mode** | Network services mode configured for the MX Series router:<br>• **IP**—IP Network Services mode.<br>• **Ethernet**—Ethernet Network Services mode.<br>• **enhanced-ip**—Enhanced IP Network Services mode<br>• **enhanced-ethernet**—Enhanced Ethernet Network Services mode |

### show chassis network services

```
user@host> show chassis network services
Network Services Mode: 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 Router)**

show chassis pic fpc-slot *slot-number* pic-slot *slot-number*
<all-members>
<local>
<member *member-id*>

**Syntax (QFX Series)**

show chassis pic
<interconnect-device *name* (fpc-slot *slot-number* | pic-slot *slot-number*)>
<node-device *name* 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 the QFX Series.

**Description**

Display status information about the PIC installed in the specified Flexible PIC Concentrator (FPC) and PIC slot.

**Options**

fpc-slot *slot-number*—Display information about the PIC in this particular FPC slot:

- On a TX Matrix router, if you specify the number of the T640 router by using the **lcc *number*** option (the recommended method), replace ***slot-number*** with a value from **0** through **7**. Otherwise, replace ***slot-number*** with a value from **0** through **31**.

  Likewise, on a TX Matrix Plus router, if you specify the number of the T1600 router by using the **lcc *number*** option (the recommended method), replace ***slot-number*** with a value from **0** through **7**. Otherwise, replace ***slot-number*** with a value from **0** through **31**. For example, the following commands have the same result:

  user@host> **show chassis pic fpc-slot 1 lcc 1 pic-slot 1**
  user@host> **show chassis pic fpc-slot 9 pic-slot 1**

- M120 routers only—Replace ***slot-number*** with a value from **0** through **5**.
- MX80 routers only—Replace ***slot-number*** with a value from **0** through **1**.
- 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**.
- 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 switches—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 switches 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**.

node-device *name*—(QFabric switches 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 switch, replace ***slot-number*** with 0 or 1.

**Required Privilege Level** view

**Related Documentation**

- request chassis pic on page 201

**List of Sample Output**

show chassis pic fpc-slot pic-slot on page 530
show chassis pic fpc-slot pic-slot (PIC Offline) on page 531
show chassis pic fpc-slot pic-slot (FPC Offline) on page 531

## Output Fields

Table 57 on page 529 lists the output fields for the **show chassis pic** command. Output fields are listed in the approximate order in which they appear.

### Table 57: show chassis pic Output Fields

| Field Name | Field Description |
|---|---|
| **Type** | PIC type. |
| **ASIC type** | Type of ASIC on the PIC. |
| **State** | Status of the PIC. State is displayed only when a PIC is in the slot.<br>• **Online**— PIC is online and running.<br>• **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.** |

### Table 57: show chassis pic Output Fields *(continued)*

| Field Name | Field Description |
|---|---|
| **PIC Port Information (MX960 Router Bidirectional Optics)** | Port-level information for the PIC.<br>• Port—Port number<br>• Cable type—Type of small form-factor pluggable (SFP) optical transceiver installed. Uplink interfaces display -U. Down link interfaces display -D.<br>• Fiber type—Type of fiber. SM is single-mode.<br>• Xcvr vendor—Transceiver vendor name.<br>• Xcvr vendor part number—Transceiver vendor part number.<br>  ◦ BX10-10-km bidirectional optics.<br>  ◦ BX40-40-km bidirectional optics.<br>  ◦ SFP-LX-40-km SFP optics.<br>• 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.<br>• Port—Port number.<br>• Cable type—Type of small form-factor pluggable (SFP) optical transceiver installed.<br>• Fiber type—Type of fiber: **SM** (single-mode) or **MM** (multimode).<br>• Xcvr vendor—Transceiver vendor name.<br>• Xcvr vendor part number—Transceiver vendor part number.<br>• 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 (MX960 Router Bidirectional Optics)**

```
user@host> show chassis pic fpc-slot 4 pic-slot 1
FPC slot 4, PIC slot 1 information:
  Type                             10x 1GE(LAN)
  State                            Online
  PIC version                  0.0
  Uptime                         18 days, 5 hours, 41 minutes, 54 seconds

PIC port information:
                          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 (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 (TX Matrix Plus Router)**

```
user@host> show chassis pic pic-slot 0 fpc-slot 8
lcc0-re0:
--------------------------------------------------------------------------
FPC slot 8, PIC slot 0 information:
  Type                               1x 10GE(LAN/WAN)
  State                              Online
  Uptime                           2 hours, 46 minutes, 23 seconds

PIC port information:
                          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 CHOC3 SONET CE SFP)**

```
user@host> show chassis pic fpc-slot 0 pic-slot 1
FPC slot 0, PIC slot 1 information:
  Type                             4x CHOC3 SONET CE SFP
  State                            Online
  PIC version                  1.3
  CPU load average               1 percent
  Interrupt load average         0 percent
  Total DRAM size              128 MB
  Memory buffer utilization     99 percent
  Memory heap utilization        4 percent
  Uptime                         1 day, 22 hours, 55 minutes, 37 seconds
  Internal Clock Synchronization   Normal

PIC port information:
                          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 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 Switches)**

```
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 pic-slot (QFabric Switch)**

```
user@switch> show chassis pic node-device node1 pic-slot 0
FPC slot node1, PIC slot 0 information:
  Type                               48x 10G-SFP+Builtin
  State                              Online
  Uptime                           2 hours, 52 minutes, 37 seconds

PIC port information:
                          Fiber                     Xcvr vendor
  Port  Cable type        type  Xcvr vendor         part number       Wavelength
  0     10GBASE SR        MM    SumitomoElectric    SPP5101SR-J3      850 nm
  1     10GBASE SR        MM    SumitomoElectric    SPP5101SR-J3      850 nm
  2     10GBASE SR        MM    SumitomoElectric    SPP5101SR-J3      850 nm
  3     10GBASE SR        MM    SumitomoElectric    SPP5101SR-J3      850 nm
  4     10GBASE SR        MM    SumitomoElectric    SPP5101SR-J3      850 nm
  5     10GBASE SR        MM    SumitomoElectric    SPP5101SR-J3      850 nm
  6     10GBASE SR        MM    SumitomoElectric    SPP5101SR-J3      850 nm
  7     10GBASE SR        MM    SumitomoElectric    SPP5101SR-J3      850 nm
  8     10GBASE SR        MM    SumitomoElectric    SPP5101SR-J3      850 nm
  9     10GBASE SR        MM    SumitomoElectric    SPP5101SR-J3      850 nm
  10    10GBASE SR        MM    SumitomoElectric    SPP5101SR-J3      850 nm
  11    10GBASE SR        MM    SumitomoElectric    SPP5101SR-J3      850 nm
  12    10GBASE SR        MM    SumitomoElectric    SPP5101SR-J3      850 nm
  13    10GBASE SR        MM    SumitomoElectric    SPP5101SR-J3      850 nm
  14    10GBASE SR        MM    SumitomoElectric    SPP5101SR-J3      850 nm
  15    10GBASE SR        MM    SumitomoElectric    SPP5101SR-J3      850 nm
```

```
16     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
17     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
18     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
19     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
20     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
21     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
22     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
23     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
24     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
25     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
26     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
27     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
28     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
29     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
30     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
31     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
32     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
33     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
34     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
35     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
36     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
37     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
38     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
39     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
40     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
41     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
42     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
43     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
44     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
45     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
46     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
47     10GBASE SR       MM    SumitomoElectric   SPP5101SR-J3      850 nm
```

## show chassis 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 538
show chassis power-ratings (Power Management Disabled) on page 538

**Output Fields** Table 58 on page 536 lists the output fields for the **show chassis power-ratings** command. Output fields are listed in the approximate order in which they appear.

### Table 58: 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:<br>• **Low Power**—Maximum number of low-power consumption tokens available for the router.<br>• **High Power**—Maximum number of high-power consumption tokens available for the router.<br>• **Heat**—Maximum number of heat tokens available for the router. |

### Table 58: show chassis power-ratings Output Fields *(continued)*

| Field Name | Field Description |
|---|---|
| **FPC** *number* | PIM slot number and power and heat information for the PIM in this slot:<br>• **Low Power**—PIM low-power consumption. The number of low-power tokens used by the PIM.<br>• **High Power**—PIM high-power consumption. The number of high-power tokens used by the PIM.<br>• **Heat**—The number of PIM heat dissipation tokens used by this PIM.<br>• **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:<br>NOTE: The **request chassis fpc** command has no effect on the status of the PIM slot.<br>◦ **OK**—The PIM in this PIM slot can be brought online.<br>◦ **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.<br>◦ **Empty**—No PIM is installed in the PIM slot.<br>◦ **Cfg offline**—The PIM cannot be brought online because the PIM slot has been disabled by the **set chassis fpc offline** command. |
| **Tokens Used** | Total number of low-power, high-power, and heat tokens used by the router:<br>• **Low Power**—The total number of low-power tokens used by the router.<br>• **High Power**—The total number of high-power tokens used by the router.<br>• **Heat**—Number of heat tokens used by the router.<br>• **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.<br>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. |

## 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

**Release Information** Command introduced in Junos OS Release 10.0

**Description** (MX Series 3D Universal EdgeRouters only) Display power limits and usage information for the AC or DC Power Entry Modules (PEMs).

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** This command has no options.

**Required Privilege Level** view

**Related Documentation**

- show chassis power sequence

**List of Sample Output**

show chassis power (MX960 Router with DC PEM) on page 540
show chassis power (MX960 Router with AC PEM) on page 541
show chassis power (MX480 Router with AC PEM) on page 542
show chassis power (MX240 Router with DC PEM) on page 542

**Output Fields** Table 59 on page 540 lists the output fields for the **show chassis power** command. Output fields are listed in the approximate order in which they appear.

### Table 59: show chassis power Output Fields

| Field Name | Field Description |
|---|---|
| **PEM** *number* | AC or DC PEM number on the chassis. The following output fields are displayed for the PEM:<br>• **State**—State of the PEM:<br>  ◦ **Online**—PEM is present in the slot and online.<br>  ◦ **Empty**—PEM is not present in the slot.<br>  ◦ **Present**—PEM is present in the slot, but not online.<br>• ***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).<br>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.<br>• **Capacity**—Actual power input capacity with maximum capacity displayed (in parentheses) in watts.<br>NOTE: The maximum capacity for AC and DC PEMs is:<br>◦ MX960 AC PEM—4100 W if two feeds are connected. 1700 W if one feed is connected.<br>◦ MX960 DC PEM—4100 W if two feeds are connected. 1700 W if one feed is connected.<br>◦ MX480 AC PEM—2520 W if it is high-line. 1450 W if it is low-line.<br>◦ MX480 DC PEM—2400 W if the DIP switch is off. 2600 W if the DIP switch is on.<br>◦ MX240 AC PEM—2520 W if it is high-line. 1450 W if it is low-line.<br>◦ MX240 DC PEM—2400 W if the DIP switch is off. 2600 W if the DIP switch is on.<br>• **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. |
| **System** | Overall power statistics for the system zone-wise:<br>• Zone *number*:<br>  ◦ **Capacity**—Maximum power capacity applicable for the zone, in watts.<br>  ◦ **Allocated power**—Actual capacity allocated for the zone, in watts, with remaining power displayed in parentheses.<br>  ◦ **Actual usage**—Actual power usage for the zone, in watts.<br>• **Total system capacity**—Cumulative power capacity of all the zones, in watts.<br>• **Total remaining capacity**—Difference between the **Total system capacity** and cumulative **Allocated power** of all the zones, in watts. |

## 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 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 544

**Output Fields** Table 60 on page 544 lists the output fields for the **show chassis psd** command. Output fields are listed in the approximate order in which they appear.

### Table 60: show chassis psd Output Fields

| Field Name | Field Description |
|---|---|
| **Slot Description** | PSD identification. |
| **State** | PSD status:<br>• **Online**—PSD is online and running.<br>• **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

**List of Sample Output**

show chassis redundancy feb on page 546
show chassis redundancy feb redundancy-group grp1 on page 546
show chassis redundancy feb redundancy-group grp0 errors on page 546

**Output Fields**

Table 61 on page 545 lists the output fields for the **show chassis redundancy feb** command. Output fields are listed in the approximate order in which they appear.

### Table 61: 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:<br>• **Online**—FEB is online and running.<br>• **Offline**—FEB is powered down. |
| **Priority** | (Standard and **redundancy-group** option) Status of FEB in the redundancy group: **Backup**, **Primary**, or null. |
| **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. |

### Table 61: show chassis redundancy feb Output Fields *(continued)*

| Field name | Field Description |
|---|---|
| Redundancy State | (Standard and **redundancy-group** option) Status of the FEB:<br>• **Active**—FEB is currently active.<br>• **Ready**—Backup FEB is ready for a switchover<br>• **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 FPC(s)      Redundancy state
    0        Online     Backup        5                     Active
    3        Online                   3                     Active
   5        Online     Primary                             Ready
Auto-failover:  Enabled
Switch-reason:  Switchover from CLI
```

**show chassis redundancy feb redundancy-group grp0 errors**

```
user@host> show chassis redundancy feb redundancy-group grp0 errors
Group: grp0
    FEB: 0    State: Online
        FPC 0 link OK
        Fabric plane 0 OK
        Fabric plane 1 OK
        Fabric plane 2 OK
        Fabric plane 3 OK
    FEB: 1    State: Online
        FPC 0 link OK
        Fabric plane 0 OK
```

```
    Fabric plane 1 OK
    Fabric plane 2 OK
    Fabric plane 3 OK
FEB: 2    State: Online
    FPC 2 link OK
    Fabric plane 0 OK
    Fabric plane 1 OK
    Fabric plane 2 OK
    Fabric plane 3 OK
FEB: 3    State: Online
    FPC 3 link OK
    Fabric plane 0 OK
    Fabric plane 1 OK
    Fabric plane 2 OK
    Fabric plane 3 OK
FEB: 4    State: Online
    FPC 4 link OK
    Fabric plane 0 OK
    Fabric plane 1 OK
    Fabric plane 2 OK
    Fabric plane 3 OK
FEB: 5    State: Online
    FPC 5 link OK
    Fabric plane 0 OK
    Fabric plane 1 OK
    Fabric plane 2 OK
    Fabric plane 3 OK
```

## show chassis routing-engine

**Syntax**

show chassis routing-engine
<bios | *slot*>

**Syntax (EX Series Switch)**

show chassis routing-engine
<*slot*>

**Syntax (TX Matrix Router)**

show chassis routing-engine
<bios | *slot*>
<lcc *number* | scc>

**Syntax (TX Matrix Plus Router)**

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 Router)**

show chassis routing-engine
<bios | *slot*>
<all-members>
<local>
<member *member-id*>

**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 the QFX Series.

**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 switches 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 switches 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 205


**List of Sample Output**


show chassis routing-engine (M5 Router) on page 551
show chassis routing-engine (M10 Router) on page 551
show chassis routing-engine (M20 Router) on page 551
show chassis routing-engine (M40 Router) on page 552
show chassis routing-engine (M120 Router) on page 552
show chassis routing-engine (M160 Router) on page 553
show chassis routing-engine (MX240 Router) on page 554
show chassis routing-engine (MX480 Router) on page 554
show chassis routing-engine (MX960 Router) on page 554
show chassis routing-engine (TX Matrix Router) on page 555
show chassis routing-engine lcc (TX Matrix Router) on page 556
show chassis routing-engine bios (TX Matrix Router) on page 556
show chassis routing-engine (TX Matrix Plus Router) on page 557
show chassis routing-engine lcc (TX Matrix Plus Router) on page 558
show chassis routing-engine bios (TX Matrix Plus Router) on page 559
show chassis routing-engine (QFX Series) on page 559


**Output Fields**

Table 62 on page 550 lists the output fields for the **show chassis routing-engine** command. Output fields are listed in the approximate order in which they appear.

## Table 62: 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. |
| **DRAM** | Total DRAM available to the Routing Engine's processor. |
| **Memory utilization** | Percentage of Routing Engine memory being used. |
| **CPU utilization** | Information about the Routing Engine's CPU utilization:<br>• **User**—Percentage of CPU time being used by user processes.<br>• **Background**—Percentage of CPU time being used by background processes.<br>• **Kernel**—Percentage of CPU time being used by kernel processes.<br>• **Interrupt**—Percentage of CPU time being used by interrupts.<br>• **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. |
| **Last reboot reason** | Reason for last reboot, including:<br>• **power cycle/failure**—Reboot due to the switching off of the power button behind the Routing Engine, not the power button on the chassis.<br>• **watchdog**—Reboot due to a hardware watchdog.<br>• **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.<br>• **power-button hard power off**—Reboot due to pressing of the power button.<br>• **misc hardware reason**—Reboot due to miscellaneous hardware reasons.<br>• **thermal shutdown**—Reboot due to the router or switch reaching a critical temperature at which pointit is unsafe to continue operations.<br>• **hard disk failure**—Reboot due to a hard disk failure.<br>• **reset from debugger**—Reboot due to reset from the debugger.<br>• **chassis control reset**—Reboot due to a chassis control reset.<br>• **bios auto recovery reset**—Reboot due to a BIOS auto-recovery reset.<br>• **could not be determined**—Reboot due to an undetermined reason.<br>• **Router rebooted after a normal shutdown**—Reboot due to a normal shutdown. |

Table 62: show chassis routing-engine Output Fields *(continued)*

| Field Name | Field Description |
|---|---|
| **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 (TX Matrix Router)**

```
user@host> show chassis routing-engine
scc-re0:
--------------------------------------------------------------------------
Routing Engine status:
  Slot 0:
    Current state                  Master
    Election priority              Master (default)
    Temperature                 34 degrees C / 93 degrees F
    CPU temperature             33 degrees C / 91 degrees F
    DRAM                      2048 MB
    Memory utilization          12 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     2 percent
      Interrupt                  0 percent
      Idle                      98 percent
    Model                          RE-4.0
    Serial ID                      P11123900153
    Start time                     2004-08-05 18:42:05 PDT
    Uptime                        9 days, 22 hours, 49 minutes, 50 seconds
    Last reboot reason             Router rebooted after a normal shutdown
    Load averages:                 1 minute   5 minute  15 minute
                                       0.00       0.08       0.07

lcc0-re0:
--------------------------------------------------------------------------
Routing Engine status:
  Slot 0:
    Current state                  Master
    Election priority              Master (default)
    Temperature                 33 degrees C / 91 degrees F
    CPU temperature             30 degrees C / 86 degrees F
    DRAM                      2048 MB
    Memory utilization          12 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     1 percent
      Interrupt                  0 percent
      Idle                      98 percent
    Model                          RE-3.0
    Serial ID                      210865700363
    Start time                     2004-08-05 18:42:05 PDT
    Uptime                        9 days, 22 hours, 48 minutes, 20 seconds
    Last reboot reason             Router rebooted after a normal shutdown
    Load averages:                 1 minute   5 minute  15 minute
                                       0.00       0.02       0.00
```

```
lcc2-re0:
--------------------------------------------------------------------------
Routing Engine status:
  Slot 0:
    Current state                  Master
    Election priority              Master (default)
    Temperature                 34 degrees C / 93 degrees F
    CPU temperature             35 degrees C / 95 degrees F
    DRAM                      2048 MB
    Memory utilization          12 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     2 percent
      Interrupt                  0 percent
      Idle                      98 percent
    Model                          RE-4.0
    Serial ID                      P11123900126
    Start time                     2004-08-05 18:42:05 PDT
    Uptime                        9 days, 22 hours, 49 minutes, 4 seconds
    Last reboot reason             Router rebooted after a normal shutdown
    Load averages:                 1 minute   5 minute  15 minute
                                       0.01       0.01       0.0
```

### show chassis routing-engine lcc (TX Matrix Router)

```
user@host> show chassis routing-engine 0 lcc 0
lcc0-re0:
--------------------------------------------------------------------------------
Routing Engine status:
  Slot 0:
    Current state                  Master
    Election priority              Master (default)
    Temperature                 33 degrees C / 91 degrees F
    CPU temperature             30 degrees C / 86 degrees F
    DRAM                      2048 MB
    Memory utilization          12 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     1 percent
      Interrupt                  0 percent
      Idle                      98 percent
    Model                          RE-3.0
    Serial ID                      210865700363
    Start time                     2004-08-05 18:42:05 PDT
    Uptime                        7 days, 22 hours, 49 minutes, 6 seconds
    Last reboot reason             Router rebooted after a normal shutdown
    Load averages:                 1 minute   5 minute  15 minute
                                       0.00       0.00       0.00
```

### show chassis routing-engine bios (TX Matrix Router)

```
user@host> show chassis routing-engine bios
scc-re0:
--------------------------------------------------------------------------
Routing Engine BIOS Version: V1.0.0
lcc0-re0:
--------------------------------------------------------------------------
Routing Engine BIOS Version: V1.0.17
lcc2-re0:
--------------------------------------------------------------------------
Routing Engine BIOS Version: V1.0.0
```

**show chassis routing-engine (TX Matrix Plus Router)**

```
user@host> show chassis routing-engine
sfc0-re0:
--------------------------------------------------------------------------
Routing Engine status:
  Slot 0:
    Current state                  Master
    Election priority              Master (default)
    Temperature                 27 degrees C / 80 degrees F
    CPU temperature             42 degrees C / 107 degrees F
    DRAM                      3327 MB
    Memory utilization          12 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     2 percent
      Interrupt                  0 percent
      Idle                      98 percent
    Model                          RE-TXP-SFC
    Serial ID                      737A-1024
    Start time                     2009-05-11 17:39:49 PDT
    Uptime                         3 hours, 45 minutes, 25 seconds
    Last reboot reason             Router rebooted after a normal shutdown.
    Load averages:                 1 minute   5 minute  15 minute
                                       0.00       0.00       0.00
Routing Engine status:
  Slot 1:
    Current state                  Backup
    Election priority              Backup (default)
    Temperature                 29 degrees C / 84 degrees F
    CPU temperature             43 degrees C / 109 degrees F
    DRAM                      3327 MB
    Memory utilization          11 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     0 percent
      Interrupt                  0 percent
      Idle                     100 percent
    Model                          RE-TXP-SFC
    Serial ID                      737A-1024
    Start time                     2009-05-11 17:08:54 PDT
    Uptime                         4 hours, 16 minutes, 52 seconds
    Last reboot reason             0x1:power cycle/failure

lcc0-re0:
--------------------------------------------------------------------------
Routing Engine status:
  Slot 0:
    Current state                  Master
    Election priority              Master (default)
    Temperature                 30 degrees C / 86 degrees F
    CPU temperature             43 degrees C / 109 degrees F
    DRAM                      3327 MB
    Memory utilization           9 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     2 percent
      Interrupt                  0 percent
      Idle                      98 percent
    Model                          RE-TXP-LCC
```

```
    Serial ID                       737F-1024
    Start time                      2009-05-11 17:40:32 PDT
    Uptime                          3 hours, 44 minutes, 51 seconds
    Last reboot reason              Router rebooted after a normal shutdown.
    Load averages:                  1 minute   5 minute  15 minute
                                        0.00       0.00       0.00
Routing Engine status:
  Slot 1:
    Current state                   Backup
    Election priority               Backup (default)
    Temperature                  30 degrees C / 86 degrees F
    CPU temperature              43 degrees C / 109 degrees F
    DRAM                       3327 MB
    Memory utilization            9 percent
    CPU utilization:
      User                        0 percent
      Background                  0 percent
      Kernel                      0 percent
      Interrupt                   0 percent
      Idle                      100 percent
    Model                           RE-TXP-LCC
    Serial ID                       737F-1024
    Start time                      2009-05-06 17:31:32 PDT
    Uptime                          5 days, 3 hours, 54 minutes, 19 seconds
    Last reboot reason              Router rebooted after a normal shutdown.
```

**show chassis routing-engine lcc (TX Matrix Plus Router)**

```
user@host> show chassis routing-engine 0 lcc 0
lcc0-re0:
--------------------------------------------------------------------------
Routing Engine status:
  Slot 0:
    Current state                   Master
    Election priority               Master (default)
    Temperature                  30 degrees C / 86 degrees F
    CPU temperature              43 degrees C / 109 degrees F
    DRAM                       3327 MB
    Memory utilization            9 percent
    CPU utilization:
      User                        0 percent
      Background                  0 percent
      Kernel                      2 percent
      Interrupt                   0 percent
      Idle                       98 percent
    Model                           RE-TXP-LCC
    Serial ID                       737F-1024
    Start time                      2009-05-11 17:40:32 PDT
    Uptime                          3 hours, 45 minutes, 26 seconds
    Last reboot reason              Router rebooted after a normal shutdown.
    Load averages:                  1 minute   5 minute  15 minute
                                        0.00       0.00       0.00
Routing Engine status:
  Slot 1:
    Current state                   Backup
    Election priority               Backup (default)
    Temperature                  30 degrees C / 86 degrees F
    CPU temperature              43 degrees C / 109 degrees F
    DRAM                       3327 MB
    Memory utilization            9 percent
    CPU utilization:
      User                        0 percent
      Background                  0 percent
```

```
      Kernel                         0 percent
      Interrupt                      0 percent
      Idle                         100 percent
    Model                              RE-TXP-LCC
    Serial ID                          737F-1024
    Start time                         2009-05-06 17:31:32 PDT
    Uptime                             5 days, 3 hours, 54 minutes, 59 seconds
    Last reboot reason                 Router rebooted after a normal shutdown.
```

**show chassis routing-engine bios (TX Matrix Plus Router)**

```
user@host> show chassis routing-engine bios
sfc0-re0:
--------------------------------------------------------------------------
    Routing Engine BIOS Version: V0.0.Z

lcc0-re0:
--------------------------------------------------------------------------
    Routing Engine BIOS Version: V0.0.N
```

**show chassis routing-engine (QFX Series)**

```
user@switch> show chassis routing-engine
Routing Engine status:
Slot 0:
Current state Master
Election priority Master (default)
DRAM 2820 MB
Memory utilization 49 percent
CPU utilization:
User 1 percent
Background 0 percent
Kernel 1 percent
Interrupt 0 percent
Idle 97 percent
Model QFX3500-48S4Q
Serial ID S/N ED3709
Uptime 3 days, 4 hours, 29 minutes, 42 seconds
Last reboot reason 0x200:chassis control reset
Load averages: 1 minute 5 minute 15 minute
0.37 0.26 0.19
```

## show chassis 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

**List of Sample Output** show chassis scb on page 561

**Output Fields** Table 63 on page 560 lists the output fields for the **show chassis scb** command. Output fields are listed in the approximate order in which they appear.

### Table 63: 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:<br>• **IP routes**—Number of IP routes known to the Internet Processor.<br>• **MPLS routes**—Number of MPLS routes known to the Internet Processor.<br>• **SRAM banks enabled**—Which SRAM banks are enabled.<br>• **SRAM size**—Size of SCB SRAM, in bytes.<br>• **SRAM used**—Amount of SRAM used, in bytes.<br>• **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 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 211
- request chassis sfm master switch on page 210

**List of Sample Output**

show chassis sfm (M160 Router) on page 563
show chassis sfm detail (M40e Router) on page 563
show chassis sfm detail (M160 Router) on page 564

**Output Fields**

Table 64 on page 562 lists the output fields for the **show chassis sfm** command. Output fields are listed in the approximate order in which they appear.

### Table 64: 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:<br>• **Online**—SFM is online and running.<br>• **Online-Standby** (M40e router only)—SFM is online, operating as Standby.<br>• **Offline**—SFM is powered down.<br>• **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 64: 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*>

**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** (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.

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**.

**Required Privilege Level** view

**Related Documentation**


- request chassis sib on page 212
- show chassis spmb sibs on page 578


**List of Sample Output**


show chassis sibs (T640 Router) on page 567
show chassis sibs (TX Matrix Router) on page 567
show chassis sibs (T1600 Router) on page 568
show chassis sibs (TX Matrix Plus Router) on page 568
show chassis sibs sfc (TX Matrix Plus Router) on page 569
show chassis sibs lcc (TX Matrix Plus Router) on page 570
show chassis sibs (M320 Router) on page 570


**Output Fields** Table 65 on page 566 lists the output fields for the **show chassis sibs** command. Output fields are listed in the approximate order in which they appear.

### Table 65: 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:<br>• **Activating**—SIB is coming online; this is a transitional state.<br>• **Deactivating**—SIB is going offline; this is a transitional state.<br>• **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.<br>• **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.<br>• **Online**—SIB is operational and running.<br>• **Offline**—SIB is powered down.<br>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.<br>• **Spare**—SIB is redundant and will move to active state if one of the working SIBs fails to pass traffic.<br>• **Empty**—No SIB is present.<br>• **Fault**—SIB is in an alarmed state in which the SIB's plane is not operational for one of the following reasons:<br>  ◦ Onboard fabric ASIC is not operational.<br>  ◦ Fiber-optic connector faults.<br>  ◦ FPC connector faults.<br>  ◦ SIB midplane connector faults.<br>• **Check**—SIB is in the **Check** state because of the following reasons:<br>  ◦ SIB is not inserted properly.<br>  ◦ 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.<br>  ◦ 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:<br>    ◦ 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 65: 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.<br><br>NOTE: For SIBs in the **Check** state, the output displays some additional information:<br><br>• 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 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 (0 destination errors)**.<br>• 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)**.<br><br>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**.<br><br>• **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.<br><br>NOTE: The **Connected**, **Disconnected**, and **SFC Error** states are only applicable to the SIBs on an LCC. |

## 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 (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 spmb

**Syntax** show chassis spmb

**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.

**Description** (T Series routers only) Display Switch Processor Mezzanine Board (SPMB) status information.

**Options** none—(TX Matrix and TX Matrix Plus 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.

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 212
- show chassis spmb sibs on page 578

**List of Sample Output**



**Output Fields** Table 66 on page 572 lists the output fields for the **show chassis spmb** command. Output fields are listed in the approximate order in which they appear.

### Table 66: show chassis spmb Output Fields

| Field Name | Field Description |
|---|---|
| **Slot** | SPMB slot number: **0** or **1**. |
| **State** | SPMB status:<br>• **Online**—SPMB is operational and running.<br>• **Offline**—SPMB is powered down. |
| **Total CPU Utilization (%)** | Total percentage of CPU being used by the SPMB processor. |
| **Interrupt CPU Utilization (%)** | Of the total CPU being used by the SPMB processor, the percentage being used for interrupts. |
| **Memory Heap Utilization (%)** | Percentage of heap space (dynamic memory) being used by the FPC processor. If this number exceeds 80 percent, there may be a software problem (memory leak). |
| **Buffer Utilization (%)** | Percentage of buffer space being used by the SPMB processor for buffering internal messages. |
| **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 lcc (TX Matrix Router)**

```
user@host> show chassis spmb lcc 0
lcc0-re0:
--------------------------------------------------------------------------
Slot 0 information:
  State                           Online
  Total CPU Utilization              0%
  Interrupt CPU Utilization          0%
  Memory Heap Utilization            0%
  Buffer Utilization                42%
  Start time:                     2004-08-05 18:43:38 PDT
  Uptime:                         8 days, 55 minutes, 52 seconds
```

**show chassis spmb scc (TX Matrix Router)**

```
user@host> show chassis spmb scc
scc-re0:
--------------------------------------------------------------------------
Slot 0 information:
  State                           Online
  Total CPU Utilization              1%
  Interrupt CPU Utilization          0%
  Memory Heap Utilization            0%
  Buffer Utilization                42%
  Start time:                     2004-08-05 18:43:37 PDT
  Uptime:                         8 days, 1 hour, 6 minutes, 51 seconds
```

**show chassis spmb (T1600 Router)**

```
user@host> show chassis spmb
Slot 0 information:
  State                           Online
  Total CPU Utilization              2%
  Interrupt CPU Utilization          0%
  Memory Heap Utilization            0%
  Buffer Utilization                24%
  Start time:                     2009-05-07 22:34:03 PDT
  Uptime:                         3 days, 4 hours, 14 minutes, 33 seconds
Slot 1 information:
  State                           Online - Standby
  Total CPU Utilization              0%
  Interrupt CPU Utilization          0%
  Memory Heap Utilization            0%
  Buffer Utilization                24%
  Start time:                     2009-05-07 22:34:02 PDT
  Uptime:                         3 days, 4 hours, 14 minutes, 34 seconds
```

**show chassis spmb sibs (T1600 Router)**

```
user@host> show chassis spmb sibs
Slot  State                 Uptime
 0    Check               3 days, 4 hours, 11 minutes, 59 seconds
 1    Disconnected        3 days, 4 hours, 12 minutes, 36 seconds
 2    Disconnected        3 days, 4 hours, 12 minutes, 26 seconds
```

```
 3    Disconnected       3 days, 4 hours, 12 minutes, 17 seconds
 4    Disconnected       3 days, 4 hours, 12 minutes, 8 seconds
```

**show chassis spmb (TX Matrix Plus Router)**

```
user@host> show chassis spmb
sfc0-re0:
--------------------------------------------------------------------------
Slot 0 information:
  State                            Online
  Total CPU Utilization              84%
  Interrupt CPU Utilization           0%
  Memory Heap Utilization             0%
  Buffer Utilization                 24%
  Start time:                      2009-05-11 01:25:20 PDT
  Uptime:                          46 minutes, 6 seconds
Slot 1 information:
  State                            Online - Standby
  Total CPU Utilization               0%
  Interrupt CPU Utilization           0%
  Memory Heap Utilization             0%
  Buffer Utilization                 24%
  Start time:                      2009-05-11 01:25:20 PDT
  Uptime:                          46 minutes, 6 seconds

lcc0-re1:
--------------------------------------------------------------------------
Slot 0 information:
  State                            Online - Standby
  Total CPU Utilization               0%
  Interrupt CPU Utilization           0%
  Memory Heap Utilization             0%
  Buffer Utilization                 24%
  Start time:                      2009-05-11 01:25:09 PDT
  Uptime:                          46 minutes, 24 seconds
Slot 1 information:
  State                            Online
  Total CPU Utilization               5%
  Interrupt CPU Utilization           0%
  Memory Heap Utilization             0%
  Buffer Utilization                 24%
  Start time:                      2009-05-11 01:25:08 PDT
  Uptime:                          46 minutes, 25 seconds

lcc1-re1:
--------------------------------------------------------------------------
Slot 0 information:
  State                            Online - Standby
  Total CPU Utilization               1%
  Interrupt CPU Utilization           0%
  Memory Heap Utilization             0%
  Buffer Utilization                 24%
  Start time:                      2009-05-11 01:25:09 PDT
  Uptime:                          46 minutes, 24 seconds
Slot 1 information:
  State                            Online
  Total CPU Utilization               5%
  Interrupt CPU Utilization           0%
  Memory Heap Utilization             0%
  Buffer Utilization                 24%
  Start time:                      2009-05-11 01:25:10 PDT
  Uptime:                          46 minutes, 23 seconds
```

```
lcc2-re1:
--------------------------------------------------------------------------
Slot 0 information:
  State                             Online - Standby
  Total CPU Utilization                0%
  Interrupt CPU Utilization            0%
  Memory Heap Utilization              0%
  Buffer Utilization                  24%
  Start time:                       2009-05-11 01:25:08 PDT
  Uptime:                           46 minutes, 25 seconds
Slot 1 information:
  State                             Online
  Total CPU Utilization                5%
  Interrupt CPU Utilization            0%
  Memory Heap Utilization              0%
  Buffer Utilization                  24%
  Start time:                       2009-05-11 01:25:10 PDT
  Uptime:                           46 minutes, 23 seconds

lcc3-re1:
--------------------------------------------------------------------------
Slot 0 information:
  State                             Online - Standby
  Total CPU Utilization                1%
  Interrupt CPU Utilization            0%
  Memory Heap Utilization              0%
  Buffer Utilization                  24%
  Start time:                       2009-05-11 01:25:10 PDT
  Uptime:                           46 minutes, 23 seconds
Slot 1 information:
  State                             Online
  Total CPU Utilization                5%
  Interrupt CPU Utilization            0%
  Memory Heap Utilization              0%
  Buffer Utilization                  24%
  Start time:                       2009-05-11 01:25:09 PDT
  Uptime:                           46 minutes, 24 seconds
```

### show chassis spmb lcc (TX Matrix Plus Router)

```
user@host> show chassis spmb lcc 2
lcc2-re1:
--------------------------------------------------------------------------
Slot 0 information:
  State                             Online - Standby
  Total CPU Utilization                0%
  Interrupt CPU Utilization            0%
  Memory Heap Utilization              0%
  Buffer Utilization                  24%
  Start time:                       2009-05-11 01:25:08 PDT
  Uptime:                           45 minutes, 18 seconds
Slot 1 information:
  State                             Online
  Total CPU Utilization                6%
  Interrupt CPU Utilization            0%
  Memory Heap Utilization              0%
  Buffer Utilization                  24%
  Start time:                       2009-05-11 01:25:10 PDT
  Uptime:                           45 minutes, 16 seconds
```

**show chassis spmb scc (TX Matrix Plus Router)**

```
user@host> show chassis spmb sfc 0
sfc0-re0:
--------------------------------------------------------------------------
Slot 0 information:
  State                             Online
  Total CPU Utilization               87%
  Interrupt CPU Utilization            0%
  Memory Heap Utilization              0%
  Buffer Utilization                  24%
  Start time:                       2009-05-11 01:25:20 PDT
  Uptime:                           43 minutes, 32 seconds
Slot 1 information:
  State                             Online - Standby
  Total CPU Utilization                0%
  Interrupt CPU Utilization            0%
  Memory Heap Utilization              0%
  Buffer Utilization                  24%
  Start time:                       2009-05-11 01:25:20 PDT
  Uptime:                           43 minutes, 32 seconds
```

**show chassis spmb sibs (TX Matrix Plus Router)**

```
user@host> show chassis spmb sibs
sfc0-re0:
--------------------------------------------------------------------------
Slot  State              Type          Uptime
 0    Online             SIB F13        1 hour, 18 minutes, 54 seconds
 1    Online             SIB F13        1 hour, 18 minutes, 45 seconds
 2    Invalid
 3    Online             SIB F13        1 hour, 20 minutes, 21 seconds
 4    Online             SIB F13        1 hour, 20 minutes, 18 seconds
 5    Invalid
 6    Online             SIB F13        1 hour, 19 minutes, 51 seconds
 7    Fault              SIB F13
 8    Online             SIB F13        1 hour, 19 minutes, 17 seconds
 9    Online             SIB F13        1 hour, 19 minutes, 13 seconds
10    Invalid
11    Online             SIB F13        1 hour, 17 minutes, 54 seconds
12    Online             SIB F13        1 hour, 17 minutes, 51 seconds
13    Invalid
14    Invalid
15    Invalid
0/0   Online             SIB F2S        1 hour, 18 minutes, 52 seconds
0/2   Online             SIB F2S        1 hour, 18 minutes, 51 seconds
0/4   Online             SIB F2S        1 hour, 18 minutes, 49 seconds
0/6   Online             SIB F2S        1 hour, 18 minutes, 48 seconds
1/0   Online             SIB F2S        1 hour, 20 minutes, 16 seconds
1/2   Online             SIB F2S        1 hour, 20 minutes, 15 seconds
1/4   Online             SIB F2S        1 hour, 20 minutes, 14 seconds
1/6   Online             SIB F2S        1 hour, 20 minutes, 13 seconds
2/0   Online             SIB F2S        1 hour, 19 minutes, 48 seconds
2/2   Online             SIB F2S        1 hour, 19 minutes, 47 seconds
2/4   Online             SIB F2S        1 hour, 19 minutes, 46 seconds
2/6   Online             SIB F2S        1 hour, 19 minutes, 44 seconds
3/0   Online             SIB F2S        1 hour, 19 minutes, 24 seconds
3/2   Online             SIB F2S        1 hour, 19 minutes, 22 seconds
3/4   Online             SIB F2S        1 hour, 19 minutes, 21 seconds
3/6   Online             SIB F2S        1 hour, 19 minutes, 20 seconds
4/0   Online             SIB F2S        1 hour, 18 minutes, 2 seconds
4/2   Online             SIB F2S        1 hour, 18 minutes
4/4   Online             SIB F2S        1 hour, 17 minutes, 58 seconds
4/6   Online             SIB F2S        1 hour, 17 minutes, 58 seconds
```

```
lcc0-re1:
--------------------------------------------------------------------------
Slot  State              Uptime
 0    Online            1 hour, 18 minutes, 58 seconds
 1    Online            1 hour, 20 minutes, 25 seconds
 2    Fault
 3    Online            1 hour, 18 minutes, 30 seconds
 4    Online            1 hour, 18 minutes, 28 seconds

lcc1-re1:
--------------------------------------------------------------------------
Slot  State              Uptime
 0    Online            1 hour, 18 minutes, 58 seconds
 1    Online            1 hour, 20 minutes, 26 seconds
 2    Fault
 3    Online            1 hour, 18 minutes, 22 seconds
 4    Online            1 hour, 18 minutes, 20 seconds

lcc2-re1:
--------------------------------------------------------------------------
Slot  State              Uptime
 0    Online            1 hour, 18 minutes, 19 seconds
 1    Online            1 hour, 20 minutes, 25 seconds
 2    Fault
 3    Online            1 hour, 18 minutes, 17 seconds
 4    Online            1 hour, 18 minutes, 15 seconds

lcc3-re1:
--------------------------------------------------------------------------
Slot  State              Uptime
 0    Online            1 hour, 18 minutes, 27 seconds
 1    Online            1 hour, 20 minutes, 24 seconds
 2    Fault
 3    Online            1 hour, 18 minutes, 25 seconds
 4    Online            1 hour, 18 minutes, 23 seconds
```

## show chassis spmb 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**

• request chassis spmb restart on page 218

**List of Sample Output**

show chassis spmb sibs (T320 Router) on page 579
show chassis-spmb-sibs (T1600 Router) on page 579
show chassis spmb sibs (TX Matrix Router) on page 580
show chassis spmb sibs lcc (TX Matrix Router) on page 580
show chassis spmb sibs scc (TX Matrix Router) on page 580
show chassis spmb sibs (TX Matrix Plus Router) on page 580
show chassis spmb sibs sfc (TX Matrix Plus Router) on page 581

**Output Fields** Table 67 on page 579 lists the output fields for the **show chassis spmb sibs** command. Output fields are listed in the approximate order in which they appear.

### Table 67: show chassis spmb sibs Output Fields

| Field Name | Field Description |
| --- | --- |
| **Slot** | SIB slot number:<br>• T640 router, T1600 router or TX Matrix router—**0** through **4**<br>• TX Matrix Plus router:<br>  ◦ TXP-F13 SIB Slots—**0** through **16**<br>  ◦ TXP-F2S SIB Slots —**0** – 4/[**0**\|**2**\|**4**\|**6**]<br>• T320 router—**0** through **2** |
| **State** | SIB status:<br>• **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.<br>• **Online**—SPMB is operational and running.<br>• **Offline**—SPMB is powered down.<br>• **Spare**—SIB is redundant and will move to active state if one of the working SIBs fail to pass traffic.<br>• **Empty**—No SPMB is present.<br>• **Fault**— SIB is in alarmed state where the SIB's plane is not operational for the following reasons:<br>  ◦ On-board F-chip is not operational.<br>  ◦ Fiber optic connector faults.<br>  ◦ FPC connector faults.<br>  ◦ SIB midplane connector faults.<br>• **Check**—SIB is in alarmed state where the SIB's plane is partially operational for the following reasons:<br>  ◦ SIB is not inserted properly.<br>  ◦ 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 (TX Matrix Router)**

```
user@host> show chassis spmb sibs
Slot  State
 0    Online
 1    Online
 2    Empty
 3    Online
 4    Offline
```

**show chassis spmb sibs lcc (TX Matrix Router)**

```
user@host> show chassis spmb sibs lcc 0
lcc0-re0:
--------------------------------------------------------------------------
Slot  State               Uptime
 0    Empty
 1    Empty
 2    Empty
 3    Disconnected        8 days, 48 minutes, 58 seconds
 4    Online              8 days, 48 minutes, 57 seconds
```

**show chassis spmb sibs scc (TX Matrix Router)**

```
user@host> show chassis spmb sibs scc
scc-re0:
--------------------------------------------------------------------------
Slot  State       Uptime
 0    Empty
 1    Empty
 2    Empty
 3    Offline
 4    Online             8 days, 54 minutes, 1 second
```

**show chassis spmb sibs (TX Matrix Plus Router)**

```
user@host> show chassis spmb sibs
sfc0-re0:
--------------------------------------------------------------------------
Slot  State              Type          Uptime
 0    Online             SIB F13        1 hour, 52 minutes, 55 seconds
 1    Empty
 2    Invalid
 3    Online             SIB F13        1 hour, 53 minutes, 3 seconds
 4    Empty
 5    Invalid
 6    Empty
 7    Empty
 8    Empty
 9    Empty
10    Invalid
11    Empty
12    Empty
13    Invalid
14    Invalid
15    Invalid
0/0   Online             SIB F2S        1 hour, 53 minutes, 2 seconds
0/2   Online             SIB F2S        1 hour, 53 minutes, 1 second
0/4   Online             SIB F2S        1 hour, 52 minutes, 59 seconds
0/6   Online             SIB F2S        1 hour, 52 minutes, 58 seconds
1/0   Online             SIB F2S        1 hour, 53 minutes, 10 seconds
1/2   Online             SIB F2S        1 hour, 53 minutes, 8 seconds
1/4   Online             SIB F2S        1 hour, 53 minutes, 7 seconds
```

```
1/6   Online            SIB F2S       1 hour, 53 minutes, 6 seconds
2/0   Empty
2/2   Empty
2/4   Empty
2/6   Empty
3/0   Empty
3/2   Empty
3/4   Empty
3/6   Empty
4/0   Empty
4/2   Empty
4/4   Empty
4/6   Empty

lcc0-re0:
--------------------------------------------------------------------------
Slot  State              Uptime
 0    Online            1 hour, 53 minutes, 1 second
 1    Online            1 hour, 53 minutes, 3 seconds
 2    Empty
 3    Empty
 4    Empty

lcc1-re1:
--------------------------------------------------------------------------
Slot  State              Uptime
 0    Online            1 hour, 47 minutes, 13 seconds
 1    Online            1 hour, 47 minutes, 15 seconds
 2    Empty
 3    Empty
 4    Empty
```

**show chassis spmb sibs sfc (TX Matrix Plus Router)**

```
user@host> show chassis spmb sibs sfc 0
sfc0-re0:
--------------------------------------------------------------------------
Slot 0 information:
  State                           Online
  Total CPU Utilization             16%
  Interrupt CPU Utilization          0%
  Memory Heap Utilization            0%
  Buffer Utilization                24%
  Start time:                     2009-06-17 20:59:47 PDT
  Uptime:                         1 hour, 56 minutes, 30 seconds
Slot 1 information:
  State                           Online - Standby
  Total CPU Utilization              0%
  Interrupt CPU Utilization          0%
  Memory Heap Utilization            0%
  Buffer Utilization                24%
  Start time:                     2009-06-17 20:59:48 PDT
  Uptime:                         1 hour, 56 minutes, 29 seconds
```

## show chassis synchronization

**Syntax**

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.

**Description**

(M320, M40e,M120, T320, T640, and T1600 routers 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 219

**List of Sample Output**

show chassis synchronization on page 583
show chassis synchronization master on page 583
show chassis synchronization backup on page 584
show chassis synchronization extensive on page 584
show chassis synchronization (T320, T640, and T1600 Routers) on page 584

**Output Fields**

Table 68 on page 582 lists the output fields for the **show chassis synchronization** command. Output fields are listed in the approximate order in which they appear.

### Table 68: show chassis synchronization Output Fields

| Field Name | Field Description |
|---|---|
| **Current state** | Indicates current status of external clock sources:<br>• **backup**—Source is currently the backup clock source.<br>• **master**—Source is currently the master clock source. |
| **Current clock state** | Indicates current source of external synchronization:<br>• **internal**—Source is providing its own clocking.<br>• **locked to master CB**—(M320, M40e, and M120 routers) Source is locked to master clock source.<br>• **locked to master SCG**—(T320, T640, and T1600 routers) Source is locked to master clock source. |
| **Selected for** | Number of seconds this clock has been the master or backup clock source. |

### Table 68: show chassis synchronization Output Fields *(continued)*

| Field Name | Field Description |
|---|---|
| **Selected since** | Time stamp 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 of clock sources eligible for selection as master clock. |
| **Source** | Information following concerns external source A or B. |
| **Priority** | Indicates priority of external clock sources:<br>• **primary**—Source is a primary reference.<br>• **secondary**—Source is a secondary reference. |
| **Deviation (in ppm)** | Current difference in clock timing, in ppm:<br>• **measuring**—Establishing source deviation.<br>• *number*—Deviation in ppm. |
| **Last deviation (in ppm)** | Previous difference in clock timing, in ppm:<br>• *number*—Deviation in ppm. |
| **Status** | Indicates status of external sources:<br>• **present**—Source is configured and present.<br>• **qualified**—Source is eligible for synchronization source. |

## Sample Output

**show chassis synchronization**

```
user@host> show chassis synchronization
Clock Synchronization Status :
  Clock module on CB 0
    Current state              : master
    Current clock state        : internal
      Selected for             : 18 hours, 12 minutes, 43 seconds
      Selected since           : 2008-09-10 03:27:47 PDT
      Deviation (in ppm)       : +0.00
      Last deviation (in ppm): +0.00
Clock Synchronization Status :
  Clock module on CB 1
    Current state              : backup
    Current clock state        : locked to master CB
      Selected for             : 1 day, 12 hours, 49 minutes, 20 seconds
      Selected since           : 2008-09-09 08:51:10 PDT
```

**show chassis synchronization master**

```
user@host> show chassis synchronization master
Clock Synchronization Status :
  Clock module on CB 0
    Current state              : master
    Current clock state        : internal
```

```
      Selected for          : 8 days, 21 minutes, 12 seconds
      Selected since        : 2008-08-27 21:05:40 PDT
      Deviation (in ppm)    : +0.00
      Last deviation (in ppm): +0.00
```

**show chassis synchronization backup**

```
user@host> show chassis synchronization backup
Clock Synchronization Status :
  Clock module on CB 1
    Current state           : backup
    Current clock state     : locked to master CB
      Selected for          : 34 days, 20 hours, 17 minutes, 8 seconds
      Selected since        : 2008-08-01 01:22:16 PDT
```

**show chassis synchronization extensive**

```
user@host> show chassis synchronization extensive
Clock Synchronization Status :
  Clock module on CB 0
    Current state           : master
    Current clock state     : internal
      Selected for          : 8 days, 36 minutes, 29 seconds
      Selected since        : 2008-08-27 21:05:40 PDT
      Deviation (in ppm)    : +0.00
      Last deviation (in ppm): +0.00
Clock Synchronization Status :
  Clock module on CB 1
    Current state           : backup
    Current clock state     : locked to master CB
      Selected for          : 34 days, 20 hours, 19 minutes, 53 seconds
      Selected since        : 2008-08-01 01:22:16 PDT
```

**show chassis synchronization (T320, T640, and T1600 Routers)**

```
user@host> show chassis synchronization
    Clock Synchronization Status :
      Clock module on SCG 0
        Current state           : master
        Current clock state     : locked to external-a
          Selected for          : 2 hours, 28 minutes, 4 seconds
          Selected since        : 2006-02-17 01:12:58 PST
        Configured sources
          Source      Priority   Deviation    Last deviation   Status
                                 (in ppm)     (in ppm)
          external-a  primary    measuring    -0.10            in-use
          external-b  secondary  -0.10        -0.10            qualified
    Clock Synchronization Status :
      Clock module on SCG 1
        Current state           : backup
        Current clock state     : locked to master SCG
          Selected for          : 19 hours, 49 minutes, 14 seconds
          Selected since        : 2006-02-16 07:51:48 PST
        Configured sources
          Source      Priority   Deviation    Last deviation   Status
                                 (in ppm)     (in ppm)
          external-a  primary    -0.25        -0.25            qualified
          external-b  secondary  -0.25        -0.25            qualified
```

## show chassis temperature-thresholds

**Syntax** show chassis temperature-thresholds

**Syntax (TX Matrix Router)** show chassis temperature-thresholds
<lcc *number* | scc>

**Syntax (TX Matrix Plus Router)** show chassis temperature-thresholds
<lcc *number* | sfc *number*>

**Syntax (MX Series Router)** show chassis temperature-thresholds
<all-members>
<local>
<member *member-id*>

**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 the QFX Series.

**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 switches 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 switches 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

**List of Sample Output**

show chassis temperature-thresholds on page 587
show chassis temperature-thresholds (TX Matrix Plus Router) on page 587
show chassis temperature-thresholds lcc (TX Matrix Plus Router) on page 588
show chassis temperature-thresholds sfc (TX Matrix Plus Router) on page 588
show chassis temperature-thresholds (QFX3500 Switch) on page 589
show chassis temperature-thresholds interconnect-device (QFabric Switch) on page 589

**Output Fields** Table 69 on page 586 lists the output fields for the **show chassis temperature-thresholds** command. Output fields are listed in the approximate order in which they appear.

## Table 69: 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** | Temperature threshold settings, in degrees Celsius, for the fans to operate at normal and high speeds.<br>• **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.<br>• **High**—The fans operate at high speed if the component has exceeded this temperature or a fan has failed or is missing.<br>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.<br>• **Normal**—The temperature that must be exceeded on the component to trigger a yellow alarm when the fans are running at full speed.<br>• **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.<br>• **Normal**—The temperature that must be exceeded on the component to trigger a red alarm when the fans are running at full speed.<br>• **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. |

## 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 (TX Matrix Plus Router)**

```
user@host> show chassis temperature-thresholds
sfc0-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
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 sfc (TX Matrix Plus Router)**

```
user@host> show chassis temperature-thresholds sfc 0
sfc0-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
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)

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
FPC Sensor TopLeft I       30     65        55      45        60      50
FPC Sensor TopRight I      30     65        55      45        60      50
FPC Sensor TopLeft E       30     65        55      45        60      50
FPC Sensor TopRight E      30     65        55      45        60      50
FPC Sensor TopMiddle I     30     65        55      45        60      50
FPC Sensor TopMiddle E     30     65        55      45        60      50
FPC Sensor Bottom I        30     65        55      45        60      50
FPC Sensor Bottom E        30     65        55      45        60      50
FPC Sensor Die Temp        30     65        55      45        60      50
FPC Sensor Mgmnt Brd I     30     65        55      45        60      50
```

### show chassis temperature-thresholds interconnect-device (QFabric Switch)

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
```

PART 4

# Index

# Index